

Effect of human capital development on agribusiness performance among smallholder rice farmers in Ogun State



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ABSTRACT

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Human capital development is critical for enhancing agribusiness performance, particularly in developing economies where agriculture is a key component of economic activity. Despite numerous capacity-building initiatives aimed at supporting agribusiness growth, agribusinesses still struggle with inadequate skills, training, and continuous learning, which hinder employment generation. This study examines the effect of human capital development on agribusiness performance in Ogun State. A quantitative research method was adopted, utilizing a survey design with a population of 37,200 agribusiness farmers. A sample size of 380 was selected using probability sampling techniques. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), and regression analysis was conducted to test the hypotheses. The results revealed a positive, significant relationship between human capital development and agribusiness employment generation, with an R^2 value of 0.26 indicating a moderate effect on agribusiness performance. The findings establish that continuous learning, adequate skill acquisition programs, and effective training collaborations will lead to employment generation. The study concluded that employment generation in agribusiness is possible through investment in continuous learning, skill acquisition, and training. The study recommended that agribusiness stakeholders should collaborate to implement specialized training programs that promote modern agribusiness practices, thereby enhancing employment generation and sustainability.

Contribution/ Originality: This study is one of the few that has investigated the joint effect of lifelong learning, skill acquisition, and training on employment generation in agribusiness. Unlike prior studies that emphasized skill acquisition and training across diverse sectors, this research highlights lifelong learning and provides new evidence of its role in enhancing performance.

1. INTRODUCTION

Agribusiness is essential to many countries' economic development, especially in developing economies in Africa such as Nigeria, Ghana, Egypt, and Zambia, where agriculture continues to contribute significantly to GDP and job creation (Berndt, Gomes, & Borini, 2024). In Nigeria, agribusiness is not only a means of guaranteeing food security, but it also has the ability to diversify the economy and reduce poverty. Ogun State, with its strategic location and fertile soil, serves as an important centre for agricultural operations and agribusiness firms. Despite these advantages, the agricultural sector faces a number of obstacles, including low productivity, restricted access to current technology, insufficient financing, and a shortage of competent workers. These difficulties are aggravated by the inadequate development of human capital, which is crucial for boosting the performance of agribusinesses in

the state. Human capital development, which includes education, training, and skill acquisition, is critical to increasing workforce productivity and accelerating economic growth. In the context of agribusiness, well-trained and talented workers are required to utilize current farming techniques, leverage novel technologies, and implement effective agribusiness practices (Nwabuatu, 2024). However, in Ogun State, many smallholders' agricultural businesses and workers lack access to essential skills and resources to reach their full potential.

This disparity in human capital development affects the sector's capacity to reach its full potential and contribute meaningfully to the state economy. Despite the state's extensive agricultural resources and suitable environment, Ogun State's agribusiness performance has remained unsatisfactory (Adamu, Ibrahim, Bidda, & Suleiman, 2025). One of the primary causes of this underperformance is the sector's insufficient human capital development. Many agribusiness operators and workers among smallholders have limited access to formal education, technical training, and capacity-building efforts, resulting in an ineffective workforce (Abolade, Lawal, Akanbi, & Salami, 2024). This lack of human capital development has an impact on many elements of agribusiness performance, such as productivity, profitability, employment generation, and sustainability. Low agricultural yields, for example, are caused by a lack of awareness of contemporary farming practices, whilst limited managerial skills impede effective decision-making and resource allocation. Furthermore, the lack of continuous training and development programs exacerbates the problem, leaving smallholders unprepared to react to shifting market dynamics and technological improvements (Fubah & Moos, 2021).

Addressing this issue is critical to maximizing agricultural potential in Ogun State. By investing in human capital development, stakeholders may provide the workforce with the skills and knowledge required to increase productivity, implement new solutions, and achieve long-term growth. The purpose of this study is to investigate the effect of human capital development on agricultural employment generation in Ogun State, with a focus on how lifelong learning, skill acquisition, and training influence agribusiness employment generation.

