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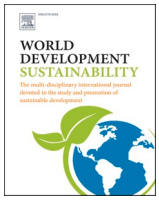

# Green entrepreneurship: Opportunities and challenges for the transition to a circular economy in Togo, West Africa

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ABSTRACT

The traditional linear economic model, characterized by extraction, production, consumption, and waste disposal, has increasingly exposed its limitations, particularly in the depletion of natural resources and the acceleration of global warming, which are critical global issues. These challenges inherent in the linear economy have prompted a shift towards a circular economy. This study analyzes the opportunities and challenges for transitioning to a circular economy through green entrepreneurship among 29 environmentally friendly entrepreneurs in Togo, West Africa. The descriptive analysis of the results revealed that green entrepreneurs are mainly motivated by economic factors, such as job creation and business opportunities, which take precedence over environmental motivations. However, they face significant challenges, including a lack of access to appropriate financing and complex administrative procedures that affect their growth. It is essential to develop themselves, provide specific support by alleviating bureaucratic obstacles to access to finance, and meet economic and environmental goals from green entrepreneurship. In addition, it's important to advocate for pro-environmental behavior among the general public and to support research and development to increase understanding of the advantages of promoting environmentally friendly entrepreneurship for sustainable development while combating climate change. Mainstreaming gender into circular economy policies design and implementation for sustainable development is crucial due to the low representativeness of women in green entrepreneurship. These measures will strengthen Togo's economic resilience while enabling the transition to a circular economy, thus aligning financial objectives with environmental preservation in pursuing green entrepreneurship.

## 1. Introduction

The Industrial Revolution in the 18th century brought about a significant economic upheaval, shifting the world from an economy based on agriculture and handicrafts to an industrial, mechanized economy. This linear economic model of extraction, production, consumption, and waste disposal has led to significant technical and scientific advancements [57,64]. However, this efficient system has gradually displayed its limitations by depleting natural resources and causing global warming, now one of the world's major concerns [6,42,48,56]. The rise of the consumer society has brought about a fundamental change in people's eating habits and lifestyles. People now associate well-being and comfort with abundant manufactured goods [46,74]. This trend has been fueled by increased purchasing power and rising living standards, leading manufacturers to adopt new forms of production. However, this has resulted in the production of large quantities of goods, leading to more waste, overexploitation, depletion of natural resources, and price volatility [6,40,47].

Faced with these environmental and economic problems, a shift towards more sustainable consumption and production practices that respect the ecosystem is becoming imperative [7,13]. This concern led to the emergence of the concept of sustainable development by the Brundtland Commission in 1987. This concept aims to reconcile economic, environmental, and social development, ensuring that current needs are met without compromising the ability of future generations to meet their own needs [47,66]. In this context, the foundations of a circular economy are beginning to emerge. The circular economy, which is part of this sustainable development dynamic, sees itself as an economic framework that promotes the conscious and efficient use of products and resources, favoring their recycling, their reintegration into the production cycle, and the preservation of their value over time [17,22,32]. This approach is of growing interest to researchers, practitioners, and

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policy-makers, as its implementation involves social, technological, institutional, and economic changes and contributes to the transition toward sustainability [36]. The circular economy thus opposes the traditional linear economic model by optimizing the use of material resources and reducing greenhouse gas emissions, waste, and pollution [31]. Specifically, this involves restructuring companies' energy and raw materials consumption, minimizing their use, extending the lifespan of products and components, promoting recycling, using non-toxic materials and renewable energies, and restoring natural ecosystems [20].

In the transition to a circular economy, green entrepreneurship has emerged as a significant concept in corporate strategy. Green entrepreneurship has gained momentum in the entrepreneurial landscape since the late 1990s [75]. By combining a robust entrepreneurial spirit with a heightened awareness of sustainability and environmental issues, green entrepreneurship promotes an environmental management approach to contribute to the implementation of the "4Rs" principle: reduce, reuse, repair, and recycle, thus supporting the principles of the circular economy [52,71]. Companies adopting circular economy practices can optimize their resources, reduce their carbon footprint, minimize waste, and contribute to environmental preservation [38,71]. Green entrepreneurship is thus a key element in the necessary change, significantly contributing to building a more resilient, balanced, and environmentally friendly circular economy. Moreover, the efforts of green entrepreneurship are essential to implementing circular practices in the economy.

Like most developing countries, Togo is exposed to the effects of climate change, a natural externality affecting the production, consumption, and development style system [15,48]. These changes, such as droughts, floods, and heat waves, threaten agriculture, one of the sectors most affected by climate change, employing around 60% of the working population [9]. According to World Bank data, agriculture's share of GDP has fallen from 37.4% in 2012 to 18.3% in 2022, a decline of almost 19% in ten years. This decline can be attributed to short-term shocks such as the COVID-19 pandemic, the Russo-Ukrainian war [8], and long-term effects, including environmental challenges. World Bank projections indicate that 100 million people, mainly in South Asia and sub-Saharan Africa, could fall back into poverty due to the effects of climate change [14,44]. Therefore, adopting and transitioning to a resilient economic model in sub-Saharan Africa, including Togo, is essential to address these imperative challenges [29]. The circular economy represents a sustainable economic model that could provide a lasting response to these challenges, including promoting sustainable development. Togo could greatly benefit from a circular economy, including reduced dependence on natural resources, better waste management, and sustainable development [23]. Furthermore, developing and promoting green entrepreneurship is paramount to effectively implementing the circular economy in Togo.

Thus, given the advantages of the circular economy, this study analyzes the opportunities and challenges for transitioning to a circular economy through green entrepreneurship in Togo. By examining how green entrepreneurship can drive the transition to a circular economy, this study offers crucial insights into combating the devastating effects of climate change, promoting diversified and sustainable economic development, improving public health, reducing dependence on natural resources, and reducing unemployment. Scientifically, it represents groundbreaking research that can guide policy-makers, researchers, and entrepreneurs in creating a more resilient and environmentally friendly future for Togo, in line with goals 12 (responsible consumption) and 13 (combating climate change) of the United Nations's sustainable development agenda.

In the subsequent sections, we will explore the theoretical foundations of the circular economy and green entrepreneurship (Section 2), followed by the methodological approach (Section 3). In section 4, we will present the results and discussion and succinctly conclude the paper by outlining the implications for economic policy in section 5.

## 2. Literature review

### 2.1. Motivations and obstacles faced by green entrepreneurs

Green motivation is the eco-entrepreneur's commitment to creating green value associated with profitable production. Some eco-entrepreneurs seek to maximize profits, others focus on maximizing green value, and others choose a combination. Two factors motivate eco-entrepreneurship: attractiveness factors and entrepreneurship-related factors [65]. Attractive factors such as unemployment, redundancies, and poor working conditions often have negative connotations that drive people towards entrepreneurial ideas. Attractiveness factors, on the other hand, are intrinsic and linked to individual choices before business creation, such as identifying a niche in the market, seeking greater autonomy, carrying out a satisfying activity, and contributing to the improvement of the ecosystem [10,39]. In short, eco-entrepreneurs are motivated to earn money while solving environmental problems. Furthermore, changing consumption patterns will lead to the emergence of green markets, creating new opportunities for green entrepreneurship [34].

While entrepreneurs face challenges in today's business environment, eco-entrepreneurs face even more significant obstacles. Environmental business ideas often struggle to create markets compared to non-environmental business ideas, and the financial world may not be mature enough to finance environmental innovations [27]. These entrepreneurs face several obstacles, with the first being the challenge of financing [61]. It is difficult for green entrepreneurs to obtain funding as the growth of green entrepreneurship and market penetration often take longer than traditional entrepreneurial activities. Thus, this can discourage investors who expect a faster return on investment [19,55].

Additionally, only some investors understand the green business market, and green entrepreneurs may need more financial knowledge, as emphasized by Malcolm et al. [41]. The second barrier is the lack of customer demand, which translates into a small market. Finally, green entrepreneurs may face a third barrier: their green products and services do not align with a company's image or core values [58].

### 2.2. Green entrepreneurship, a catalyst for a circular economy

The circular economy presents vast economic opportunities, with an estimated trillion, and offers significant social and environmental benefits [69]. Green entrepreneurship is crucial in promoting the circular economy, as innovative business models can fill the gap and provide essential links to businesses in reverse supply chains while creating new business opportunities with social benefits. Green product innovation is vital for growth and environmental sustainability in this new model [24]. Moving towards zero-waste production, design, reuse, and refurbishment requires innovation and new business models, which can be facilitated by green entrepreneurship. Large companies often need help to rate circular economy principles due to a lack of mandates, costs, logistical obstacles, and inertia. However, many companies are partnering with entrepreneurs to reduce waste and promote product reuse, motivated by sustainability commitments, zero waste goals, mandates, reputation, and local sourcing [69].

