



Sustainable human capital strategies for nurturing entrepreneurial ecosystems in Nigeria

Akinola, Emmanuel Taiwo¹
 Akintunde-Adeyi, Fumilayo Julianah²
 AKINOLA Enoch Oluwakayode³



(✉ Corresponding Author)

¹Division of Statistics and Records, Adeyemi Federal University of Education, Ondo, Ondo State, Nigeria.

¹Email: marshallakinola@gmail.com

²Bowen University, Iwo, Osun State, Nigeria.

²Email: julianah.akintunde-adeyi@bowen.edu.ng

³Department of Fine and Applied Arts, Adeyemi Federal University of Education, Ondo, Ondo State, Nigeria.

³Email: akinolaenochk@gmail.com

Abstract

This study investigates the role of sustainable human capital strategies in nurturing entrepreneurial ecosystems, with a focus on companies in Southwest, Nigeria. Drawing on the Resource-Based View (RBV) and Dynamic Capabilities Theory, the research highlights how human capital, as a strategic resource, drives competitive advantage and innovation. Employing a mixed-methods approach, the study combines quantitative surveys and qualitative interviews to provide a comprehensive understanding of workforce development, skill acquisition, and sustainability practices in fostering entrepreneurship. The findings reveal that sustainable human capital strategies such as, continuous learning, inclusive talent pipelines, and green HR practices significantly enhance entrepreneurial performance by improving innovation, operational efficiency, and market adaptability. Challenges such as inadequate funding, regulatory misalignment, and limited access to advanced training programmes were identified, but opportunities exist through leveraging technology, fostering public-private partnerships, and aligning educational curricula with industry needs. Data from 300 respondents across various sectors in Southwest, Nigeria, including HR managers, entrepreneurs, and policymakers, was analyzed using regression and thematic analysis. The results underscore the importance of strategic investments in workforce training and sustainability to build resilient entrepreneurial ecosystems. Recommendations include adopting green HR practices, developing collaborative frameworks between the public and private sectors, and integrating sustainability into policy and educational systems. This study contributes to literature by providing empirical insights and actionable strategies for aligning human capital development with sustainable entrepreneurial growth, offering valuable implications for emerging economies globally.

Keywords: Entrepreneurial ecosystems, Green HR practices, Public-private partnerships, Sustainable human capital strategies, Workforce development.

Citation | Taiwo, A. E., Julianah, A.-A. F., & Oluwakayode, A. E. (2026). Sustainable human capital strategies for nurturing entrepreneurial ecosystems in Nigeria. *Economy*, 13(1), 24–32. 10.20448/economy.v13i1.8280

History:

Received: 22 December 2025

Revised: 3 February 2026

Accepted: 12 February 2026

Published: 6 March 2026

Licensed: This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/)

Publisher: Asian Online Journal Publishing Group

Funding: The study did not receive any funding.

Institutional Review Board Statement: This study was approved by the Institutional Review Board of Adeyemi Federal University of Education, Ondo, Nigeria under IRB Protocol Number: IRB/AFUED/2026/002. Informed verbal consent was obtained from all participants, and all data were anonymized to protect participant confidentiality.

Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Competing Interests: The authors declare that they have no competing interests.

Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

Contents

1. Introduction	25
2. Literature Review	26
3. Empirical Review	27
4. Theoretical Review.....	28
5. Methodology	29
6. Discussion of Findings.....	30
7. Conclusion	31
References.....	32

Contribution of this paper to the literature

This study is original in its integrated examination of sustainable human capital strategies within entrepreneurial ecosystems in Southwest Nigeria, combining RBV, Dynamic Capabilities, SET, and Green HRM theories using mixed methods, while providing firm-level empirical evidence and context-specific policy insights rarely explored in prior Nigerian studies.

1. Introduction

Entrepreneurial ecosystems are dynamic networks of interdependent actors and institutions, including entrepreneurs, policymakers, financial institutions, and educational systems that collectively foster innovation and economic development. These ecosystems thrive on the availability and quality of human capital, which serves as the bedrock for entrepreneurial ventures. Human capital refers to the knowledge, skills, and abilities that individuals bring to the entrepreneurial process, and it plays a crucial role in enabling innovation, improving productivity, and enhancing competitiveness (Becker, 2020).

The concept of entrepreneurial ecosystems has gained prominence as a critical framework for understanding how regional and global economies adapt to changing demands. According to Isenberg (2011), entrepreneurial ecosystems are interdependent systems where diverse stakeholders converge to support entrepreneurial activity. This makes human capital the central driver of ecosystem vibrancy, with innovation and creativity emerging as key outputs (Lee & Park, 2023). However, in the absence of sustainable practices, the long-term viability of these ecosystems can be compromised, particularly in regions grappling with socio-economic constraints.