2. LITERATURE REVIEW

2.1. Human Capital Development

Human capital development is defined as deliberate attempts to cultivate human resources through education, skill acquisition, continuous training improvement, and other capacity-building programs (Becker et al., 2022). It emphasizes not just the acquisition of knowledge and skills, but also the development of creativity, adaptability, and resilience in individuals. HCD is important for both macroeconomic growth and microeconomic results since it influences organizational productivity and national development indices (Yue, Javvaji, Tang, Makinwa, & Du, 2023). Human capital refers to individuals' aggregate capabilities, which comprise their knowledge, skills, and health, and are required for effective participation in society. Human capital development is thus defined as the purposeful investment in these characteristics in order to maximize individual and organizational potential (World Bank, 2023). This approach aspires not only to improve individual competencies but also to develop a more adaptable and innovative workforce capable of tackling the difficulties of a fast-changing economic landscape (TalentHC, 2023).

Developing human capital is the systematic process of equipping individuals with knowledge, skills, and competencies through formal education and training to enhance productivity and economic outcomes (Deming, 2022). Similarly, it describes a multidimensional approach that includes education, health, and lifelong learning to improve an individual's ability to contribute meaningfully to economic and social progress (Alinia et al., 2022). In the view of Kuzmin, Boldyrev, and Maltsev (2023), human capital development is the ongoing improvement of individual and organizational capabilities through education, health interventions, and skill acquisition. In addition, human capital development is the strategic investment in people to drive innovation, competitiveness, and sustainable economic development (Haque, Bakshi, & Mobin, 2021). Nabi & Samina (2023) viewed human capital development as enhancing workplace competencies through vocational training, mentorship, and experiential

learning programs. In a similar vein, HCD is a set of policies and initiatives aimed at improving access to quality education and healthcare, with the ultimate goal of reducing inequalities and improving economic growth (World Bank, 2023). Similarly, human capital development is the process of enhancing social and economic participation by increasing individual capabilities in health, education, and employment (Chaudhary, Magar, Sah, & Parajuli, 2020). Rodríguez-Fernández et al. (2023) suggested that human capital development promotes lifelong learning and adaptation, allowing individuals to function effectively in dynamic labour markets. In support of the above claim, human capital development is the practice of enhancing workforce capabilities through targeted training and development programs, driving innovation, and improving organizational efficiency (Smith & Jones, 2022). Finally, HCD is an important factor in global competitiveness, necessitating investments in education systems, healthcare infrastructure, and skill-building activities to prepare a country's workforce for the present and, most importantly, the future (UNESCO, 2024).

2.1.1. Dimensions of Human Capital Development

Human capital development has several facets, each contributing to the overall increase in individual and social productivity. These dimensions include education and training, health, skill development, lifelong learning, as well as social and economic inclusion (Nwabuatu, 2024). However, in this study, lifelong learning, skill acquisition, and training were used to determine the impact of human capital development on employment generation.

2.1.1.1. Education and Training

Education and training are the foundations of human capital development, serving as the major means by which people acquire knowledge, improve critical thinking, and develop problem-solving abilities that are necessary for personal and economic progress. Education is critical in providing students with the intellectual and practical capabilities necessary to navigate and prosper in a constantly changing economic environment. According to Deming (2022), education is the backbone of human capital since it enables people to adapt to changing economic landscapes and technological breakthroughs. This adaptability is vital in meeting the challenges posed by globalization and the Fourth Industrial Revolution, in which skills like creativity, critical thinking, and technological proficiency are increasingly valued (Fijabi, Oladapo, & Kareem, 2024).

Education promotes not only the development of certain cognitive capacities but also improves social mobility and overall societal advancement (Deming, 2022). Furthermore, formal education and occupational training are critical components of this dimension. Fubah and Moos (2021) argue that education should be matched with the practical demands of the labour market, ensuring that learners acquire useful and marketable skills. Vocational training, in particular, fills the gap between theoretical knowledge and its application in real-world settings. It allows individuals to focus on specialized professions, increasing their employability and output. The authors also claim that investing in education and vocational training yields major economic benefits, such as increased productivity, decreased unemployment rates, and long-term economic growth.