Mondal et al. [43] have highlighted the role of green entrepreneurs in promoting resource efficiency and waste reduction in the economy. They see green entrepreneurship as achieving environmental sustainability, a vital circular economy principle. By adopting innovative business models and practices, green entrepreneurs can contribute to reducing environmental pollution and conserving natural resources. Schaltegger and Wagner [59] also point out the potential of green entrepreneurship to facilitate the transition to a circular economy, arguing that green entrepreneurs can transform linear economic systems into circular ones by exploiting opportunities for sustainable innovation. York and Venkataraman [75] suggest that green entrepreneurs can leverage their unique capabilities to create value in a circular economy

by identifying and exploiting opportunities for resource efficiency and waste reduction and developing innovative solutions that disrupt traditional business models and sectors. In this way, they can encourage other companies to adopt the principles of the circular economy by successfully demonstrating the economic and environmental benefits of such an approach [63]. Green entrepreneurs are particularly well placed to put circular economy principles into practice.

### 2.3. State of circular economy entrepreneurship in Africa

The circular economy offers unique opportunities for sustainable development and green job creation [45]. As a result, several initiatives have been implemented to promote the transition to a circular economy. The global stage has seen the emergence of various endeavors driving the advancement of the circular economy. The *African Circular Economy Alliance* (ACEA) was established during COP 23 in 2017. Rwanda, South Africa, and Nigeria led this initiative to promote the principles of the circular economy at a continental scale [2]. In parallel, the *African Circular Economy Fund* (ACEF) was established to integrate the circular economy as an inclusive green growth strategy. This fund, financed by Finland's Ministry of Foreign Affairs and the Nordic Development Fund, aims to achieve the goals of the Paris Agreement, the SDGs, and the African Union Agenda 2063 while providing support for the creation of institutional frameworks and the private sector to facilitate the transition to a circular economy [3]. The campaign to combat single-use plastics, an important step forward in reducing plastic waste, was initiated at the continental level.

At the national level, several African countries have implemented policies to promote a circular economy. The *Nigeria Circular Economy Working Group* (NCEWG) platform is established to enable strategic stakeholder groups to come together, share ideas and experiences, and coordinate activities. The platform aims to break down silos and leverage economies of scale to inform circular economy policies and bankable projects at national and sub-national levels [4]. In 2008, Rwanda and Kenya imposed a ban on plastic bags, which was later extended to 2019, significantly reducing plastic pollution at the cost of reigniting economic challenges [16]. In 2024, Benin implemented a National Action Plan to cut greenhouse gas emissions and boost the use of renewable energy to support its circular economy [5]. Beyond its direct economic benefits, the circular economy offers numerous opportunities for green entrepreneurship in Africa [11]. In the field of waste management, companies such as *ENPRO* in Togo and *Wecyclers* in Nigeria are transforming waste collection and recycling into economic opportunities [51]. Start-ups like Hello Tractor in Kenya are promoting the optimal use of agricultural resources through technological innovation for sustainable agriculture [49]. Companies like *M-KOPA Solar* are democratizing access to solar energy in East Africa through the renewable energy sector [35]. Despite these advances, the circular economy in Africa faces several challenges, the scale of which may vary from country to country depending on public and private commitment to environmental sustainability. Low public awareness of the circular economy can also hamper its full deployment; hence, there is a need for such a study at the national level.

## 3. Research methodology

The choice of Greater Lomé as a study area for green entrepreneurship is justified by its dynamic urban environment and the environmental emergencies it faces. Located in the extreme southwest of Togo, Greater Lomé is the country's nerve center and concentrates most of its businesses, with 62.9% based in this region [72]. The high urban density presents significant environmental challenges, such as air pollution, waste management, and the degradation of natural resources. To collect the data, we conducted a two-stage survey. In the first stage, we obtained a database of green entrepreneurs from the Youth Economic Initiative Support Funds (FAIEJ). Alternatively, data were collected from green entrepreneurs who do not necessarily receive support from the Youth Economic Initiative Support Funds program. We used the non-probability "snowball" sampling technique to increase the sample significance. The snowball technique is particularly effective when the units to be surveyed are rare or when the data needed to determine the sample are not readily available [18]. This method involves soliciting those already identified to direct us toward other individuals or companies sharing the same characteristics [70]. This method allowed us to expand our sample progressively to cover 29 green entrepreneurs. According to Creswell [25], qualitative studies generally involve smaller sample sizes, as the aim is to gain an in-depth understanding rather than statistical generalizations.

In the second stage of our research, we employed a qualitative approach by conducting interviews with the Youth Economic Initiative Support Funds, the structure most promoted by the public authorities for supporting entrepreneurs in Togo. This approach allowed us to gather more subjective and contextualized information, focusing on the specific support provided to green entrepreneurs by this structure. The interviews provided an in-depth understanding of entrepreneurs' challenges, successes, and aspirations in green initiatives.

## 4. Results and discussion

### 4.1. Profile of green entrepreneurs

The profile of green entrepreneurs revealed from our field survey shows that 65% of the sample had a university education. The second largest category was those with a secondary education, accounting for 28%, while those with a primary education comprised 7% of the sample.

Fig. 1

Nearly two-thirds (65%) of green entrepreneurs sampled in our field survey had a university education, highlighting the importance of expertise, operational skills, and commitment to the environment in this complex field. The significant proportion of university-educated green entrepreneurs underscores the crucial role of higher education in shaping these entrepreneurs and providing them with cutting-edge skills and an innovative perspective on environmental issues. However, it is worth noting that 28% of green entrepreneurs in our sample had a secondary education, and 7% had a primary education, indicating that green entrepreneurship is accessible to individuals with less formal educational backgrounds. While university-educated individuals may have access to advanced knowledge and technologies, success in green entrepreneurship is not limited to them.

Fig. 2

With 79% men compared to just 21% women, it is clear that the latter are under-represented in this field. This gender bias can be seen as a reflection of the social norms and prejudices that have historically restricted women's access to entrepreneurial opportunities. Indeed, scientific literature highlights a persistent problem of under-representation of women in green entrepreneurship worldwide. According to a study by Brush et al. [21], women entrepreneurs face specific challenges, such as limited access to the networks, mentors, and funding needed to engage in green activities. In addition, gender stereotypes and socio-cultural norms are significant barriers to women's engagement in sustainable entrepreneurship [73]. Furthermore, Orser et al. [50] revealed that the need for more female role models in these sectors deters many women from getting involved. Thus, it indicates the need for targeted policies and programs to remove structural and cultural barriers to women's participation in green entrepreneurship for successful climate change mitigation policies [28].

### 4.2. Profile of green companies

The data on green entrepreneurs' activity fields is a diverse and promising picture of green entrepreneurship. The recycling sector accounts for 48.28% of green entrepreneurs, and this prevalence