Sustainability in human capital strategies has become an imperative in recent years, as organizations and ecosystems face mounting pressures to align economic growth with environmental and societal goals. Sustainable human capital strategies prioritize practices that go beyond traditional workforce development to include equitable opportunities, green HRM, and inclusive talent management (Jackson & Seo, 2022). For example, Zhang and Li (2022) highlight how digital literacy programmes and lifelong learning initiatives significantly enhance entrepreneurial ecosystems' resilience and adaptability. Such initiatives not only ensure a steady supply of skilled labor but also encourage environmentally responsible and socially inclusive entrepreneurship.

Emerging economies, such as those in Sub-Saharan Africa, present unique opportunities and challenges for the integration of sustainable human capital strategies. These economies often exhibit high levels of entrepreneurial activity driven by necessity rather than opportunity. While this fosters innovation, the lack of access to capital, training, and policy support often impedes sustainable growth (Afolabi, Ibidapo, & Adegbe, 2021). As a result, fostering entrepreneurial ecosystems in these regions requires a multi-stakeholder approach that emphasizes collaboration between government, academia, and private enterprises. Furthermore, Kumar and Rajan (2021) argue that public-private partnerships can be instrumental in addressing resource constraints and driving large-scale change.

Given the above dynamics, this study explores how sustainable human capital strategies can be leveraged to build resilient entrepreneurial ecosystems. By examining global best practices and contextual challenges, the research aims to provide actionable insights for policymakers, educators, and industry leaders seeking to promote sustainable entrepreneurship. This approach underscores the importance of aligning human capital development with broader environmental and social sustainability goals, ensuring a robust foundation for long-term economic resilience and growth.

1.1. Research Objectives

The broad objective of the study is to investigate the influence of sustainable human capital strategies on the development and resilience of entrepreneurial ecosystems, particularly in emerging economies with the following specific objectives.

- i. To assess how sustainable human capital strategies enhance innovation and resilience within entrepreneurial ecosystems.
- ii. To identify effective human capital policies and practices that support sustainable entrepreneurship.
- iii. To analyze the challenges associated with implementing sustainable human capital strategies in resource-constrained environments.
- iv. To evaluate the opportunities for fostering sustainable entrepreneurship through multistakeholder collaboration.
- v. To propose actionable recommendations for aligning sustainable human capital development with entrepreneurial ecosystem growth.

1.2. Research Questions

- i. How do sustainable human capital strategies enhance innovation and resilience within entrepreneurial ecosystems?
- ii. What are the most effective human capital policies and practices for supporting sustainable entrepreneurship?
- iii. What challenges hinder the implementation of sustainable human capital strategies in resource-constrained environments?
- iv. What opportunities exist for fostering sustainable entrepreneurship through multistakeholder collaboration?
- v. What actionable recommendations can align sustainable human capital development with entrepreneurial ecosystem growth?

1.3. Research Hypotheses

H01: Sustainable human capital strategies significantly enhance innovation and resilience within entrepreneurial ecosystems.

H02: Effective human capital policies and practices positively influence sustainable entrepreneurship.

H03: Resource constraints present significant challenges to the implementation of sustainable human capital strategies in emerging economies.

H04: Multi-stakeholder collaboration plays a critical role in fostering sustainable entrepreneurial ecosystems.

H05: Aligning sustainable human capital development with entrepreneurial ecosystem goals leads to improved ecosystem growth and sustainability.

1.4. Operational Definition of Terms

Sustainable Human Capital Strategies: Strategic approaches to workforce development and management that prioritize the alignment of human resource practices with long-term economic, environmental, and societal goals. Examples include green HRM practices, equitable training programmes and inclusive recruitment policies.

Entrepreneurial Ecosystems: Interdependent networks comprising entrepreneurs, support organizations, financial institutions, policymakers, and educational entities that collectively foster innovation, business creation, and economic growth.

Sustainable Entrepreneurship: Business ventures and practices that integrate profitability with social and environmental responsibility, contributing to sustainable development goals while ensuring economic viability.

Green HR Practices: Environmentally conscious human resource policies designed to minimize an organization's ecological footprint, such as paperless operations, energy-efficient work environments, and sustainable employee engagement practices.

Stakeholder Collaboration: Cooperative efforts between different entities, including government agencies, private sectors, non-governmental organizations, and educational institutions, aimed at fostering entrepreneurship and sustainability within ecosystems.

Resource-Constrained Environments: Settings characterized by limited access to financial, educational, and infrastructural resources, often found in emerging economies, which challenge traditional models of business and workforce development.

Inclusive Talent Pipelines: Systems and processes designed to ensure equitable access to career opportunities, skills development, and workforce participation for diverse demographic groups, including marginalized communities.

Resilience: The ability of entrepreneurial ecosystems to adapt, recover, and thrive amid challenges such as economic downturns, technological disruptions, or resource scarcity.

2. Literature Review

2.1. Human Capital

Human capital is a critical driver of entrepreneurial success, influencing business survival, growth, and innovation (Becker, 2020). It encompasses a broad range of competencies (experience, creativity, leadership, adaptability) and is an active component driving strategy and decision making. Strategic human capital use is vital for operational efficiency, market differentiation, and sustainable development (Becker, 2020; Grant, 1991).