In addition to economic benefits, education has a transforming effect on personal and societal growth. It promotes a sense of agency, allowing people to make educated decisions and actively participate in societal and economic activities. Furthermore, education systems that promote inclusion and lifelong learning ensure that people from all socio-economic levels have opportunities to increase their skills and knowledge, resulting in a fair and productive society (Kansheba, 2020). The use of digital technology in education and training has increased its efficacy. Online learning platforms, digital technologies, and e-resources have increased access to excellent education, especially in areas where traditional educational infrastructure is scarce. These improvements have not only enhanced educational accessibility but have also provided novel teaching methods that promote interactive and adaptive learning (Roma, 2022).

2.1.1.2. Skills Acquisition and Lifelong Learning

Skills acquisition and lifelong learning are key components of human capital development, enabling individuals to adapt to the quick pace of technological innovations and the changing character of work and markets. In an era marked by globalization and technological disruption, continual learning guarantees that individuals and organizations stay competitive, resilient, and capable of navigating economic and social landscapes. [Aboobaker, Renjini, and Zakkariya \(2023\)](#) propose lifelong learning as a strategic method to prepare individuals for turbulent labour markets. They emphasized that lifelong learning not only promotes flexibility but also resilience, helping people to embrace change and exploit new possibilities ([Berndt et al., 2024](#)). This method entails a dedication to acquiring new knowledge and skills at all stages of life, whether through official schooling, informal learning, or on-the-job training. [Toki, Padonu, and Tairu \(2023\)](#) emphasized the value of workplace training and mentorship programs in maintaining high employee performance. They affirm that focused training efforts allow employees to gain specialized abilities in response to industry demands, hence increasing productivity and organizational efficiency. Furthermore, mentorship programs offer opportunities for experiential learning, in which less experienced individuals get insights and direction from more experienced professionals, promoting skill transfer and capacity building.

The use of digital technologies in learning processes has further transformed skill acquisition. Individuals can access a wide range of learning resources using online platforms and e-learning tools, allowing for self-paced and flexible learning.

According to [Soto \(2024\)](#), the emergence of digital learning has democratized access to education and training, allowing people from all walks of life to gain vital skills without regard for geography or economic status. This has been effective in providing workers with digital literacy and technical abilities, which are increasingly in demand across all industries. Furthermore, lifelong learning promotes the development of soft skills such as problem-solving, teamwork, and effective communication, all of which are required for success in complicated professional settings. These skills supplement technical competencies and improve overall employability because they are highly recognized by employers in both traditional and developing industries ([Sarudin, Abdullah, Razak, Razak, & Ahmad, 2024](#)). The importance of agribusiness stakeholders in creating a culture of continual learning cannot be emphasized enough. Policies and efforts that encourage upskilling and reskilling, such as training programs, subsidies, or collaborations with educational institutions, play an important role in providing the workforce with the capabilities necessary to compete in a fast-changing environment ([UNESCO, 2024](#)).

2.1.2. Agribusiness and Employment Generation

Employment creation is the process of providing new job opportunities within an economy, which increases the number of people actively engaged in productive work ([Lekan-Akomolafe, 2023](#)). Similarly, job creation is described as the supply of employment opportunities, with a focus on alleviating the issues that unemployed people face ([Guerrero, Liñán, & Cáceres-Carrasco, 2021](#)). Furthermore, employment generation includes actions that provide immediate, short-term possibilities with a high effect, as well as programs that promote sustainable lives in both the private and public sectors ([United States Institute of Peace, 2023](#)). It is a dynamic process that is directly related to a country's economic structures and processes, demonstrating its ability to adapt and grow ([Francisca Nkechi Nwaodume & Udeh Romanus, 2023](#)). It is also recognized as a key driver of economic development, particularly contributing to poverty reduction and long-term economic growth ([Nwabuatu, 2024](#)). The procedure is critical for promoting economic growth by creating jobs in various sectors of the economy ([Adamu et al., 2025](#)). Furthermore, it entails developing job opportunities that increase employment rates and lower unemployment, thereby improving social and economic stability ([Mohammed, Usman, Kojoli, & Ikeh, 2024](#)). Establishing new businesses, growing current industries, adopting government regulations, attracting foreign investment, and promoting entrepreneurial ventures are all ways to create jobs ([Nwabuatu, 2025](#)). It is critical to socioeconomic development, helping to reduce