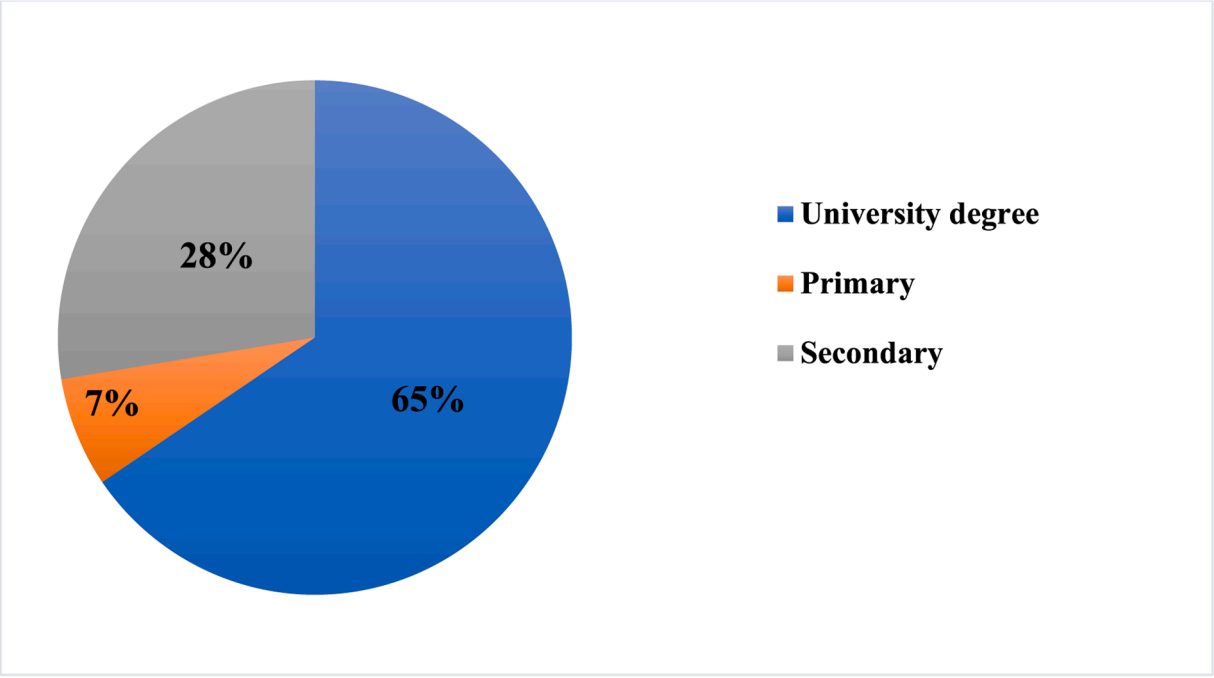


**Fig. 1.** Education level of green entrepreneurs.
**Source:** Authors, based on field surveys, June 2023

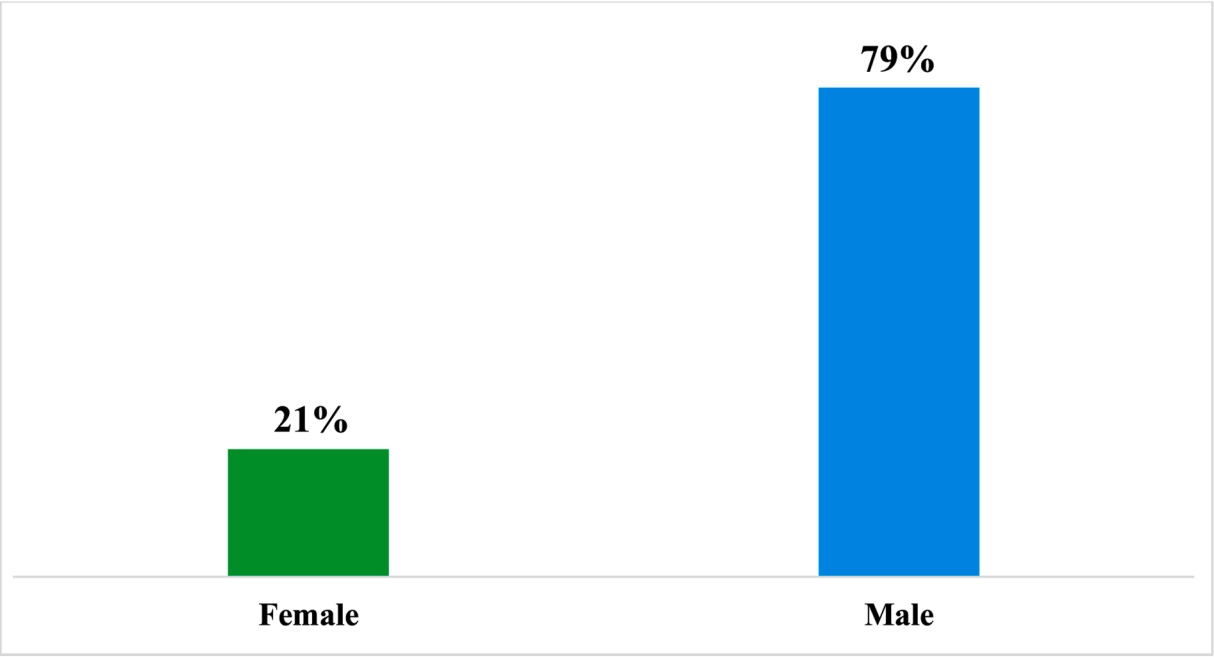


**Fig. 2.** Gender breakdown of green contractors.
**Source:** Authors, based on field surveys, June 2023

emphasizes the crucial importance of recycling in reducing waste, conserving resources, promoting a circular economy, and addressing the high proliferation of garbage in Greater Lomé. Additionally, organic farming and renewable energies occupy significant positions with 17.24% each, highlighting the shift towards sustainable agricultural practices and the energy transition. The 10.34% of green entrepreneurs committed to waste management also underscores the commitment to more efficient, environmentally friendly processing methods. Reconditioning is still in its infancy, with only 3.9% of green contractors involved.

Fig. 3

### 4.3. *Entrepreneurial motivations*

The motivations that underpin the development of entrepreneurial initiatives with an environmental vocation play a crucial role in the profitability and longevity of these businesses. Fuller et al. [30] noted that these motivations are subjective and closely linked to the

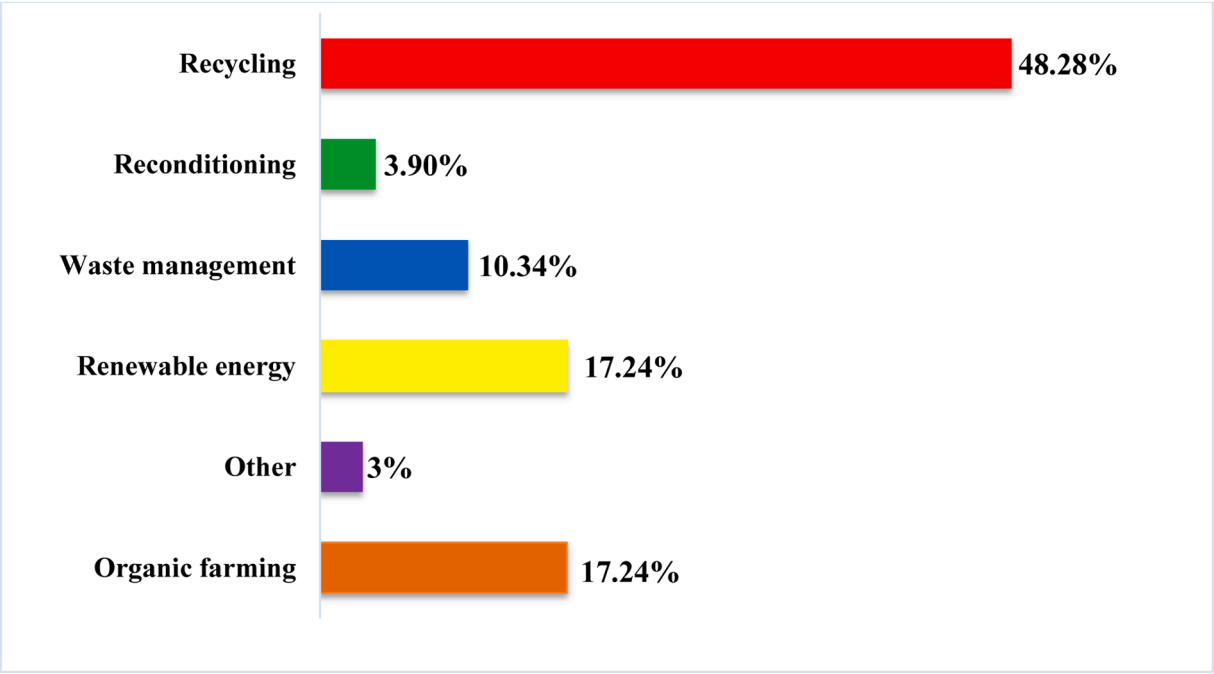


**Fig. 3.** Breakdown of green companies by business sector.
**Source:** Authors, based on field surveys, June 2023

entrepreneur's personality and socio-economic context. This analysis outlines entrepreneurs' motivations to engage in green-oriented entrepreneurial approaches, providing an informed perspective on their specific motivations.

Fig. 4 in the previous text provides insight into the motivations of green entrepreneurs in Togo. Most green entrepreneurs are motivated by the opportunity for business growth (30.9%). In comparison, others are driven by the desire to contribute to environmental protection (20.8%), improve the quality of life (20.8%), and create sustainable employment (26.5%) in an environmentally responsible manner.