The Resource-Based View (RBV) suggests that human capital, when strategically managed, is a unique, valuable, and non-substitutable resource, creating a sustained competitive advantage (Barney, 1991). Entrepreneurs leveraging this resource effectively differentiate their businesses through specialized knowledge and leadership (Becker, 2020; Grant, 1991).

In today's dynamic environment, human capital requires continuous development. Competencies like creativity, leadership, and adaptability are crucial for responding to market shifts and technological advancements (Becker, 2020; Zollo & Winter, 2002). These competencies involve both individual skills and a culture of learning and knowledge sharing.

Strategic human capital use involves more than recruitment; it requires systematic development (training, mentoring, continuous learning) to build a capable workforce (Becker, 2020; Grant, 1991). This includes leadership development, cross-training, and knowledge sharing to ensure employees are skilled and can apply their knowledge strategically.

Furthermore, strategic human capital use is linked to market differentiation and sustainable development. Leveraging workforce knowledge and creativity allows businesses to offer unique products and experiences (Becker, 2020; Porter, 1985). Aligning human capital with strategic goals enables firms to anticipate and shape market demands (Becker, 2020; Zollo & Winter, 2002).

Sustainable development is driven by strategic human capital use. Integrating sustainability into human capital strategy (e.g., green HRM, inclusive training) attracts talent, enhances engagement, and fosters innovation (Jackson & Seo, 2022). Aligning workforce goals with sustainability is crucial for long-term success (Afolabi et al., 2021; Jackson & Seo, 2022).

2.2. Human Capital in Entrepreneurial Ecosystems

Human capital is recognized as a pivotal driver of entrepreneurial success, influencing not only survival but also growth and the innovative potential of businesses across different contexts. Skilled individuals bring more than technical expertise to entrepreneurial ventures; they also contribute leadership, creativity, and the ability to adapt to new challenges (Becker, 2020). In emerging economies, where structural deficiencies in education and skill development are prevalent, human capital deficits can significantly impede entrepreneurial growth and hinder the capacity of businesses to scale (Afolabi et al., 2021; Akinola, Joda, Aderemi-Williams, & Amira, 2023). These regions often face challenges such as limited access to quality education and vocational training, which restrict the pool of skilled labor available to entrepreneurs. Moreover, entrepreneurs in these contexts must navigate a complex landscape of informal institutions, weak governance structures, and a lack of access to financial resources, which can further exacerbate human capital shortages (McGrath, 2010). Thus, the effective development of human capital becomes not just a challenge but a critical strategic imperative for entrepreneurs aiming to build sustainable businesses in these environments.

2.3. Sustainable Practices in Human Capital Development

Sustainable human capital practices are increasingly recognized as essential for fostering long term business success in today's competitive and dynamic markets. Practices such as green Human Resource Management (HRM) and inclusive training programmes are gaining traction as businesses seek to align human capital strategies with broader sustainability goals. Green HRM refers to integrating environmental sustainability principles into HR practices, focusing on reducing the ecological footprint of the workforce and promoting sustainable behavior among employees (Jackson & Seo, 2022). Organizations adopting green HRM practices often report higher levels of employee engagement, increased innovation, and better adaptation to environmental changes (Jackson & Seo, 2022). This is largely because sustainable practices foster a sense of responsibility among employees, aligning their personal values with organizational objectives. Inclusive training programmes also play a crucial role in enhancing human capital development by providing employees with the necessary skills to adapt to new technologies and methodologies. Research shows that businesses that invest in inclusive training programmes not only improve their workforce's capabilities but also drive employee innovation and organizational agility (Chowdhury, Hoque, & Mia, 2022).

2.4. Challenges and Opportunities

Implementing sustainable human capital strategies presents both challenges and opportunities. Key challenges include inadequate funding for training, policy misalignment hindering sustainable HRM (Chowdhury et al., 2022), and resistance to change. Opportunities lie in leveraging technology for remote learning and digital skills development, utilizing public-private partnerships for resource pooling (Chowdhury et al., 2022) and integrating sustainability into educational curricula (Jackson & Seo, 2022). Strategic human capital management is essential for entrepreneurial success. Integrating the Resource-Based View and Dynamic Capabilities Theory highlights human capital's role in competitive advantage. Sustainable HRM practices (e.g., green

HRM, inclusive training) enhance engagement and innovation. While challenges persist, opportunities in technology, PPPs, and education can drive positive changes and support sustainable development. Investing in human capital is not just a competitive advantage, but a necessity for long-term success in the face of evolving pressures.

3. Empirical Review

This empirical review synthesizes research on the interplay between human capital development, sustainability, and entrepreneurial growth, focusing on emerging economies.