poverty, boost economic growth, and improve general well-being (Joseph, Sankar, Benny, & Nambiar, 2023). Similarly, employment creation is crucial for raising household incomes, increasing domestic demand for goods and services, and promoting economic resilience and growth (Oguh & Iriogbe, 2025).

Agribusiness, which combines farming with the processing, marketing, and distribution of agricultural goods, is an important vehicle for job creation, particularly in emerging nations. The industry not only improves food security, but it also generates jobs throughout the value chain, from primary farming to complex agro-industrial operations. Recent research emphasizes its vital role in lowering unemployment and promoting economic growth, particularly among youth and rural people. For example, Udodiugwu and Eneremadu (2023) argue that agricultural programs aimed at youth have greatly increased prospects for self-employment and entrepreneurship, addressing persistent unemployment issues in developing countries. These views highlight the relevance of policies and initiatives that incorporate youth into agriculture value chains in order to maximize employment outcomes.

Agribusiness employment generation includes both on-farm activities such as agricultural production and livestock rearing, and off-farm activities such as processing, storage, and logistics. According to Olayemi, Adeola, and Yusuf (2023) the sector's potential to create jobs originates from its diverse value chain, which includes both skilled and unskilled labour. In *Nigeria*, for example, programs like the Youth-in-Agribusiness initiative and N-Power Agro have proven the effectiveness of focused interventions in establishing long-term employment. These initiatives have offered participants training, funding, and market connections, allowing them to launch viable agribusiness ventures. As a result, participants not only find work but also contribute to rural economic development, lowering poverty and migratory pressures in urban regions.

The integration of technology and innovation is a critical aspect in the creation of jobs in the agricultural industry. Mechanization, precision farming, and agro-processing technology have increased productivity while also creating specialized professions that require technical skills. According to studies conducted by the International Food Policy Research Institute (IFPRI) (2023), the use of digital tools in agribusiness has created new job opportunities in areas such as drone operations, data analytics, and mobile-based agro-advisory services. These technological improvements have expanded the scope of agribusiness, making it more appealing to educated young people who are often hesitant to participate in conventional farming.

2.2. Theoretical Review

2.2.1. Human Capital Development and Agribusiness Employment Generation: A Human Capital Theory Perspective

Becker et al. (2022) developed human capital theory, which states that investments in education, training, and skill development increase individual productivity and economic performance. This idea is especially applicable in the agricultural industry, where skilled labour is required at all stages of the production, processing, and distribution value chain (Mihai & Rusu, 2022). The relationship between human capital development and employment generation in agribusiness emphasizes the significance of education and skill development for sector growth and job creation. Human capital development is critical for increasing agricultural productivity, which leads to more job opportunities in the agribusiness sector. Olayemi, Badu, and Mensah (2023) emphasized that vocational training in modern farming techniques, such as crop management and machinery use, leads to greater output. This increase in output raises the demand for additional labour in the primary (farming) and secondary (processing and marketing) sectors of agribusiness, resulting in more job possibilities. As agribusinesses grow, the demand for competent personnel rises, promoting job creation (Akpan & Onuoha, 2022). In line with human capital theory, education also plays a vital role in fostering entrepreneurship within the agribusiness sector. Akinwumi, Adeyemi, and Olabisi (2023) suggest that agricultural entrepreneurship programs providing training in business management, agricultural economics, and financial literacy help individuals gain the necessary skills to start and sustain agribusiness ventures. Equipped with these skills, entrepreneurs are more likely to innovate, invest in technologies, and enhance productivity, which stimulates employment. As agribusinesses grow, they generate not