Green entrepreneurs in Togo create profitable businesses and take a broader perspective. They generate employment opportunities within the nascent green sector, promoting more inclusive economic growth and improving social well-being. The analysis of the motivations of

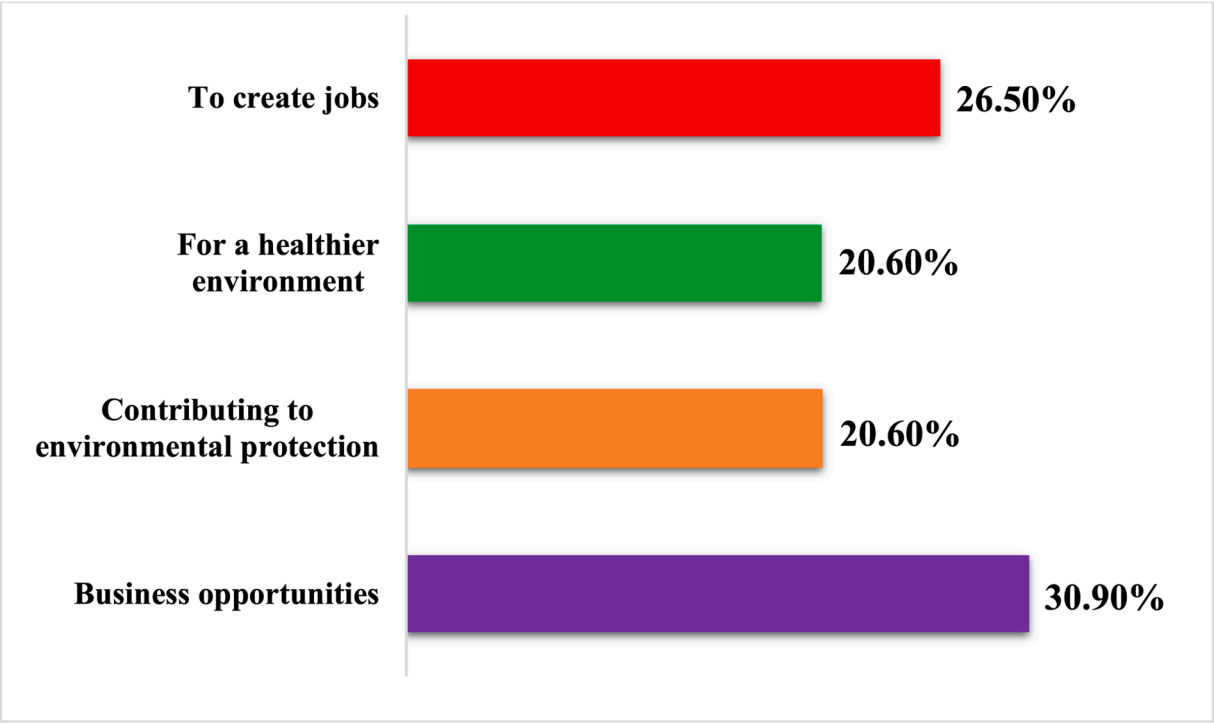


**Fig. 4.** Green entrepreneurs' motivation for setting up their businesses.
**Source:** Authors, based on field surveys, June 2023

green entrepreneurs in Togo echoes a phenomenon observed in the work of many sustainable entrepreneurship researchers. According to authors such as Schaltegger and Wagner [59], balancing economic and environmental motivations is often delicate. Their research suggests that green entrepreneurs are usually driven by immediate economic considerations, such as job creation and profitability while aspiring to broader environmental goals.

Furthermore, research suggests that green entrepreneurs in developing countries like Togo are more likely to prioritize economic benefits due to financial pressures and the need to maintain their commercial viability [68]. It could explain why economic motivations are emphasized among green entrepreneurs in Togo. However, it is essential to note that green entrepreneurs often transition from an economic orientation to one more focused on environmental goals [60]. This transition can be facilitated by increased awareness of environmental issues and understanding the long-term benefits of a sustainable approach. Additionally, 45% of the surveyed entrepreneurs were previously unemployed, and 35% were students, which may explain their focus on economic motivations and invalidate our initial hypothesis.

The emphasis on economic versus environmental motivations among green entrepreneurs in Togo aligns with the broader perspective on sustainable entrepreneurship. This dichotomy is frequently observed in the literature and may change as ecological awareness and market opportunities evolve. These findings support the paradox studied by Greenstone and Jack [33]. However, it is possible to reconcile these motivations and create successful green businesses that contribute to the local economy and environmental sustainability by increasing population awareness of environmental values while reducing communities' skepticism of environmental policy implementation [41,54]. Having examined the various motivations of eco-entrepreneurs, we must shift our attention to the multiple constraints they face.

### 4.4. *The constraints of green entrepreneurship*

The transition to more environmentally friendly and sustainable practices is a global necessity, and entrepreneurs who prioritize eco-friendly goals while achieving economic success are vital contributors to this movement [1]. However, despite their essential role, green entrepreneurs often need help establishing and maintaining their businesses. These constraints include financial and non-financial barriers.

Analyzing green entrepreneurs' financial constraints in Togo reveals similarities with problems in other sustainable entrepreneurship contexts. Vasilescu et al. [68] have pointed out that access to finance remains a significant concern for green entrepreneurs, particularly in developing economies. Green businesses, whose economic and environmental aspirations are intimately linked, often face challenges related to investor uncertainty about returns and the risks associated with emerging environmental technologies [37]. In addition, their work highlights how the economic context and limited availability of financing tailored explicitly to green businesses in developing economies can lead to inequalities in terms of access to capital. These findings are consistent with our survey results, where 79.3% of green entrepreneurs identified access to finance as a significant constraint, while 20.7% reported a restricted market.

Fig. 5

In Togo, the financial constraints faced by green entrepreneurs can be worsened due to the need for more financing sources designed explicitly for green businesses. Conventional financial institutions may need the necessary tools to adequately evaluate the risks and opportunities associated with environmental projects. Consequently, green entrepreneurs can get trapped in a vicious cycle where insufficient funding constrains their ability to expand their activities and demonstrate their economic and ecological viability. Nonetheless, it is crucial to note that some green entrepreneurs have overcome these constraints by exploring alternative solutions. For example, they may collaborate with international development organizations, seek impact financing, or network to access financial resources and advice. Government policies and tax incentives can also be significant factors in ameliorating green businesses' financial obstacles.

Fig. 6

Identifying non-financial challenges green entrepreneurs face is crucial for sustainable development and circular economy growth. Our analysis highlights the main non-financial constraints identified by green entrepreneurs, with the challenge of finding partners being predominant and identified by almost 43.60% of respondents. These results underscore the importance of cross-sector alliances in the Togolese entrepreneurial landscape. Partnerships can play a decisive role in sharing the resources, knowledge, and skills needed for the growth of green entrepreneurs, as identified by Silajdžić et al. [62]. Regulatory complexity is also a fundamental challenge for green businesses, as mentioned by 25.60% of green entrepreneurs in our survey. Adapting to complex regulatory frameworks in Togo may require agile strategies to navigate this landscape effectively.

