
Green start-ups are the path towards sustainable development

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Abstract:

The aim of this study is to identify the emerging institutions that are addressing environmental issues due to technological advancements and increased number of institutions, while many countries and governments have implemented environmental frameworks and legislation, many still disregard them.

Besides, the green developing institutions that prioritize the environmental dimension in their activities and strive for sustainability were alluded to.

Definitely, the study yielded several findings, the most notable of which is that start-ups, particularly green ones, have emerged as a critical component of the market by inventing and introducing sustainable products. However, this represents the junction of technology, sustainability and entrepreneurship, and it is no longer just a fad; rather, it is a fundamental and unstoppable shift that will allow everyone to hope for a better future.

Key words: Green-start ups-sustainable development.

Introduction:

Nowadays, the world is more concerned with the environment than ever before, with a focus on reducing the depletion of environmental resources and industrial waste that has a negative impact on the environment, prompting countries and international organizations to promote the adoption of a green economy policy as an environmentally friendly economic activity.

In fact, start-ups are the backbone of most of the country's economies by contributing extensively to GDP growth and providing high levels of employment.

Green entrepreneurs deliver the source for beginning and sustaining a green economy by serving green products and services, presenting greener production techniques, enhancing demand for them, and building green jobs.

Further, Green institutions have become a model for newly established institutions, mainly start-ups, in order to achieve sustainable development. This coincided with the emergence of a clear interest from the Algerian State at the same time in start-ups and green institutions or the green economy.

In the face of growing global challenges, ranging from climate change to resource depletion and social inequality, the need for a green economy and, in particular, green start-ups has become more urgent than ever. The concept of green start-ups has emerged, aiming to introduce new products,

processes and practices that not only generate economic value, but also protect the environment and enable societies to address growing threats.

On the other hand, with their flexibility, creativity and risk-taking, start-ups occupy a unique and increasingly important position in achieving sustainable development, especially if they offer environmentally friendly products and are committed to preserving the environment in their operations. In contrast to established companies that often struggle with legacy systems and resistance to change, start-ups are agile, driven by a mission to disrupt and innovate. They are at the forefront of exploring and commercializing groundbreaking technologies and models that promise to transform industries and societies in sustainable ways. From harnessing renewable energy to pioneering zero-waste production methods and developing platforms that foster the sharing economy, start-ups are not only participating in the market; they are actively reshaping it to align with sustainability principles.

The problem of the study:

Accordingly, this study will answer the following question:

- ❖ What is the role of green start-ups in achieving sustainable development?

The importance of study:

Most importantly, the value of the study stems from the importance of the topic of start-ups in general and green start-ups in particular, given the role they play in achieving sustainable development for various countries, the latter of which have begun to attach great importance to this type of institution.

First: start-ups

Definition of start-up:

Start-ups have become an interesting field for researchers. However, their definition varies from researcher to another. Besides, some researchers classify them based on the novelty of their legal existence only, almost all studies conducted before the first decade of the twenty-first century use the word “new” as a basic criterion. For “**Cable**” (1976), for example, a start-up is “the creation of a completely new enterprise that did not previously exist as an organization”. As for “**Godgin**” (1978), a new firm is a firm that “has begun production for the first time.” Accordingly, the word “new” includes any firm that has been newly created in a given period of time, except those being created through changes in name, ownership, location or legal status. (Alahsan, 2021, p. 4)

Unquestionably, the most common and widely cited definition of start-ups is that of “**Steve Blank**”, a Silicon Valley entrepreneur and associate professor of entrepreneurship at Stanford University, who states that “a start-up is a temporary organization formed in search of a repeatable and scalable business model”; that is to say, “a start-up is not a small version of a large company, but a small company”. (skala, 2023, p. 15)

Start-up: it is an innovative company in new technologies. It emerges, innovates, evolves and revolutionizes. Above and beyond, creating a start-up means exploring, designing, taking risks and propelling innovation towards new horizons.

The importance of start-ups:

There is great importance for start-ups, economically and socially, as follows:

2.1. Economic importance:

Although start-ups are small and are exclusive to particular fields of production or services, they will dominate a large portion of the economic and financial turnover due to their multitude in the future. Therefore, the governments, organizations and major private companies throughout the world have been observing the activities, gathering and analyzing the data of the start-ups. (Hasani & al, 2014, p. 55)

From this perspective, the economic importance of emerging institutions became clear, as the following points can be pointed out:

- A- **Improvements in the industry (in products):** Start-ups lead to the development of more sectors in the agricultural, industrial, service, and technological fields, particularly in rural areas or areas where there are very few economic activities.
- B- **Increased productivity and economic growth:** Start-ups enable countries to produce more and more goods locally, which lead to an increase in the gross domestic product and thus contribute to enhancing economic growth.
- C- **Increase exports and reduce dependence on imports:** Start-ups contribute to creating new markets, and the more we produce, the more we can export products that are not locally sold. This means that start-up products can alike enter foreign markets.
- D- **Playing the role of feeding or complementary industries to large and medium industries:** Experience has shown that large institutions need small institutions, including start-ups, to implement many important tasks and activities for them, as these activities are very costly for large institutions if they are implemented by them.