only direct jobs but also indirect ones in the value chain, contributing to the wider economy (Ogunlela, 2024). Another area where human capital development promotes job creation in agriculture is technological adoption. Ifeanyichukwu, Eze, and Chukwuma (2023) contend that training is critical to overcome barriers to the adoption of modern agricultural technology such as precision farming and IoT-based systems. Farmers and agribusiness professionals who receive training can use these technologies more efficiently, resulting in higher productivity and labour demand in production, logistics, and processing. Thus, human capital development promotes the adoption of technology while growing the labour market in the agro industry.

The efficiency of the agribusiness value chain is likewise dependent on trained labor at all stages, from production to distribution. Okechukwu and Olanrewaju (2022) argue that human capital development is essential for optimizing the value chain. Agribusinesses require specialized expertise in areas such as food safety, quality control, and logistics to function properly. As agribusinesses become more specialized and develop, the demand for skilled people rises, creating additional job opportunities along the value chain.

Finally, human capital theory provides a solid framework for analyzing the relationship between skill acquisition, training, lifelong learning, and employment generation in agriculture. The literature clearly demonstrates that human capital development through vocational training, entrepreneurial education, technology adoption, and value chain optimization drives job creation. Aligning human capital development with agricultural demands allows the sector to fully realize its potential as a substantial contributor to employment generation and economic growth.

2.3. Empirical Literature

In a study conducted by Olayemi, Adeola, et al. (2023) they found that vocational training significantly enhanced the skills of farmers, leading to higher productivity and job creation in farming and agribusiness support sectors in Sub-Saharan Africa. This study emphasizes the role of practical skill development in improving agricultural outcomes, which aligns with the human capital theory. However, it focuses solely on vocational training and does not address the broader context of entrepreneurship or technological adoption, which could also play a role in employment generation. Its findings suggest a direct link between skill development and job creation, but it lacks comparison with other training models, such as those integrating technology or entrepreneurship education.

The findings from the study of Akinwumi et al. (2023) found that agricultural education in *Nigeria* encouraged individuals to establish agribusinesses, which created rural jobs. Olayemi, Badu, et al. (2023) this study highlights the entrepreneurial aspect of human capital development, focusing not just on farming skills but also on business management and financial literacy. While both studies emphasize the importance of human capital development through education, Akinwumi et al. (2023) explore its broader impact on entrepreneurship, making it more comprehensive than Olayemi, Badu, et al. (2023) which only focuses on vocational training. However, it lacks a deep exploration of technological skills, which could have further enhanced agribusiness outcomes, most importantly agribusiness employment generation.

The findings of Ifeanyichukwu et al. (2023) explored the role of technology adoption facilitated by human capital development through training, leading to increased job opportunities. This study introduces the dimension of technological advancements, which is an area not addressed by Akinwumi et al. (2023) nor Olayemi, Badu, et al. (2023). It shows that the combination of human capital and technology can lead to job creation, particularly in advanced agribusiness sectors. However, while the study's emphasis on technology adoption is valuable, it could have incorporated the challenges that farmers face in accessing these technologies, which could influence the overall effectiveness of the training and its impact on employment generation.

Establishing the findings of Oguh and Iriogbe (2025) found that agricultural entrepreneurship training enhanced entrepreneurial skills and led to the creation of agribusiness ventures and jobs. This study aligns with

Akinwumi et al. (2023) by emphasizing the entrepreneurial aspects of human capital are considered, with an emphasis on a rural context where training specifically benefits small-scale agribusinesses. While this focus on entrepreneurship provides insight into rural job creation, the study does not consider technological integration as a complement to entrepreneurship training, which could have enhanced its findings.