3.1. Building Inclusive Talent Pipelines through Sustainable Human Capital Strategies

Research indicates that effective human capital strategies can significantly enhance entrepreneurial ecosystems by fostering inclusive talent pipelines. A study by Afolabi et al. (2021) on emerging economies highlights those deficiencies in human capital, particularly skills shortages often hinder the growth of small and medium-sized enterprises (SMEs). The authors argue that sustainable human capital development, which includes comprehensive training programmes and access to skill development opportunities, is crucial for mitigating these deficits and driving entrepreneurial success. This is consistent with the findings of Becker (2020), who emphasizes that skilled individuals are vital for enhancing competitiveness and innovation within businesses.

Considering the empirical evidence from Afolabi et al. (2021) which found that SMEs with access to inclusive training programmes and vocational education had a higher rate of innovation and growth compared to those without such opportunities. This study suggests that integrating lifelong learning programmes can help bridge the skills gap, allowing entrepreneurs to adopt new technologies and market trends more effectively. The research also highlights the importance of partnerships between government, private sector, and educational institutions to create a supportive environment for skill development. This is particularly relevant for emerging economies where traditional education systems may not be able to keep pace with the rapidly changing demands of the market (Chowdhury et al., 2022).

This empirical review underscores the need for sustainable human capital strategies to go beyond traditional training methods and include policies that promote continuous learning and skill development. These strategies not only address skill shortages but also prepare the workforce for future challenges, such as digital transformation and environmental sustainability (Jackson & Seo, 2022). The findings justify the integration of green HRM practices into human capital development efforts, as these practices not only enhance employee engagement but also drive sustainable innovation (Paillé & Mejía-Morelos, 2020).

3.2. Investing in Lifelong Learning Programmes for Entrepreneurial Resilience

Lifelong learning builds entrepreneurial resilience. Jackson and Seo (2022) found businesses investing in employee development (technical skills, leadership) experienced higher innovation and adaptability. Their research showed these businesses improved operational efficiency and fostered innovation and sustainability, developing skills in green technologies and digital transformation. They also highlight the role of public-private partnerships (Chowdhury et al., 2022). This justifies sustainable human capital strategies tailored to workforce needs, focusing on skills critical for sustainable development (digital literacy, environmental management, ethics), particularly in response to shocks (Paillé & Mejía-Morelos, 2020).

3.3. Fostering Multi-Stakeholder Collaborations to Drive Sustainable Innovation

Multi-stakeholder collaborations leverage sustainable human capital strategies. Chowdhury et al. (2022) found businesses engaging in such collaborations reported higher innovation and market access, adopting sustainable HRM practices (green recruitment, sustainability training). Their research showed SMEs in partnerships accessed resources (grants, training, knowledge sharing), improving environmental footprint and employee morale. This underscores is aligning business strategies with sustainability (Becker, 2020). Chowdhury et al. (2022) provide a case for integrating sustainable human capital strategies through collaborations, arguing they are essential for

developing a skilled workforce for sustainability challenges, and highlighting the role of government support (Teece, 2007).

3.4. Challenges and Opportunities in Sustainable Human Capital Strategies

Sustainable human capital strategies face challenges. Paillé and Mejía-Morelos (2020) identified inadequate funding, policy misalignment, and resistance to change as barriers to green HRM in Latin American SMEs. They noted the cost of sustainable practices but also the benefits (increased engagement, reduced turnover, enhanced innovation) when integrated strategically (Chowdhury et al., 2022). This justifies targeted policy interventions and support, emphasizing the role of education in bridging knowledge gaps (Jackson & Seo, 2022).

4. Theoretical Review

The study was anchored on four theories, which are the Resource-Based View (RBV) Theory, Dynamic Capabilities Theory, Social Exchange Theory and Green HRM Theory. They are considered vital in sustainable human capital strategies for nurturing entrepreneurial ecosystems and will better explain the various components in this work.

4.1. Resource-Based View (RBV)

The Resource-Based View (RBV) explains how human capital acts as a strategic resource in entrepreneurial ecosystems. Firms gain competitive advantage through valuable, rare, inimitable, and non-substitutable resources (Barney, 1991). Human capital (Skills, knowledge, expertise) drives innovation and performance (Becker, 2020; Wernerfelt, 1984). This study explores how sustainable human capital strategies (Continuous learning, vocational training, knowledge sharing) enhance these competencies.

Unique skills and capabilities create competitive advantage under RBV. Sustainable human capital strategies (Green HRM, inclusive training) are rare in emerging economies, offering differentiation opportunities (Teece, 2007). This paper examines how these strategies enhance engagement and drive innovation (digital transformation, sustainability, entrepreneurship) (Chowdhury et al., 2022).

Human capital sustainability and resilience are crucial for long-term success. Sustainable HRM practices (work-life balance, flexible work, green initiatives) create a non-substitutable resource by fostering loyalty and reducing turnover (Paillé & Mejía-Morelos, 2020). This study discusses how these practices can be integrated into organizational culture to sustain competitive advantage.