On the other hand, the challenge of a lack of skilled human resources,

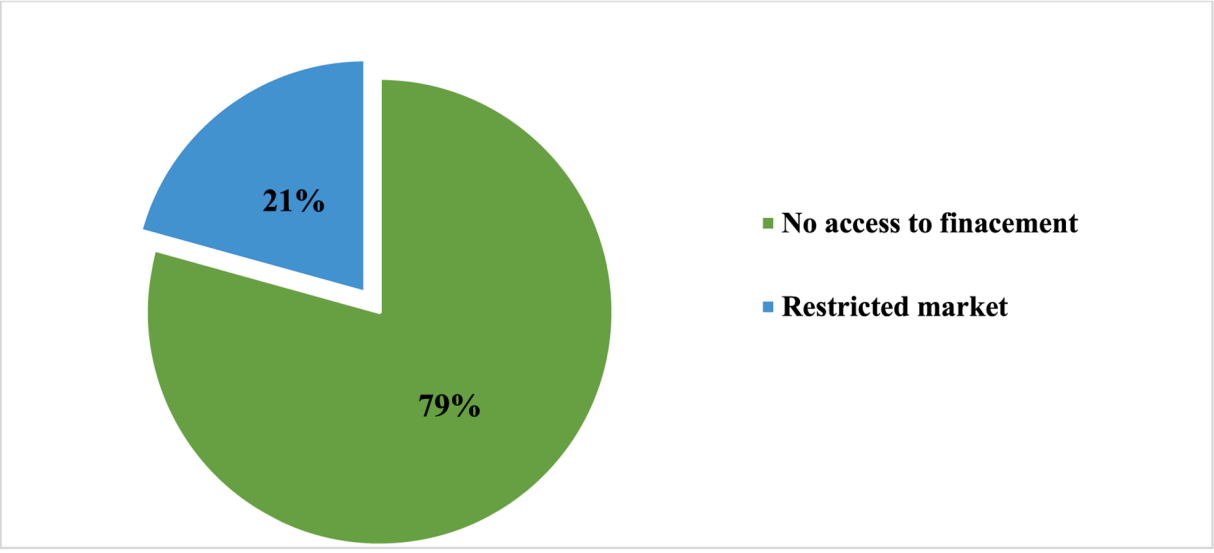


**Fig. 5.** Financial constraints for green contractors.
**Source:** Authors, based on field surveys, June 2023

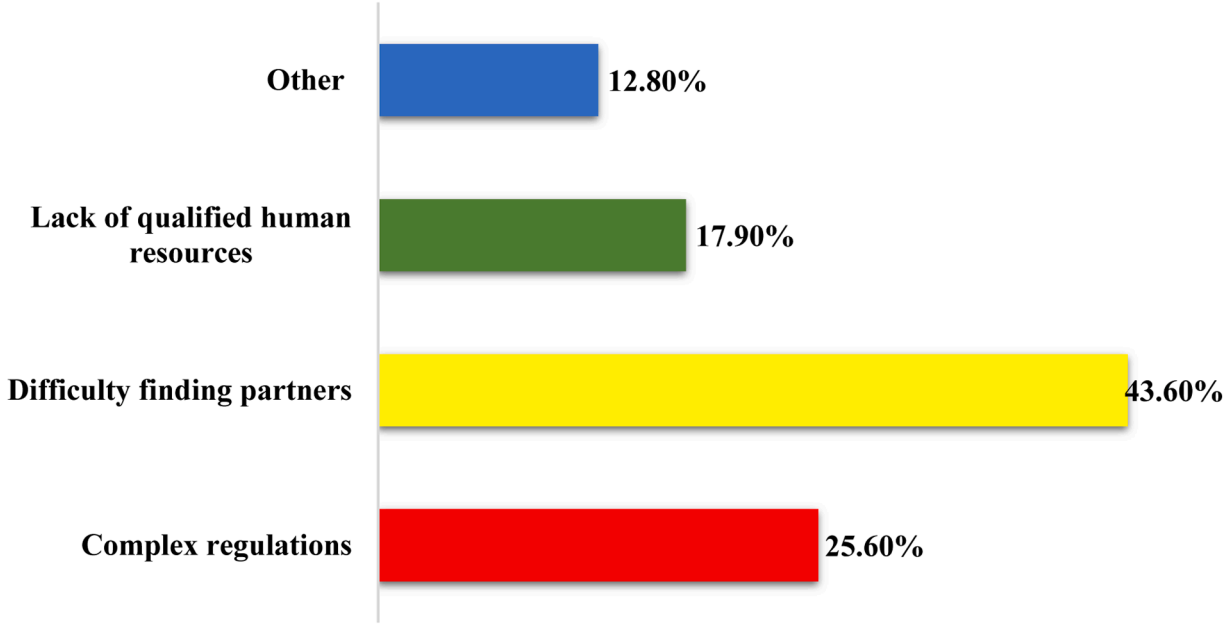


**Fig. 6.** Non-financial constraints faced by green entrepreneurs.
**Source:** Authors, based on field surveys, June 2023

reported by approximately 17.90% of participants, emphasizes the need to invest in human capital to stimulate the development of green businesses. This situation is consistent with the findings of Appiah et al. [12], who emphasize the crucial role of green skills and training for companies wishing to operate sustainably. Developing specialized skills can help overcome this challenge in a transitional environment such as Togo. These findings highlight the importance of partnerships, regulatory navigation, skills building, and addressing the diversity of concerns to foster the development of green entrepreneurship.

### *4.5. State support for green entrepreneurs*

In a context where a diverse range of constraints shape the green entrepreneurial environment, it is imperative to take an in-depth look at the actions undertaken by public authorities to support green entrepreneurs. This analysis will help us to understand how the Togolese government can play a crucial role in the promotion and growth of this emerging sector. Furthermore, collaboration with research institutes is a significant incentive for all types of eco-innovation [67]. Fig. 7 reveals an interesting dichotomy regarding support for green entrepreneurs in Togo. About two-thirds (66%) of green entrepreneurs indicated they had

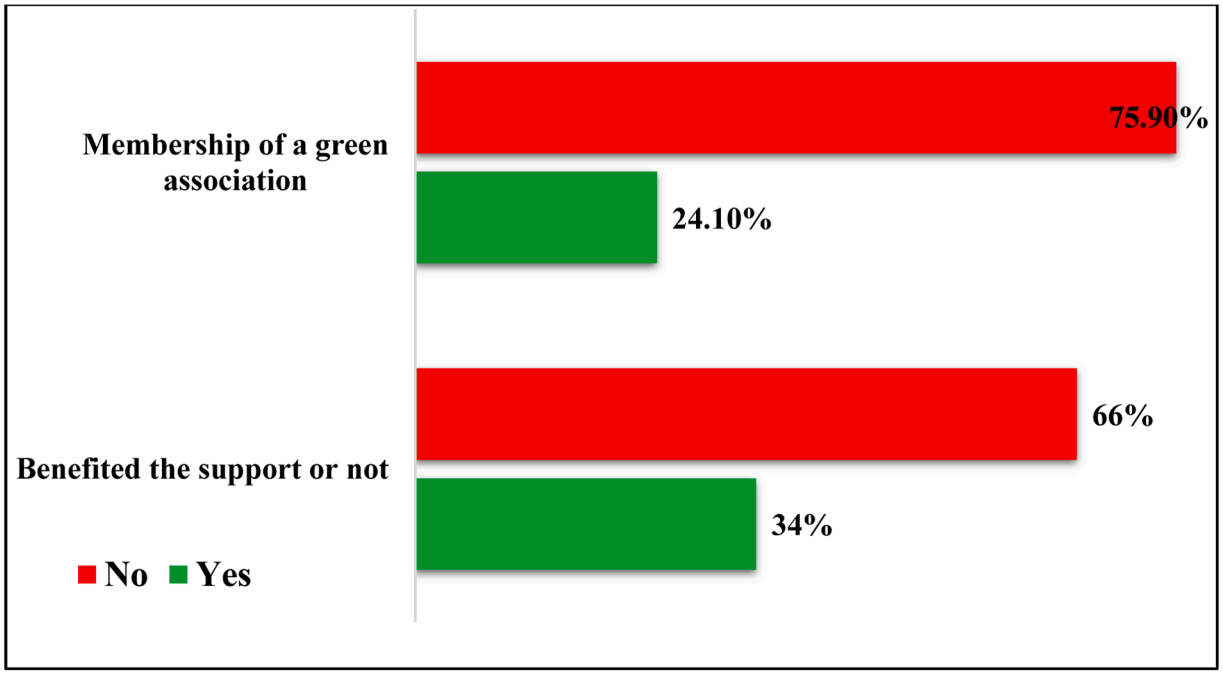


**Fig. 7.** Support and membership of a green entrepreneurs' association.
**Source:** Authors, based on field surveys, June 2023

yet to benefit from support in setting up and developing their businesses. This finding is significant because coaching can provide green entrepreneurs with strategic support, practical advice, and networking opportunities [52]. In addition, more coaching is linked to the need for membership in green associations. The results show that 75.9% of entrepreneurs surveyed do not belong to such an association.

This lack of a professional network can limit opportunities for experience sharing, collaboration, and access to new perspectives. Thus, it confirms the findings of Silajdžić et al. [62], which show that in developing countries, entrepreneurs do not seem willing to assume the risk of investing in businesses focused on sustainable development, while neither the government nor universities seem capable of effectively fulfilling their role in supporting green entrepreneurship.

As a result, green entrepreneurs need to take advantage of the opportunities that networking could offer them. On the other hand, green associations would be ideally placed to play a crucial role in developing sustainable entrepreneurship and, therefore, green growth. Firstly, green associations could facilitate more outstanding networking and experience sharing between entrepreneurs committed to sustainable development, as highlighted by the work of Silajdžić et al. [62] on the importance of professional networks for green entrepreneurs in developing countries. By promoting exchanges of best practices and collaborations, these associations would also provide training and disseminate essential information, further helping to equip green entrepreneurs [53]. Moreover, by organizing themselves within associations, entrepreneurs would be able to make their voices better heard by political decision-makers, making it possible to obtain better support and more appropriate public policies, as Pacheco et al. [52] and Silajdžić et al. [62] point out on the importance of advocacy and representation for green entrepreneurs. Finally, these associations would play an essential role in enhancing the image and visibility of green entrepreneurship through organizing events and targeted communication [26,52].