In another study conducted by Mihai and Rusu (2022), they emphasized that vocational training programs enhance technical skills, boosting productivity and creating jobs in the agribusiness value chain. This study focuses on vocational training but extends the scope to include multiple stages of the agribusiness value chain. The study offers a broader view of vocational training's impact across various agricultural sectors, differing from Olayemi, Badu, et al. (2023), which primarily concentrated on farming and agribusiness support. However, it does not consider the integration of technological skills. The position of Akpan and Onuoha (2022) demonstrated that human capital development through skill training led to agribusiness growth, particularly in processing and logistics, resulting in job creation. This study takes a more specialized approach by focusing on specific sectors within agribusiness, namely processing and logistics, whereas other studies such as Olayemi, Badu, et al. (2023) and Akinwumi et al. (2023) took a broader view, by focusing on a specific segment of the agribusiness value chain, it provides detailed insights into how skill development can foster job creation in niche areas, though it lacks a broader look at agricultural production itself.

Olayemi, Badu, et al. (2023) found that skills development programs improved smallholder farmers' management abilities in Ghana, leading to job creation in smallholder-led agribusinesses. Similar to the study in International Monetary Fund (2023), this research focuses on skills development but emphasizes its impact on smallholder farmers rather than agribusiness workers. This distinction is important because smallholder farmers typically face different challenges compared to larger agribusiness enterprises, and the findings highlight the importance of tailored programs. However, the study does not examine technological advancements or entrepreneurship, areas that could have enhanced its conclusions.

The study conducted by Okechukwu and Olanrewaju (2022) focused on how agricultural innovations, supported by training, contributed to employment generation in post-harvest processing and distribution in Nigeria. This study differs from others by linking human capital development to specific innovations in agriculture, such as improved post-harvest techniques, which weren't covered in studies like Akinwumi et al. (2023) or Olayemi, Adeola, et al. (2023). It provides a more specialized insight into how technological advancements, when coupled with skill development, can enhance employment. However, the study could have explored how these innovations are integrated with broader agricultural practices. Ige and Ajayi (2024) found that education in agribusiness-related fields led to better job opportunities and higher wages. This study emphasizes the importance of formal education over vocational or entrepreneurial training. The key distinction here is the focus on educational interventions rather than practical training programs, which are the primary focus of other studies like Olayemi, Adeola, et al. (2023) or Mihai and Rusu (2022). While it adds to the literature by highlighting the role of formal education, it could have considered the benefits of combining educational programs with practical or technological skills training. Ifeanyichukwu et al. (2023) demonstrated that technology training contributed to employment generation by enhancing tech-driven farming techniques in Uganda. This study introduces an aspect of agribusiness development that is underexplored in other studies, namely the role of technology in employment creation. While other studies like Olayemi, Adeola, et al. (2023) and Akinwumi et al. (2023) emphasize vocational training or entrepreneurship; this one adds a modern twist by focusing on technology. However, it lacks a broader contextual understanding of the challenges in adopting these technologies in rural settings.

3. METHODOLOGY

This study investigated the effect of human capital development on agribusiness employment generation in Ogun State, focusing on rice farmers under the umbrella of the Rice Farmers Association of Nigeria (RIFAN). 380

respondents were chosen from a population of 37,200 rice farmers through probability sampling, using simple random selection procedures. Primary data was used as a source of data; a questionnaire was constructed to collect data. However, quantitative analysis was performed to assess the extent to which explanatory variables (*Lifelong learning, Skill acquisition & Training*) influence the given variable (*Employment generation*). PLS-Sem was utilized for data analysis, and regression and path measurement were investigated.

3.1. Model Specification

To examine the effect of human capital development on agribusiness employment generation in Ogun State, this study employed a quantitative approach using Partial Least Squares Structural Equation Modeling (PLS-SEM). The model is specified as follows:

$$EG = \beta_0 + \beta_1 HCT + \beta_2 CTL + \epsilon \quad (1)$$

Where:

EG = Employment Generation (Dependent variable).

HCT= Human Capital Training (Skill acquisition and training).