4.2. Dynamic Capabilities Theory

Dynamic Capabilities Theory complements RBV by focusing on a firm's ability to adapt and reconfigure resources in response to changing market conditions and technological advancements (Teece, Pisano, & Shuen, 1997). This is crucial in entrepreneurial ecosystems facing environmental shifts.

The theory emphasizes organizational learning and innovation for developing sustainable business models (Zollo & Winter, 2002). This study explores how sustainable human capital strategies (continuous learning, skill development) enable entrepreneurs to respond and innovate (Jackson & Seo, 2022).

Dynamic capabilities are essential for building and deploying new capabilities (Teece, 2007). In entrepreneurial ecosystems, this means investing in human capital adaptable to new technologies and trends. This paper investigates how sustainable human capital strategies (e.g., green technologies in training) equip entrepreneurs for evolving environments (Chowdhury et al., 2022).

Focusing on resource reconfiguration, the theory highlights the importance of sustainable human capital practices for resilience. This paper discusses how multi-stakeholder collaborations and PPPs can enhance these capabilities for thriving in volatile contexts (Becker, 2020).

4.3. Social Exchange Theory (SET)

Social Exchange Theory (SET) explains relationships between individuals and organizations based on trust and mutual benefit (Blau, 1964). It's relevant for understanding how sustainable human capital strategies foster engagement and innovation (Cropanzano & Mitchell, 2005).

In entrepreneurial ecosystems, these strategies (e.g., inclusive training, green HRM) build trust, enhancing employee engagement and loyalty, leading to higher productivity and innovation (Jackson & Seo, 2022). This study analyzes how these exchanges drive sustainable business practices and growth (Chowdhury et al., 2022).

SET highlights reciprocal exchanges. This paper explores how sustainable practices (skill development, supportive environments) benefit both organizations and employees (job satisfaction, reduced turnover) (Paillé & Mejía-Morelos, 2020), leading to long-term socioeconomic impacts. It investigates how multi-stakeholder collaborations (government, private sector, academia) leverage SET to drive entrepreneurial innovation and enhance ecosystem sustainability (Becker, 2020).

4.4. Green HRM

Green HRM is a critical theory in this paper as it integrates environmental sustainability with human resource management practices (Jackson & Seo, 2022). Green HRM involves policies and practices aimed at fostering environmentally conscious behavior among employees and aligning organizational goals with sustainability objectives. This theory will be used to examine how sustainable human capital strategies, particularly those focused on reducing environmental impact, can support the development of entrepreneurial ecosystems.

Green HRM emphasizes the role of HR in promoting sustainability through policies like energy-efficient workplaces, recycling programmes, and eco-friendly commuting options (Paillé & Mejía-Morelos, 2020). This study will explore how such practices can enhance employee engagement and foster a culture of sustainability within entrepreneurial ventures, thereby contributing to the resilience and adaptability of these ecosystems (Chowdhury et al., 2022). By aligning HR practices with sustainability goals, organizations can drive strategic changes that support long-term growth and development (Teece, 2007). The paper will discuss how sustainable

human capital strategies, such as green HRM initiatives, can help entrepreneurs develop capabilities that are not only economically viable but also environmentally sustainable (Jackson & Seo, 2022).

Green HRM practices can also benefit from public-private partnerships, where governments and businesses collaborate to promote sustainable workforce development (Becker, 2020). This paper will explore how such partnerships can facilitate the adoption of green HRM practices, supporting the creation of resilient entrepreneurial ecosystems (Chowdhury et al., 2022).

5. Methodology

5.1. Research Design

This study adopts a concurrent mixed-methods design, integrating quantitative and qualitative approaches to investigate sustainable human capital strategies and their impact on entrepreneurial ecosystems. This design ensures a balanced understanding of measurable relationships and contextual insights.

5.2. Population and Sampling

The study's population consists of entrepreneurs, HR managers, educators, and policymakers operating within entrepreneurial ecosystems in Southwest Nigeria. The sample includes companies selected from diverse industries across the geopolitical zone to ensure sectoral representation. Specifically, the selected companies are: in the technology sector, LINEXCL Resources and Concepts (Ondo, Ondo State) and Chong FI Limited (Ikorodu, Lagos State); in the food industry, Nourish Food Industry and Supplies Limited (Ondo, Ondo State) and Warm Spring Water Nigeria Limited (Ikogosi-Ekiti, Ekiti State); and in the construction sector, KAD Construction Limited (Ibadan, Oyo State) and A2 Limited (Ondo, Ondo State).

5.3. Sample Size Determination

Using Cochran's formula to calculate the minimum required sample size.

$$n = (Z^2 * p * (1-p)) / E^2$$

Where:

n: is the minimum required sample size.

Z: is the Z-score (95% confidence level: Z = 1.96).

p: is the estimated proportion of the population (0.5).

E: margin of error (0.05).

Substituting values: $n = (1.96^2 * 0.5 * (1 - 0.5)) / 0.05^2$ $n = (3.8416 * 0.25) / 0.0025$ $n = 0.9604 / 0.0025$ $n = 384.16$.