From the interview results, a support program is not explicitly dedicated to green entrepreneurs within the Youth Economic Initiative Support Funds. However, the structure focuses more on entrepreneurial projects' economic and long-term viability, regardless of whether green. This approach suggests that Youth Economic Initiative Support Funds attach primary importance to the financial feasibility and sustainability of projects undertaken by young entrepreneurs. While the "green" orientation of projects can benefit environmental and social impact, Youth Economic Initiative Support Funds take a more holistic approach, prioritizing economic sustainability as the overriding criterion for financial support and coaching for young entrepreneurs. However, in the absence of specific support for green entrepreneurs, young people with environmental projects can nonetheless benefit from the Youth Economic Initiative Support Funds guidance and support, subject to the economic viability in line with the financial viability criteria established by the structure.

On the other hand, despite the lack of a specific program for green entrepreneurs, some still have grown significantly with the help of the Youth Economic Initiative Support Funds' training courses and funding. Our interview highlighted several salient points, including the difficulties faced by green entrepreneurs supported by the structure. These difficulties are not directly linked to the market itself but rather to the period following the transformation of waste into saleable products. Green entrepreneurs face a crucial challenge regarding payment deadlines, as their customers frequently opt for credit payments. Managing these payment terms is proving complex, leading to contractor cash flow problems and affecting their ability to repay loans.

The findings underscore the critical aspects of supporting green entrepreneurs, particularly the need to reconcile operational challenges with financial considerations. Indeed, one of the significant challenges lies in reconciling the operational and financial considerations facing companies committed to a sustainable approach. As demonstrated by the work of Jiang et al. (2018) and Trabelsi [66] on the circular economy, long-term economic viability is essential to green initiatives' sustainability. These companies must not only meet the technical and organizational challenges of adopting more environmentally friendly practices but also ensure their financial profitability if they are to stand up to the marketplace. This recurring tension between environmental performance and financial profitability is a significant challenge for green entrepreneurs (Qalati et al., 2023). On the one hand, they have to integrate the additional costs of adopting green technologies and greener production processes. On the other hand, they need to ensure that their products and services remain price-competitive with more conventional offerings.

To meet this challenge, it will be essential to establish an ecosystem conducive to green entrepreneurship, combining financial support measures, tax incentives, technical and managerial coaching, as well as the promotion of innovative partnerships (Kyoi and Mori, 2024; Drago & Gatto, 2022; [43]). Only an integrated approach involving all stakeholders (public authorities, investors, research institutions, etc.) will create the conditions for developing viable and sustainable green entrepreneurship in Togo. Indeed, there needs to be a program specifically for green entrepreneurs within the Youth Economic Initiative Support Funds, which raises questions about aligning government policies and priorities regarding sustainable development. However, during the interviews, the idea of supporting green entrepreneurship through economic incentives was discussed, including the proposal for an adapted tax regime for green businesses.

## 5. Conclusion and policy implications

In a world facing growing environmental challenges and increasing pressure on natural resources, the transition to a circular economy is emerging as a crucial alternative. It offers environmental and economic benefits, opening strategic opportunities to reorient business practices towards greater sustainability. In collaboration with Togo's Youth Economic Initiative Support Funds, the study takes stock of green entrepreneurship in Togo by analyzing the data collected from 29 green entrepreneurs in the Greater Lomé region. Green entrepreneurship is a critical element in the transition to a circular economy.

A descriptive analysis reveals that economic motivations, such as job creation and business opportunities, are more critical to green entrepreneurs than environmental motivations. Thus, this is understandable, given the high unemployment rates and socio-economic conditions prevailing in Togo. However, this does not imply that these companies focus solely on economic gains. Nevertheless, it is crucial to provide tailored support for green entrepreneurs, as the Youth Economic Initiative Support Funds of Togo primarily focuses on promoting economic viability in young entrepreneurs. Therefore, public authorities should develop policies and programs to promote green entrepreneurship. Thus, Economic incentives, such as tax breaks, subsidies, and streamlining administrative procedures, can contribute to the growth of sustainable businesses. In addition, raising consumer awareness and promoting responsible purchasing policies in the public sector can stimulate demand for green products and services. This study provides insights into the potential for green entrepreneurship development in Togo. As the country moves towards a circular economy, it is crucial to identify opportunities for sustainable growth and innovation while continuously reflecting on how to provide tailored support for green businesses. It would be pertinent to conduct a study to examine the attitudes and drivers of consumption of products and services from green companies.

While this study aimed to produce reliable results, it's important to acknowledge some limitations. First, although the sample size collected was substantial, an increase in the latter could strengthen the robustness of the results. Carrying out the cross-sectional study by including a larger number of countries will help us better understand the diversity of opportunities and constraints linked to the circular economy on an international scale. An exhaustive analysis of the demand for products from the circular economy will thoroughly enhance the understanding

of consumer preferences and allow for a reorientation of the market. Despite these few limitations, the conclusions of this study constitute a solid basis for better understanding the transition to the circular economy through green entrepreneurship. Additional research on these aspects would enable us to deepen and consolidate these results.

## CRediT authorship contribution statement

**Baladjida Parfait Badjeena:** Writing – review & editing, Writing – original draft, Visualization, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Essossinam Ali:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Kwami Ossadzifo Wonyra:** Supervision. **Katou Tamou:** Writing – review & editing, Visualization.

## Declaration of competing interest

The corresponding on the behalf of other authors of this paper do not have any competing interest to declare.

## References


[1] A. Abuzeinab, M. Arif, Stakeholder engagement: a green business model indicator, Procedia Econ. Finance 18 (2014) 505–512, https://doi.org/10.1016/S2212-5671(14)00969-1.

[2] AfDB. (2024a). Africa Circular Economy Facility (ACEF). https://www.afdb.org/en/topics-and-sectors/topics/circular-economy/africa-circular-economy-facility-acef.

[3] AfDB. (2024b). Le Bénin lance son Plan d'action pour l'économie circulaire, avec le soutien de la Banque africaine de développement. https://www.afdb.org/fr/news-and-events/press-releases/le-benin-lance-son-plan-daction-pour-leconomie-circulaire-avec-le-soutien-de-la-banque-africaine-de-developpement-70928.

[4] AfDB. (2024c). Nigeria Circular Economy Working Group (NCEWG). https://www.afdb.org/en/topics-and-sectors/topics/circular-economy/africa-circular-economy-facility-acef.

[5] AfDB. (2024d). The African Circular Economy Alliance (ACEA). Https://Www.Afdb.Org/En/Topics-and-Sectors/Topics/Circular-Economy/African-Circular-Economy-Alliance-Acea.

[6] E. Ali, Climate change and agricultural development in West Africa: role of renewable energy and trade openness, Environ. Econ. 12 (1) (2021) 14–31, https://doi.org/10.21511/ee.12(1).2021.02.

[7] E. Ali, Farm households' adoption of climate-smart practices in subsistence agriculture: evidence from Northern Togo, Environ. Manage 67 (5) (2021) 949–962, https://doi.org/10.1007/s00267-021-01436-3.

[8] E. Ali, K.M. Adji, Is the Russian invasion of Ukraine a constraint or opportunity for food and energy security in Africa, Int. J. Glob. Environ. Issues 22 (4) (2023) 418–426, https://doi.org/10.1504/IJGENVI.2023.136291.

[9] E. Ali, A.Y.G. Egbendewe, T. Abdoulaye, D.B. Sarpong, Willingness to pay for weather index-based insurance in semi-subsistence agriculture: Evidence from northern Togo, Clim. Policy. 20 (5) (2020) 534–547, https://doi.org/10.1080/14693062.2020.1745742.

[10] J.W. Alstete, On becoming an entrepreneur: an evolving typology, Int. J. Entrep. Behav. Res. 8 (4) (2002) 222–234, https://doi.org/10.1108/13552550210436521.

[11] M.M. Andersen, E. Ogallo, L.G. Diniz Faria, Green economic change in Africa – green and circular innovation trends, conditions and dynamics in Kenyan companies, Innov. Dev. 12 (2) (2022) 231–257, https://doi.org/10.1080/2157930X.2021.1876586.