CTL = Continuous Learning.

β_0 = Intercept.

β_1, β_2 = Coefficients of explanatory variables.

ϵ = Error term.

3.2. Demographic Profile of the Respondents

The profile of the respondents was analyzed using their demographic characteristics in terms of gender, age, educational status, and years as members of farmers' associations.

Table 1. Demographic profile.

Items	Frequency	Percentage (%)
Gender		
Male	192	50.5
Female	188	49.5
Total	380	100%
Age		
Between 25-35	161	42.4
Between 36-45	133	35.0
Between 46-55	86	22.6
Total	380	100%
Educational status		
Agric- education	82	21.6
Primary	90	23.7
Secondary	110	28.9
Post-secondary	98	25.8
Total	380	100%
Years as a member of RIFAN		
6-10 yrs.	141	37.1
11-15 yrs.	195	51.3
16-20yrs	44	11.6
Total	380	100%

Table 2 revealed that out of the 380 valid responses used in this study, 192 (50.5%) were male, while the remaining 188 (49.5%) were female. This indicates that the number of females in agribusinesses is increasing and also depicts women's inclusiveness in agribusiness participation. The number of respondents by gender reflects the

total number of males and females involved in agribusinesses in Ogun State. Additionally, of all the 380 respondents, 161 (42.4%) are aged 25-35 years, 133 (35.0%) are between 36-45 years, and 46-55 years account for 22.6% Table 1. The data also shows that 82 (21.6%) of the respondents have agricultural education; 90 (23.7%) possess primary school certificates, while 110 (28.9%) have secondary school certificates. Furthermore, 98 (25.8%) of the total valid questionnaires indicate post-secondary education. The study reflects that the human capital index is relative but not yet at a high significant level. Additionally, 141 (37.1%) are members for 6-10 years, 195 (51.3%) for 11-15 years, and 44 (11.6%) for 16-20 years.

4. TEST OF HYPOTHESES

4.1. Hypothesis One: Human Capital Development and Employment Generation

H_{01} : Human capital development has no significant effect on employment generation.

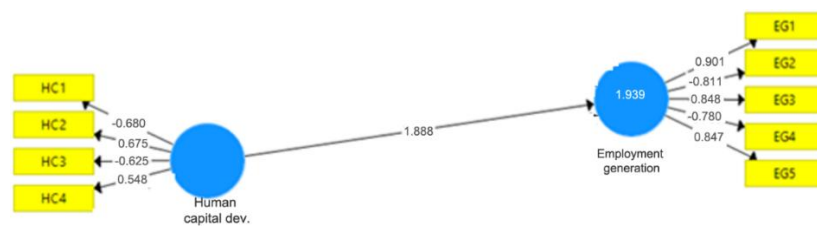


Figure 1. Measurement of variables.

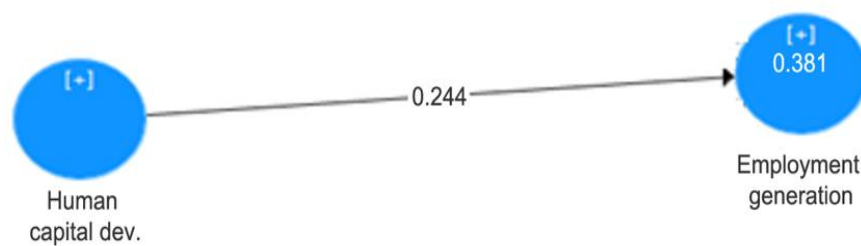


Figure 2. Measurement model (Algorithm testing).

Figure 2 illustrates the positive relationship between human capital development and employment generation, with a path coefficient of 0.244. This indicates that improvements in human capital development significantly enhance agribusiness employment opportunities.