To account for potential non-responses, the sample size is increased by 10%, yielding a total of 425 respondents.

5.4. Sampling Techniques

Stratified Sampling adoption ensures representation from the technology, Food Industry, and Construction sectors.

Purposive Sampling used focused on HR managers, policymakers, and entrepreneurial leaders for qualitative insights.

5.5. Respondents' Demographic Information

Demographics are collected to capture variations across sectors and locations.

Table 1. Respondents Demographic.

Variable	Category	Percentage (%)
Sector	Technology	40%
	Food Industry	35%
	Construction	25%
Gender	Male	65%
	Female	35%
Age Group	18–30 years	20%
	31–45 years	55%
	46+ years	25%
Years of Experience	0–5 years	25%
	6–15 years	50%
	16+ years	25%
Education Level	Secondary	10%
	Tertiary	65%
	Postgraduate	25%

Table 1 presents the demographic characteristics of the respondents across key variables, including sector of operation, gender, age group, years of experience, and educational level. The table indicates that the majority of respondents operate in the technology sector (40%), followed by the food industry (35%) and the construction sector (25%). Male respondents constitute a higher proportion (65%) compared to females (35%). Most participants fall within the 31–45 years age bracket (55%), suggesting an economically active and experienced workforce. In terms of work experience, respondents with 6–15 years of experience dominate the sample (50%), while those with tertiary education form the largest educational category (65%), indicating a relatively skilled respondent base suitable for the study's objectives.

5.6. Data Collection Methods

Data collection for this study employed a mixed-methods approach, combining quantitative surveys, qualitative interviews, and document analysis. Quantitative data was gathered through structured questionnaires containing Likert-scale items, administered both online and face-to-face depending on respondent accessibility. These surveys explored human capital practices (e.g., training programmes, diversity policies), entrepreneurial outcomes (e.g., innovation rates, growth metrics), and sustainability measures (e.g., green HR practices). Qualitative insights were gathered through interviews with key informants from selected companies, including Chong FI Limited, Nourish Food Industry and Supplies Limited and KAD Limited, focusing on the challenges, best practices, and policy frameworks related to sustainable human capital strategies. Finally, document analysis of company reports, training manuals, and HR policies from targeted firms in Southwest Nigeria provided supplementary data.

5.7. Data Analysis

The collected data was analyzed using both quantitative and qualitative methods. Quantitative data was analyzed using descriptive statistics to summarize demographic information and survey responses. Inferential statistics, including regression analysis to test the impact of human capital strategies on entrepreneurial outcomes and ANOVA to compare these strategies across different sectors, were also employed.

Table 2. Regression Output.

Variable	Coefficient (B)	Standard Error	t-Statistic	p-Value
Workforce development	0.48	0.06	8.00	0.000***
Continuous learning	0.35	0.07	5.00	0.000***
Public-private partnerships	0.30	0.08	3.75	0.001**
Sustainability integration	0.28	0.09	3.11	0.002**

Note: Significance Levels: $p < 0.05$ (*), $p < 0.01$ (**).

Table 2 presents the regression results showing the effect of sustainable human capital strategies on entrepreneurial outcomes. The findings indicate that workforce development has the strongest positive influence ($B = 0.48$, $p < 0.001$), followed by continuous learning ($B = 0.35$, $p < 0.001$). Public-private partnerships ($B = 0.30$, $p = 0.001$) and sustainability integration ($B = 0.28$, $p = 0.002$) also show statistically significant positive effects, confirming that sustainable human capital practices significantly enhance innovation, resilience, and performance within entrepreneurial ecosystems.

Qualitative data analysis involved thematic analysis to identify recurring patterns, such as "inclusive workforce policies" and "resilience-building training," and cross-case comparison to highlight sector-specific challenges and innovations.

This study adhered to strict ethical guidelines. Information consent was obtained from all participants before their involvement. Data confidentiality was maintained through anonymization and secure storage protocols. Furthermore, ethical clearance was granted by a recognized institutional review board prior to the commencement of data collection.

6. Discussion of Findings

The study's findings offer significant insights into the role of sustainable human capital strategies in nurturing entrepreneurial ecosystems, particularly within the Southwest Nigerian context. The discussion delves into key themes emerging from the quantitative and qualitative analyses, emphasizing their implications for theory, practice, and policy.

The regression analysis conducted on Workforce Development as a Catalyst for Entrepreneurial Growth revealed a strong positive relationship between workforce development initiatives and entrepreneurial outcomes ($B=0.48$, $p<0.001$). Companies with structured workforce training and development programmes demonstrated higher innovation rates and better operational performance. This finding aligns with Becker (2020) assertion that human capital investments enhance competitive advantage.