[12] M.K. Appiah, A. Sam, E. Twum, E. Godslove, Modelling the influencing of green entrepreneurship orientation on sustainable firm performance: A moderated mediation model, Econ. Res.-Ekon. Istraživanja 36 (2) (2023) 2179094, https://doi.org/10.1080/1331677X.2023.2179094.

[13] V.F. Arijeniwa, A.A. Akinsemolu, D.C. Chukwugozie, U.G. Onawo, C.E. Ochulor, U. M. Nwauzoma, D.A. Kawino, H. Onyeaka, Closing the loop: A framework for tackling single-use plastic waste in the food and beverage industry through circular economy- a review, J. Environ. Manage 359 (2024) 120816, https://doi.org/10.1016/j.jenvman.2024.120816.

[14] F. Baarsch, J.R. Granadillos, W. Hare, M. Knaus, M. Krapp, M. Schaeffer, H. Lotze-Campen, The impact of climate change on incomes and convergence in Africa, World Dev. 126 (2020) 104699, https://doi.org/10.1016/j.worlddev.2019.104699.

[15] N. Bayale, E. Ali, A.-F. Tchagnao, A. Nakumuryango, Determinants of renewable energy production in WAEMU countries: New empirical insights and policy implications, Int. J. Green. Energy 18 (6) (2021) 602–614, https://doi.org/10.1080/15435075.2021.1875467.

[16] P. Behuria, Ban the (plastic) bag? Explaining variation in the implementation of plastic bag bans in Rwanda, Kenya and Uganda, Environ. Plan. C: Polit. Space 39 (8) (2021) 1791–1808, https://doi.org/10.1177/2399654421994836.

[17] B. Berry, J. Haverkamp, C. Isenhour, M.M. Bilec, S.S. Lowden, Is convergence around the circular economy necessary? Exploring the productivity of divergence in US circular economy discourse and practice, Circ. Econ. Sustain. (2022), https://doi.org/10.1007/s43615-022-00199-1.

[18] P. Biernacki, D. Waldorf, Snowball sampling: problems and techniques of chain referral sampling, Sociol. Methods Res. 10 (2) (1981) 141–163, https://doi.org/10.1177/004912418101000205.

[19] N.M.P. Bocken, Sustainable venture capital – catalyst for sustainable start-up success? J. Clean. Prod. 108 (2015) 647–658, https://doi.org/10.1016/j.jclepro.2015.05.079.

[20] N.M.P. Bocken, I. de Pauw, C. Bakker, B. van der Grinten, Product design and business model strategies for a circular economy, J. Ind. Prod. Eng. 33 (5) (2016) 308–320, https://doi.org/10.1080/21681015.2016.1172124.

[21] C. Brush, L.F. Edelman, T. Manolova, F. Welter, A gendered look at entrepreneurship ecosystems, Small Bus. Econ. 53 (2) (2019) 393–408, https://doi.org/10.1007/s11187-018-9992-9.

[22] P. Centobelli, R. Cerchione, E. Esposito, R. Passaro, Shashi, Determinants of the transition towards circular economy in SMEs: A sustainable supply chain management perspective, Int. J. Prod. Econ. 242 (2021) 108297, https://doi.org/10.1016/j.ijpe.2021.108297.

[23] P. Chen, A.A. Dagestani, What lies about circular economy practices and performance? Fresh insights from China, J. Clean. Prod. (2023) 137893, https://doi.org/10.1016/j.jclepro.2023.137893.

[24] I. Confente, D. Scarpi, I. Russo, Marketing a new generation of bio-plastics products for a circular economy: The role of green self-identity, self-congruity, and perceived value, J. Bus. Res. 112 (2020) 431–439, https://doi.org/10.1016/j.jbusres.2019.10.030.

[25] J.W. Creswell, Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 4, SAGE, 2014.

[26] A. Davari, D. Strutton, Marketing mix strategies for closing the gap between green consumers' pro-environmental beliefs and behaviors, J. Strat. Market. 22 (7) (2014) 563–586, https://doi.org/10.1080/0965254X.2014.914059.

[27] A. De Jesus, S. Mendonça, Lost in transition? Drivers and barriers in the eco-innovation road to the circular economy, Ecol. Econ. 145 (2018) 75–89, https://doi.org/10.1016/j.ecolecon.2017.08.001.

[28] K.P. Ernst, R. Pagot, J.R. Prá, Sustainable development goal 5: Women's political participation in South America, World Dev. Sustain. 4 (2024) 100138, https://doi.org/10.1016/j.wds.2024.100138.

[29] N. Ferronato, E.C. Rada, M.A. Gorritty Portillo, L.I. Cioca, M. Ragazzi, V Torretta, Introduction of the circular economy within developing regions: A comparative analysis of advantages and opportunities for waste valorization, J. Environ. Manage 230 (2019) 366–378, https://doi.org/10.1016/j.jenvman.2018.09.095.

[30] B. Fuller, Y. Liu, S. Bajaba, L.E. Marler, J. Pratt, Examining how the personality, self-efficacy, and anticipatory cognitions of potential entrepreneurs shape their entrepreneurial intentions, Pers. Individ. Dif. 125 (2018) 120–125, https://doi.org/10.1016/j.paid.2018.01.005.

[31] S. Geisendorf, F. Pietrulla, The circular economy and circular economic concepts—a literature analysis and redefinition, Thunderbird Int. Bus. Rev. 60 (5) (2018) 771–782, https://doi.org/10.1002/tie.21924.

[32] Á. González-Moreno, Á. Triguero, C. Díaz-García, F.J. Sáez-Martínez, Circular economy and entrepreneurship in Europe: an analysis of the impact of cultural factors, regulatory framework and rate of entrepreneurship, Environ. Technol. Innov. 35 (2024) 103656, https://doi.org/10.1016/j.eti.2024.103656.

[33] M. Greenstone, B.K. Jack, Envirodevonomics: A research agenda for an emerging field, J. Econ. Lit. 53 (1) (2015) 5–42, https://doi.org/10.1257/jel.53.1.5.

[34] S. Haldar, Towards a conceptual understanding of sustainability-driven entrepreneurship, Corp. Soc. Responsib. Environ. Manage 26 (6) (2019) 1157–1170, https://doi.org/10.1002/csr.1763.

[35] G. Heinemann, Innovating in the off-grid sector: Sustainable supply chains and business models for solar home system provision in Bangladesh and Kenya, Energy Res. Soc. Sci. 94 (2022) 102853, https://doi.org/10.1016/j.erss.2022.102853.

[36] M. Henrysson, C. Nuur, The Role of Institutions in Creating Circular Economy Pathways for Regional Development, J. Environ. Dev. 30 (2) (2021) 149–171, https://doi.org/10.1177/1070496521991876.

[37] J. Hörisch, J. Kollat, S.A. Brieger, What influences environmental entrepreneurship? A multilevel analysis of the determinants of entrepreneurs' environmental orientation, Small Bus. Econ. 48 (1) (2017) 47–69, https://doi.org/10.1007/s11187-016-9765-2.

[38] R. Hou, S. Li, H. Chen, G. Ren, W. Gao, L. Liu, Coupling mechanism and development prospect of innovative ecosystem of clean energy in smart agriculture based on blockchain, J. Clean. Prod. 319 (2021) 128466, https://doi.org/10.1016/j.jclepro.2021.128466.

[39] A. Laguía, J.A. Moriano, M.J. Gorgievski, A psychosocial study of self-perceived creativity and entrepreneurial intentions in a sample of university students, Think. Skills. Creat. 31 (2019) 44–57, https://doi.org/10.1016/j.tsc.2018.11.004.

[40] A. Lampert, Over-exploitation of natural resources is followed by inevitable declines in economic growth and discount rate, Nat. Commun. 10 (1) (2019) 1419, https://doi.org/10.1038/s41467-019-09246-2.

[41] Z. Malcolm, B. Macaulay, M. Todd, Towards a circular economy and just transition to net-zero in rural Scotland: Resident perspectives on policy and practice, J. Rural. Stud. 108 (2024) 103300, https://doi.org/10.1016/j.jrurstud.2024.103300.

[42] E. Mamba, Natural resource rents, manufacturing trade, and manufacturing growth: Evidence from linear and nonlinear regressions for ECOWAS countries, Comp. Econ. Stud. (2024), https://doi.org/10.1057/s41294-024-00234-0.