2.2. Social importance:

- A- **Providing jobs and improving the standard of living:** The jobs created by start-ups lead to a fairer distribution of income, which results in higher living standards for the population.
- B- **Generating income and reducing social problems:** Successful start-up activities increase a person's income level, as well as the standard of living in the community, which also means that the crime rate, problems and social ills will decrease.
- C- **Personal challenge:** The difficulties faced by start-up business owners constitute a major challenge for them, so if they achieve the desired success, they will gain satisfaction and self-confidence, which motivates them to be creative.
- D- **Changing the structure of wealth concentration:** This means shifting from the concentration of wealth in the hands of a small group of individuals in society to a larger group, thus achieving economic stability.
- E- **Preventing brain drain abroad:** Entrepreneurship ensures the flow of money across all segments of society, especially among the educated and cultured, which encourages them to stay and develop themselves locally.

Start-ups in Algeria:

Actually, the Algerian authorities' interest in start-ups was somewhat late. As for the Algerian legislator, on September 15, 2020, it issued Executive Decree No. 20-254 relating to the establishment of the National Committee for the Brands of "Startups", "Innovative Brands" and "Incubators", and defining its tasks and method of operation. Article 11 of the decree stipulates that "a start-up is considered any institution subject to Algerian law, and respects the following criteria:

- The age of the establishment must not exceed 8 years, as the granting of the start-up label remains effective for 4 years and can then be renewed once for another four years;
- The business model of the start-up must be based on products, services, a business model or any innovative idea;
- The annual turnover must not exceed the amount determined by the National Commission;
- Its capital must be owned at least 50% by natural persons or investment funds, or by other institutions that have the name “start-up”;
- The company's capabilities must be large enough;
- The number of workers must not exceed 250 workers, as is the case with the ceiling for the number of workers in small and medium-sized enterprises;
- The institution must be subject to Algerian law, i.e., operate within Algerian territory.

Second: Green start-ups

Definition of Green start-ups:

We can start by stating that sustainable entrepreneurship is “an innovative, market-oriented, and personality-driven form of creating economic and social value through market or institutional innovations that are environmentally or socially beneficial.” It creates economic value through market activity and societal value through positive externalities or the reduction of negative externalities (Bergset & Fichter, 2015, p. 120). At this juncture, we see sustainable entrepreneurship as a specific form of entrepreneurship that meets three primary objectives: creating economic, environmental, and social value through sustainable innovation.

As for green start-ups, they are start-ups that have to meet three main objectives (economic, social, and environmental); therefore, their business activity focuses on products or services that have a positive environmental impact and contribute to achieving the environmental goals of the green economy. (Bergset & Fichter, 2015, p. 121)

Also, a green start-up is an early-stage company designed to grow fast and address an unmet market need by delivering value to customers. In all its operations, it considers and implements the use of sustainable resources, reduces resource consumption, promotes recycling and environmental benefits, and upholds socially responsible policies. (TRAU & al, 2022, p. 7)

In a consequence, we conclude from the previous definitions that green start-ups are institutions that are environmentally committed in all their marketing practices and in all the goods and products they manufacture, in short, establishing a friendly relationship between the institution and the environment. In virtue of which, these companies can operate in one of the following four areas:

- **Green Tech Start-ups:** Environmentally conscious entrepreneurs and start-ups are developing new technologies to address environmental issues, in respect such as water purification systems and air quality monitoring devices.

One useful sector classification in this regard is the “Environmental Goods and Services Sector” classification developed by Eurostat (2009), (Classification of Environmental Protection Activities CEPA) and (Classification of Resource Management Activities CReMA). Above and beyond, these classifications cover all activities that contribute to the following environmental objectives: renewable energy, energy efficiency, renewable resources, resource efficiency, circular economy, waste management, emission reduction

and climate protection, as well as biodiversity and ecosystems. (Bergset & Fichter, 2015, p. 122)

- **Sustainable Consumer Goods: Start-ups**, these companies focus on creating sustainable everyday products, in respect such as biodegradable packaging, eco-friendly cleaning supplies, and organic clothing.
- **Renewable Energy Start-ups**: These start-ups focus on harnessing renewable energy sources such as solar, wind, and hydropower. Hence, they aim to reduce our dependence on fossil fuels and decrease greenhouse gas emissions.
- **Green Services Start-ups**: These companies, such as those that are specialized in green transportation and green building services, aim to lessen their environmental footprint.