In Southwest, Nigeria, firms such as LINIEXCL and A2 Limited that emphasize capacity-building programmes report improved employee productivity and retention. However, qualitative insights highlighted challenges such as inconsistent funding and limited access to advanced training resources, particularly in the agricultural sector. This underscores the need for policies that incentivize continuous learning and subsidize training costs for SMEs in resource-constrained environments.

On Continuous Learning and Lifelong Skill Acquisition, continuous learning emerged as a critical predictor of entrepreneurial success ($B=0.35$, $p<0.001$). Respondents highlighted initiatives such as on-the-job training, e-learning platforms, and knowledge-sharing networks as pivotal for fostering adaptability and resilience.

Companies like Nourish Food Industry and Supplies Limited and Warm Spring Water Nigeria Limited leverage these strategies to maintain competitiveness in dynamic markets. However, the thematic analysis revealed gaps in aligning training content with industry-specific demands. Policymakers and educational institutions must collaborate to update curricula and certifications, ensuring relevance to emerging technologies and market trends.

Regarding the Public-Private Partnerships (PPPs) and Ecosystem Resilience, the study identified public-private partnerships as a significant factor influencing entrepreneurial ecosystems ($B=0.30$, $p=0.001$). Firms with strong collaborations with government agencies, NGOs, and academic institutions reported enhanced access to funding, infrastructure, and technical expertise.

For instance, Warm Spring Water Nigeria Limited collaboration with Ekiti State's development initiatives has bolstered its resource base and market outreach. However, respondents from Nourish Food Industry and Supplies Limited highlighted bureaucratic delays and policy inconsistencies as barriers to effective PPP implementation. Addressing these issues requires streamlined regulatory frameworks and incentives for private-sector participation in public initiatives.

On the part of Integration of Sustainability in Human Capital Strategies, Sustainability integration within human capital strategies showed a significant positive impact on entrepreneurial outcomes ($B=0.28, p=0.002$). Green HR practices, diversity programmes, and inclusive workplace policies were linked to higher employee engagement and innovation rates.

Qualitative data revealed that companies like Warm Spring Water Nigeria Limited have embraced sustainability by incorporating renewable energy practices and promoting gender diversity. However, smaller enterprises struggle with the upfront costs associated with adopting green practices. Financial incentives and training programmes targeting SMEs could bridge this gap, fostering a culture of sustainability across the entrepreneurial ecosystem.

For Sectoral and Demographic Insights, the study's sectoral analysis highlighted nuanced differences in the adoption and impact of human capital strategies:

1. The Technology Firm in Lagos exhibited high innovation indices due to their emphasis on continuous learning and talent acquisition from global pools.
2. Food Industry Sector: Companies in Ondo and Ikogosi-Ekiti reported moderate adoption of green HR practices but cited operational cost constraints.
3. Construction Sector: Enterprises in Ondo and Oyo states demonstrated resilience through community-based training programmes but faced limited technological integration.

Demographically, younger entrepreneurs (18–30 years) showed a higher propensity to adopt innovative strategies, whereas older entrepreneurs (46 years and above) prioritized operational stability. Gender analysis revealed that female entrepreneurs were more likely to implement inclusive and sustainable HR policies, reflecting global trends in gender-sensitive leadership.

6.1. Challenges and Opportunities

While the study revealed positive impacts, several challenges emerged, including inadequate funding, irregular contracts, policy misalignment, and cultural resistance to change. However, significant opportunities exist to further enhance the ecosystem. These include leveraging technology to democratize access to training and resources, especially for rural SMEs; fostering multi-stakeholder collaborations between government, the private sector, and academia to address resource gaps and align objectives; and implementing policy reforms such as simplified regulatory processes and targeted subsidies to accelerate the adoption of sustainable practices.

6.2. Theoretical and Practical Implications

The findings reinforce the relevance of the Resource-Based View (RBV) and Dynamic Capabilities Theory. Human capital, when effectively leveraged, acts as a strategic resource driving innovation and competitive advantage. Simultaneously, adaptability and innovation, as emphasized by dynamic capabilities, are critical for navigating complex and volatile environments.

Practically, the study underscores the need for organizations in Southwest, Nigeria to prioritize sustainable human capital strategies as a core component of their growth models. Policymakers should create enabling environments through targeted policies and incentives, while educators must align curricula with industry demands to nurture a future-ready workforce.

7. Conclusion

The study underscores the pivotal role of sustainable human capital strategies in fostering robust and resilient entrepreneurial ecosystems, particularly in Southwest, Nigeria. By integrating workforce development, continuous learning, public-private partnerships, and sustainability practices, businesses can achieve enhanced innovation, operational efficiency, and long-term competitiveness. The findings validate the theoretical underpinnings of the Resource-Based View (RBV) and Dynamic Capabilities Theory, highlighting human capital as a strategic resource that, when nurtured and adapted, drives both individual firm success and broader ecosystem growth.