[43] S. Mondal, S. Singh, H. Gupta, Green entrepreneurship and digitalization enabling the circular economy through sustainable waste management—An exploratory

study of emerging economy, J. Clean. Prod. 422 (2023) 138433, https://doi.org/10.1016/j.jclepro.2023.138433.
[44] I.S. Mouleye, A. Diaw, Y. Hamadou Daouda, Effets du changement climatique sur la pauvreté et les inégalités en Afrique subsaharienne, Rev. d'écon. Du Dév. 27 (3) (2020) 5–32, https://doi.org/10.3917/edd.333.0005.
[45] T.C. Muzamwese, M.A. Heldeweg, L. Franco-Garcia, Financing and business models for scaling up sustainable business networks—building a circular economy, Circ. Econ. Sustain. (2024), https://doi.org/10.1007/s43615-024-00348-8.
[46] M. Neuner, G. Raab, L.A. Reisch, Compulsive buying in maturing consumer societies: an empirical re-inquiry, J. Econ. Psychol. 26 (4) (2005) 509–522, https://doi.org/10.1016/j.joep.2004.08.002.
[47] X. Ni, Z. Wang, A. Akbar, S. Ali, Natural resources volatility, renewable energy, R&D resources and environment: Evidence from selected developed countries, Resour. Policy. 77 (2022) 102655, https://doi.org/10.1016/j.resourpol.2022.102655.
[48] W. Nordhaus, Climate change: the ultimate challenge for economics, Am. Econ. Rev. 109 (6) (2019) 1991–2014, https://doi.org/10.1257/aer.109.6.1991.
[49] I.A. Ochieng, H.C. Thornton, R.A. Owusu, Internationalisation patterns of African sharing economy companies: the role of gateway markets, J. Bus. Res. 170 (2024) 114297, https://doi.org/10.1016/j.jbusres.2023.114297.
[50] B.J. Orser, A.L. Riding, K. Manley, Women entrepreneurs and financial capital, Entrep. Theory Pract. 30 (5) (2006) 643–665, https://doi.org/10.1111/j.1540-6520.2006.00140.x.
[51] O. Ouro-Salim, P. Guarnieri, A.D. Fanho, Unlocking value: circular economy in ngos' food waste reduction efforts in Brazil and Togo, Discov. Environ. 2 (1) (2024) 46, https://doi.org/10.1007/s44274-024-00042-4.
[52] D.F. Pacheco, T.J. Dean, D.S. Payne, Escaping the green prison: Entrepreneurship and the creation of opportunities for sustainable development, J. Bus. Ventur. 25 (5) (2010) 464–480, https://doi.org/10.1016/j.jbusvent.2009.07.006.
[53] E. Petridou, M. Mintrom, A research agenda for the study of policy entrepreneurs, Policy Stud. J. 49 (4) (2021) 943–967, https://doi.org/10.1111/psj.12405.
[54] M.E. Porter, C.V.D. Linde, Toward a new conception of the environment-competitiveness relationship, J. Econ. Perspect. 9 (4) (1995) 97–118, https://doi.org/10.1257/jep.9.4.97.
[55] J. Randjelovic, A.R. O'Rourke, R.J. Orsato, The emergence ofgreen venture capital, Bus. Strategy. Environ. 12 (4) (2003) 240–253, https://doi.org/10.1002/bse.361.
[56] R. Rasiah, F. Kari, Y. Sadoi, N. Mintz-Habib, Climate change and sustainable development issues: Arguments and policy initiatives, J. Asia Pac. Econ. 23 (2) (2018) 187–194, https://doi.org/10.1080/13547860.2018.1442140.
[57] E. Sánchez-García, J. Martínez-Falcó, B. Marco-Lajara, E. Manresa-Marhuenda, Revolutionizing the circular economy through new technologies: A new era of sustainable progress, Environ. Technol. Innov. 33 (2024) 103509, https://doi.org/10.1016/j.eti.2023.103509.
[58] R. Sarvari, Y. Jabarzadeh, A. Karami, M. Jabarnejad, An interpretive structural modeling—analytic network process approach for analysing green entrepreneurship barriers, Int. Entrep. Manag. J. (2023), https://doi.org/10.1007/s11365-023-00881-2.
[59] S. Schaltegger, M. Wagner, Sustainable entrepreneurship and sustainability innovation: categories and interactions, Bus. Strategy. Environ. 20 (4) (2011) 222–237, https://doi.org/10.1002/bse.682.
[60] D.A. Shepherd, H. Patzelt, The new field of sustainable entrepreneurship: studying entrepreneurial action linking "what is to be sustained" with "what is to be developed.", Entrep. Theory Pract. 35 (1) (2011) 137–163, https://doi.org/10.1111/j.1540-6520.2010.00426.x.
[61] A. Sher, S. Mazhar, F. Zulfiqar, D. Wang, X. Li, Green entrepreneurial farming: a dream or reality? J. Clean. Prod. 220 (2019) 1131–1142, https://doi.org/10.1016/j.jclepro.2019.02.198.
[62] I. Silajdžić, S.M. Kurtagić, B. Vučijak, Green entrepreneurship in transition economies: a case study of Bosnia and Herzegovina, J. Clean. Prod. 88 (2015) 376–384, https://doi.org/10.1016/j.jclepro.2014.07.004.
[63] W. Stubbs, C. Cocklin, Conceptualizing a "sustainability business model.", Organ. Environ. 21 (2) (2008) 103–127, https://doi.org/10.1177/1086026608318042.
[64] D. Tavani, Wage bargaining and induced technical change in a linear economy: model and application to the US (1963–2003), Struct. Chang. Econ. Dyn. 23 (2) (2012) 117–126, https://doi.org/10.1016/j.strueco.2011.11.001.
[65] C. Theodoraki, L.-P. Dana, A. Caputo, Building sustainable entrepreneurial ecosystems: a holistic approach, J. Bus. Res. 140 (2022) 346–360, https://doi.org/10.1016/j.jbusres.2021.11.005.
[66] E. Trabelsi, Transition to sustainable environment and economic growth in Tunisia: an ARDL approach, World Dev. Sustain. (2024) 100165, https://doi.org/10.1016/j.wds.2024.100165.
[67] A. Triguero, L. Moreno-Mondéjar, M.A. Davia, Drivers of different types of eco-innovation in European SMEs, Ecol. Econ. 92 (2013) 25–33, https://doi.org/10.1016/j.ecolecon.2013.04.009.
[68] M.D. Vasilescu, G.C. Dimian, G.I. Gradinaru, Green entrepreneurship in challenging times: a quantitative approach for European countries, Econ. Res.-Ekon. Istraživanja 36 (1) (2023) 1828–1847, https://doi.org/10.1080/1331677X.2022.2093767.
[69] V. Veleva, G. Bodkin, Corporate-entrepreneur collaborations to advance a circular economy, J. Clean. Prod. 188 (2018) 20–37, https://doi.org/10.1016/j.jclepro.2018.03.196.
[70] H.K.E. Vervaeke, D.J. Korf, A. Benschop, W Van Den Brink, How to find future ecstasy-users: targeted and snowball sampling in an ethically sensitive context, Addict. Behav. 32 (8) (2007) 1705–1713, https://doi.org/10.1016/j.addbeh.2006.11.008.
[71] A.M. Walker, K. Opferkuch, E. Roos Lindgreen, A. Raggi, A. Simboli, W.J. V. Vermeulen, S. Caeiro, R. Salomone, What is the relation between circular economy and sustainability? Answers from frontrunner companies engaged with circular economy practices, Circ. Econ. Sustain. 2 (2) (2022) 731–758, https://doi.org/10.1007/s43615-021-00064-7.
[72] World Bank. (2020). Dynamiser l ' investissement privé pour plus de croissance et d ' emplois. https://documents1.worldbank.org/curated/en/329991599079506564/pdf/Rapport-sur-la-Situation-Economique-du-Togo-Dynamiser-l-Investissement-Prive-Pour-Plus-de-Croissance-et-d-Emploi.pdf.
[73] V. Yadav, J. Unni, Women entrepreneurship: Research review and future directions, J. Glob. Entrep. Res. 6 (1) (2016) 12, https://doi.org/10.1186/s40497-016-0055-x.
[74] M.Z. Yaqub, R.M.S. Yaqub, S.Y. Khan, M. Murad, How does the government's sustainable consumption policy enkindle sustainable consumption behaviors in the consumer public?. Clean. Responsible Consump., 2024 100196, https://doi.org/10.1016/j.clrc.2024.100196.
[75] J.G. York, S. Venkataraman, The entrepreneur–environment nexus: uncertainty, innovation, and allocation, J. Bus. Ventur. 25 (5) (2010) 449–463, https://doi.org/10.1016/j.jbusvent.2009.07.007.