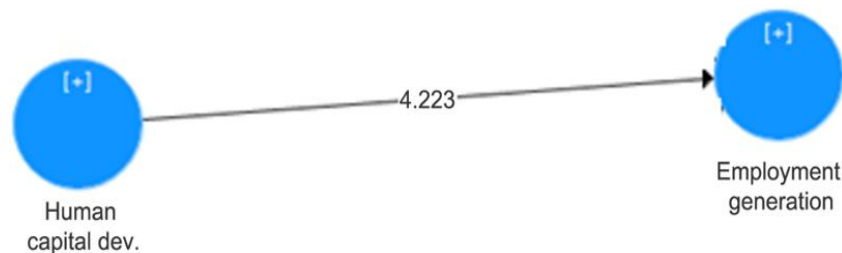


Figure 3. Structural model (Bootstrapping @5000) Employment generation.

Figure 3 illustrates a direct positive relationship between human capital development and employment generation. The diagram shows that as human capital development increases, it positively affects employment generation, with a quantified impact represented by the coefficient value of 4.223. This suggests that improvements in human capital development substantially enhance the generation of employment opportunities.

Table 2. Structural model result for the Employment generation.

Construct	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Human capital dev -> Employment generation_	0.244	0.260	0.070	3.507	0.000

In Hypothesis one, the SEM results indicated that human capital development (*Lifelong learning, skill acquisition & training*) is positively related to employment generation. The result (Table 2, Figure 1) shows a significant positive relationship between human capital development and employment generation, with ($\beta = 0.260$, $t = 3.507$, $p < 0.000$), supporting the alternative hypothesis. The findings reveal a significant positive relationship between human capital development and employment generation, evidenced by an original sample value of 0.244 and a sample mean of 0.260. The standard deviation of 0.070 and a T-statistic of 3.507 further substantiate the significance of this relationship. With a p-value of 0.000, the results establish a positive statistical significance, indicating that investments in human capital development effectively contribute to employment generation. Empirical literature aligns with this finding, highlighting the crucial role of human capital in enhancing employment generation. For instance, Adegbite and Akinwale (2023) emphasized that skill acquisition programs significantly increase employability, particularly among youth in developing economies. Similarly, a study by Akpan and Onuoha (2022) found that targeted training programs in technology-driven sectors had a profound impact on reducing unemployment rates by equipping participants with relevant industry skills needed for agribusiness. Furthermore, research by Okafor (2024) demonstrated that human capital initiatives not only enhance individual capabilities but also stimulate entrepreneurial ventures, thereby expanding job opportunities across various sectors. These studies collectively establish the pivotal influence of human capital development in mitigating unemployment and reducing agribusiness unemployment generation.

5. CONCLUSION AND RECOMMENDATIONS

The findings of this study establish the importance of human capital development in improving employment generation within the agribusiness sector. The original sample value of 0.244, coupled with a statistically significant p-value of 0.000, provides strong evidence that investments in human capital development are instrumental in agribusiness employment generation.

These results align with recent empirical literature, which emphasizes the transformative effect of skill acquisition, targeted training, and continuous learning on employment generation. Consequently, the study concludes that investment in human capital serves as a strategy for addressing unemployment challenges and promoting sustainable development, particularly within the agribusiness industry.

To enhance the effect of human capital development on agribusiness employment generation, it is recommended that stakeholders actively collaborate to implement specialized training programs tailored to the specific skill demands of agribusiness value chains. These programs should emphasize modern agricultural practices, technology adoption, and entrepreneurial skills to prepare individuals for emerging opportunities in the sector.

Additionally, policies should be developed to support continuous learning and development for agribusiness farmers and workers, ensuring they remain adaptive to evolving industry trends and technologies, as this will encourage long-term employment sustainability.

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Institutional Review Board Statement: The Ethical Committee of Kwara State University, Nigeria has granted approval for this study on 4 June 2024 (KWASU/ACAD/095/VOL.XI/082). All participants were fully informed of the study's objectives, procedures, and their rights. Participation was entirely voluntary, and participants could withdraw at any stage without penalty. Written informed consent was obtained prior to data collection. To ensure confidentiality, all personal identifiers were removed, and responses were anonymized.

Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

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.

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