Steps for creating a green start-up:

1. Project idea: Many company ideas stem from an issue that the entrepreneur recognizes as a business opportunity.

If you want to be an eco-friendly entrepreneur, the first step is to identify a problem that you or the community you live in is facing and look for possible eco-friendly solutions that consider the environmental component as well as social and economic dimensions.

2. Preparing a business model plan: It is a plan that summarizes the value provided by the organization, the target customers, suppliers, the organization's main activities, and the revenue and cost structure. It is considered a mirror of the project that can be relied upon in developing the business plan.

3. Execution: It is not a one-off process; it involves cycles of testing, failing, learning, retesting, re-adjusting, and adapting based on the insights gained. In fact, the first solution is rarely the final solution. Instead, implementation is our opportunity to test, modify and improve our ideas.

Barriers to Going Green for Entrepreneurs:

Actually, there may be several reasons why businesses are reluctant to improve their environmental sustainability. However, going green may require significant investments in technology, innovation, market research and employee training.

Besides, many entrepreneurs do not see a direct demand from their customers to make their products more environmentally sustainable. As a result, they have doubts about whether these investments will pay off. Likewise, green entrepreneurs often face different types of uncertainty, in respect such as:

- **Technical uncertainty:** Entrepreneurs may not be sure of the technical feasibility, usefulness or functionality of the innovation they are going to create.
- **Market uncertainty:** Many green entrepreneurs build market demand for a product or service that has yet to exist and are unsure whether it will be as well received as expected.
- **Uncertainty about regulations and policies:** Green entrepreneurs find it difficult to predict what types of environmental regulations will be put in place and what type of political support will be available for green businesses in the medium term.

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- **Weak capabilities and competencies:** Small companies usually lack dedicated employees to care about the environmental aspects of the company; therefore, it is difficult for them to pay much attention thereto.
 - **Difficulty in obtaining environmental certification:** Once they have developed their environmentally safe products or services and implemented environmentally safe business practices, they want to obtain certification. In virtue of which, this aims to improve the environmental image of the organization with customers. For improvement purpose thereof, it is environmentally, socially and economically responsible. However, obtaining certification is considered expensive and difficult.

Third: Sustainable development

Although all countries, governments and even institutions seek to attain high levels of economic growth, this has shown not to be enough, as the economic, social and environmental aspects of any business are interconnected and none of the three aspects can be abandoned. Considering only one of these aspects at a time leads to errors in judgment and “unsustainable” results. Besides, focusing only on profit margins will gradually lead to social and environmental damage that costs society in the long run. Hence, the importance of the topic of sustainable development emerged, which can be defined as: “Sustainable development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. (Strange & Bayley, 2008, p. 24)

Similarly, sustainability is alike defined as a requirement for our generation to manage the resource base so that the average quality of life, we secure for ourselves, can be shared among future generations. (Asheim, May 1994, p. 4). In this regards, the dimensions of sustainable development are:

- **Environmental sustainability:** It prevents the use of nature as an inexhaustible source of resources and ensures the protection and rational use thereof. Above and beyond, environmental sustainability is achieved through: Preserving the environment, investing in renewable energy, providing water, supporting and developing sustainable mobility, and innovation in sustainable construction.
- **Social sustainability:** The development of people, communities and cultures to help achieving a fairly distributed quality of life, health care and education around the world.
- **Economic sustainability:** Focuses on economic growth that generates wealth for all, without harming the environment, investment and fair distribution of economic resources, together with combating poverty in all its forms.

Fourth: The role of green start-ups in sustainable development with reference to global experiences:

Start-ups rely heavily on technology, as they are based on creativity and innovation, which can only be achieved with advanced technology; however, this should not be at the expense of the environmental factor. Therefore, technology and environmental sustainability are interconnected, and it has become a duty for organizations to put sustainability at the centre of their business and technology strategies, and technology at the heart of their sustainability journey in order to survive and grow.

There is no doubt that emerging institutions, in order to succeed and achieve rapid growth, must rely primarily on technology, taking into account the environmental dimension. Hence, green emerging institutions have shown to be the best example thereof.