Despite significant progress in adopting these strategies, challenges such as limited funding, irregular contracts, policy misalignment, and uneven access to training persist. These obstacles can undermine the full potential of entrepreneurial ecosystems. However, opportunities for technological innovation, multi-stakeholder collaboration, and education-industry alignment provide a pathway for overcoming these barriers and achieving sustainable socio-economic development.

7.1. Recommendations

To maximize the impact of sustainable human capital strategies on entrepreneurial ecosystems, a multi-pronged approach is recommended, encompassing workforce development and training, integration of sustainability practices, strengthened public-private partnerships (PPPs), technology leverage for inclusion, education aligned with industry needs, supportive policy and regulatory frameworks, and robust monitoring and evaluation systems. Specifically, organizations should implement structured, industry-tailored workforce development programs emphasizing continuous learning, leadership development, and technical skill enhancement, while government and NGOs should provide financial incentives (e.g., grants, tax reliefs) to encourage SME investment in employee training and capacity building. Furthermore, businesses should be encouraged to adopt green HR practices (e.g., energy-efficient operations, flexible work policies, diversity programs) to boost employee engagement and innovation, with guidelines and certifications developed to incentivize the adoption of sustainability and inclusivity benchmarks. Strengthening PPPs between government, private firms, and educational institutions is crucial for creating a unified framework for skill development, funding, and infrastructure support, addressing funding gaps, providing access to technology, and developing region-specific training. Technology should be leveraged through e-learning platforms and mobile applications to democratize access to training, particularly for SMEs and rural entrepreneurs, and by encouraging tech-driven innovations (e.g., AI, data analytics) to optimize workforce management. Educational curricula must be revamped to align with industry demands, emphasizing STEM, entrepreneurship, and critical thinking, alongside the introduction of

internships and apprenticeships. Policy and regulatory frameworks should be simplified, with targeted subsidies offered to SMEs adopting sustainable practices, and national policies developed to prioritize inclusive growth, sustainability, and entrepreneurial support. Finally, robust monitoring and evaluation systems should be established to measure the impact of human capital strategies and track ecosystem-wide trends, challenges, and opportunities.

References

- Afolabi, A., Ibidapo, O., & Adegbie, F. F. (2021). Human capital development and the growth of small and medium scale enterprises in Nigeria. *International Journal of Business and Management Review*, 9(2), 64–77.
- Akinola, A. A., Joda, A. E., Aderemi-Williams, R. I., & Amira, C. O. (2023). Medication-related problems among adults with chronic kidney disease in Southwest, Nigeria: A retrospective study. *The Nigerian Journal of Pharmacy*, 57(1), 410–420. <https://doi.org/10.51412/psnnjp.2023.3>
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Becker, G. S. (2020). *Human capital: A theoretical and empirical analysis, with special reference to education*. Chicago, IL & London, UK: University of Chicago Press.
- Blau, P. M. (1964). *Exchange and power in social life*. New York: Wiley.
- Chowdhury, T., Hoque, M. E., & Mia, M. A. (2022). Sustainable human resource management practices and organizational performance: Evidence from Bangladesh. *Sustainability*, 14(16), 10188.
- Cropanzano, R., & Mitchell, M. S. (2005). Social exchange theory: An interdisciplinary review. *Journal of Management*, 31(6), 874–900. <https://doi.org/10.1177/0149206305279602>
- Grant, R. M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. *California Management Review*, 33(3), 114–135. <https://doi.org/10.2307/41166664>
- Iserberg, D. J. (2011). The big idea: How to start a movement, not a company (or ecosystem). *Harvard Business Review*, 89(9), 41–49.
- Jackson, S. E., & Seo, J. (2022). Sustainable human resource management: A review and future directions. *Sustainability*, 14(16), 10118.
- Kumar, V., & Rajan, S. (2021). Public-private partnerships for sustainable development: A review and research agenda. *Journal of Business Ethics*, 171, 1–24.
- Lee, S. M., & Park, G. (2023). Entrepreneurial ecosystems and regional economic growth: A systematic review and research agenda. *Sustainability*, 15(1), 609.
- McGrath, R. G. (2010). Business models for emerging markets. *Harvard Business Review*, 88(6), 104–112.
- Paillé, P., & Mejía-Morelos, J. H. (2020). Green human resource management: A systematic review and research agenda. *Journal of Cleaner Production*, 260, 121020.
- Porter, M. E. (1985). Technology and competitive advantage. *Journal of Business Strategy*, 5(3), 60–78.
- Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350. <https://doi.org/10.1002/smj.640>
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533. [https://doi.org/10.1002/\(SICI\)1097-0266\(199708\)18:7<509::AID-SMJ882>3.0.CO;2-Z](https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z)
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171–180. <https://doi.org/10.1002/smj.4250050207>
- Zhang, X., & Li, Y. (2022). Digital literacy, entrepreneurial orientation and firm performance: The mediating role of human capital. *Sustainability*, 14(16), 10222.
- Zollo, M., & Winter, S. G. (2002). Dynamic capabilities and organizational evolution. *Strategic Management Journal*, 23(4), 339–351.