Benefits of entrepreneurs moving towards sustainability:

In addition to reducing negative environmental impact, sustainability is about creating positive long-term value. In this respect, companies that integrate sustainable practices into their operations benefit from the following:

- **Increased competitiveness:** Consumers increasingly prefer companies with strong sustainability credentials.
- **Reduced costs:** Implementing circular economy principles through adopting strategies that use resources more efficiently and reduce or reuse waste will ultimately have a positive impact on a company's finances.
- **Ability to cope with market changes:** As regulations evolve in response to growing environmental challenges, companies that are focused on sustainability are at the forefront and are therefore better equipped to adapt and thrive.
- **Easier access to green financing:** Investors are increasingly looking for impact-focused start-ups that are aligned with environmental and social standards.

Algerian and international experiences in the field of green start-ups:

This part of the research paper will illustrate some Algerian and international green start-ups.

1. Examples of green Algerian start-ups:

1.1. Aquayate:

Located in southern Algeria, the Foundation was launched in April 2022, Aquayte is known for its Spirulina cultivation and commitment to research and development to create innovative new products based on this microalgae. In addition to producing high-quality nutritional supplements, Aquayte is committed to continuously improving its agricultural and processing practices for the purpose of ensuring healthy and beneficial products.

According to one microbiologist, Spirulina is of great nutritional value, containing more protein (65% to 92% digestible protein), iron, beta-carotene, vitamin B12 and gamma-linolenic acid than any other known plant or animal food. Besides, "Spirulina is an alga with multiple health benefits". Likewise, it represents a raw material used in the preparation of semi-pharmaceutical products and food for aquaculture and pets, especially birds.

Consequently, Aquayte is considered the first institution in Algeria in this field, Aquayate has won several national awards, including 06th place at the "Algeria Start-up Challenge", distinguished itself at the "Tech-Boot-Camp" organized by the start-up incubator Brenco, and recently won 03rd place at the first edition of the annual Women Entrepreneurs Challenge, organized on the occasion of International Women's Rights Day in Algiers.

1.2. My-Tree Online:

It is an innovative digital platform whose core mission is to empower people to make a tangible impact on climate change by contributing to tree planting projects around the world, while benefiting from transparent and measurable results.

Nonetheless, one of its key principles is that planting billions of trees around the world is one of the biggest and cheapest ways to remove carbon dioxide from the atmosphere to address the climate crisis.

Additionally, new research estimates that a global tree-planting program could remove nearly a third of the human-caused emissions still in the atmosphere today, a figure scientists describe it as “astonishing.” (the guardian)

1.3. InstaClean:

InstaClean is an eco-friendly mobile car wash service that offers convenient, fast and environmentally responsible solutions. It ensures the following tasks:

- **Mobile car wash:** InstaClean travels directly to the customer’s location, whether at home, office or any other location of their choice. This mobile service eliminates the need for customers to visit a car wash, saving them valuable time.
- **Eco-friendly wash:** InstaClean uses an innovative washing method that requires only 10 liters of water to clean the car, compared to the hundreds of liters used in a regular car wash.

In fact, a traditional car wash requires up to 200 liters of water. In addition, the by-products of traditional car washes contain detergents, lead and enzymes that can reduce the safety of the water if they reach the water supply network. Therefore, traditional car wash methods have become negative from both an environmental and economic standpoint.

Besides, water has become a precious resource that we must conserve and not waste on simple things that do not require a lot of water, in respect such as washing cars.

2. Start-ups in the world:

There are many, if not thousands, of green start-ups around the world that are putting environmental sustainability at the top of their priorities, some of which can be mentioned as follows:

2.1. Treeapp:

Its idea is to enable anyone in the world to plant a tree using their phone in just one minute? In its first year, it planted 230,000 trees worldwide. Customers simply choose a reforestation project to support, and plant a tree, thanks to Treeapp’s partnerships with organizations around the world that are equally passionate about sustainability.

Using variable scaling equations and on-site data, the company aims to accurately calculate how much carbon is stored in forests over their lifetime. With Treeapp, you can track your carbon footprint as well as how many trees you need to plant to be carbon neutral.

2.2. Bluebird Climate:

Bluebird Climate aims to help brands around the world measure their sustainability practices to unlock partnership opportunities with other companies. Further, the company is particularly focused on the consumer products industry. Besides, Bluebird hopes to decarbonise the industry by giving consumer brands the ability to produce and market products that have little or no carbon emissions.

Additionally, global industry must decarbonise by reducing greenhouse gas emissions, particularly carbon dioxide (CO₂), across the supply chain. Further, ammonia, cement, ethylene and steel producers account for nearly half of industrial emissions. Other high-emission sectors include

food and tobacco, paper and printing and non-ferrous metals. Above and beyond, the construction industry is set to become the largest source of “consumption-based emissions” in the world’s largest cities, accounting for nearly a quarter of all emissions between now and 2050. In this respect, the International Energy Agency (IEA) stresses the importance of taking immediate action to avoid “trapped” emissions. However, this means that industry, energy and government must mobilize to align innovation, incentives and investment to support a carbon-free future.

2.3. Fuergy:

Founded in 2018 by “**Branislav Šafárek, Radoslaw Stumpf, Rastislav Koba and Vladimir Miskovsky**” in Slovakia, Fuergy aims to help accelerating the transition away from fossil fuels. Further, Fuergy focuses on providing alternative energy sources, as well as prioritizing making this transition as seamless and engaging as possible. In addition, the company has developed a highly scalable hardware and AI-powered software known as “**BrAIIn**” to optimize energy consumption and reduce energy costs for users.

Most importantly, thinking about developing modern strategies and technologies to rationalize energy consumption has become an imperative necessity in light of the increase in consumption resulting from the increase in population and the expansion of various industries, development projects and diverse activities, which results in an increase in the burden on energy production stations on the one hand and a decrease in the resources of this energy on the other hand, in particular non-renewable energies.

In order to avoid the exacerbation of the problem to the point where it is difficult to reach a solution sustainable, rationalization has become a duty through an integrated system that includes all devices and energy sources, the culture of society and raising awareness levels among its various segments with the effective contribution of the media, educational institutions, civil society and others, and this is a service to the continuation of the development process.

2.4. Entomo Farms:

In 2014, Canadian brothers “**Jarrold, Darren, and Ryan Goldin**” set out to change the food industry by creating products made from an unexpected protein—crickets. Further, their company, Entomo Farms, produces flour, snacks, pet food and protein powders packed with nutrients like protein, fibre and minerals. Besides, not only does their business model stand out from the competition, Entomo Farms’ products also help combat food waste and pollution and work toward a more sustainable future.

Certainly, food waste is a crime against humanity and the environment. In this regards, the amount of food wasted annually is huge, and leads to the waste of natural resources, increased greenhouse gas emissions, and exacerbates the problem of climate change, as well.

Consequently, addressing this problem requires the combined efforts of everyone, individuals, governments and companies, to change the behaviours of society, particularly Arab society, and its consumption habits.

2.5. AMP Robotics: Location Spokane, Washington

AMP Robotics, a recycling robot company, has pioneered AI technology that plays a pivotal role in enhancing the world’s recycling infrastructure. Above and beyond, this advanced technology accurately identifies and sorts recyclables, ensuring that all materials capable of being recycled are effectively utilized. In virtue of which, this innovation will not only decrease the amount of waste but also significantly streamline the recycling process.

Definitely, recycling is one of the most important environmental strategies that can contribute significantly to preserving the planet. However, the negative environmental impact on the environment can be reduced and economic and social benefits can alike be achieved, through reusing and recycling resources instead of disposing of them.

As consequence, the benefits of recycling include:

- **Reducing waste:** Recycling contributes significantly to reducing the amount of waste that ends up in landfills or is burned. Hence, this preserves the environment and reduces greenhouse gas emissions that contribute to climate change.
- **Conserving natural resources:** Through recycling, we can conserve natural resources such as minerals, wood and water. Therefore, it is a process that may eliminate or even reduce the consumption of resources.
- **Reducing energy consumption:** Recycling usually requires less energy compared to the production process using raw materials. Hence, this reduces carbon emissions and conserves fossil fuels.
- **Creating jobs:** Recycling can contribute to creating new jobs in the recycling and waste processing sector. These jobs include collection, sorting, processing and even marketing.

Conclusion:

Recently, many countries, including Algeria, have shown interest in start-ups, as they are certain of the effective economic and social role they play. What has been observed is the interest and efforts of entrepreneurs to attain the third dimension of sustainable development, which is the environmental dimension, as many of them are attracted to the ideas of environmentally friendly projects that consider the environmental dimension one of their priorities.

In the light of this study, the following points can be concluded:

- Start-ups, in particular green ones, are becoming a key player in the market by developing and bringing sustainable innovations to market.
- Green start-ups represent the intersection of technology, sustainability and entrepreneurship. Above and beyond, as they move steadily toward a more sustainable future, these start-ups will inspire a new generation of entrepreneurs to prioritize the environment over profit.
- The green entrepreneurship wave is not just a trend; it is a fundamental and inevitable shift that promises to redefine business in the 21st century.
- Environmental sustainability can help every human being hope for a better future, and green start-ups are taking action on green practices that will help everyone in the years to come.

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