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Research Paper

Influence of Knowledge Sharing, Innovation Capacity, Firm Performance in Nigerian Agro-clusters

Isiaka Kolawole Mustapha[1*], Olalekan Busra Sakariyau[2], Mercy M Adeyeye[3], Abdul Falilat Ajoje[4]

[1,2,3] Federal University of Technology, Nigeria

[4] Organization of Islamic Cooperation, Saudi Arabia

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Abstract

Collaboration and cooperation among entrepreneurs and enterprises have created strategies to improve well-being and create sustainable businesses to foster regional development. Therefore, this paper investigates the relationship between knowledge sharing, innovation and socio-economic growth of micro, small and medium enterprises (MSMEs) in Nigeria's rabbit farming e-clusters space. The web survey method was adopted by employing five Likert scale questionnaires through social media platforms respondents. 78 valid respondents were collected from MSMEs in rabbit farming e-clusters. The hypothesis was tested using the structural equation modelling (SEM) approach. The finding suggests knowledge sharing, innovation capacity, and firm performance positively influence the socio-economic growth of rabbit farmers in e-cluster. Social media platforms, including WhatsApp, Facebook and Telegram, prove that farmers not in the same geographical location are not a barrier to the benefit of clusters. This study proposes that knowledge sharing, innovation capacity and firm performance within an e-cluster improved the socio-economic growth of farmers. The acceptance of a physical-less business cluster that would reduce the rural-urban migration of agribusiness can be achieved. This study contributes to the literature on knowledge transfer, innovation and firm performance in e-cluster rabbit farming. A new dimension to the Industrial Cluster model by adapting to a virtual agglomeration of business and social media platforms.

Keywords: *e-Cluster; Rabbit Farming; Innovation; Knowledge Sharing; Agribusiness; Socio-economic Growth*

INTRODUCTION

Over the years, micro, small and medium enterprises (MSMEs) have developed a variety of strategies and initiatives to improve socioeconomic growth and sustainable business through cooperation with other businesses within the same geographical location, line of business and/or operate in the same sector. Such initiatives are aggressive industrial and innovative drives in Asian countries (Morozova et al., 2017), especially for microfinance and cooperative strategies (Lopatta and Tchikov, 2015; Ibrahim et al., 2021) and industrial cluster (Wardhana et al., 2020, Ketels & Protsiv, 2021).

The concept of the business cluster has received global interest in the past few years. It was first popularised by Michael Porter, a management scholar, in 1990 (Lehman and Menter, 2017), and he described a cluster as a geographical concentration of businesses connected by the heterogeneity of products, suppliers of input and output and specialised services. The recognition and attention given to the concept of business cluster formation are closely related to micro, small and medium enterprises (MSMEs) development (Andriuschenko et al., 2020) and socio-economic growth (Meihua and Shanyong, 2013).

Academic research has documented the positive relationship between industrial clusters and socioeconomic growth through knowledge sharing, innovation and social capital (Kim and Shim, 2018; Leonardo et al., 2020; Wardhana et al., 2020). Leonardo et al. (2020) assert that sharing of knowledge has a positive relationship with business clusters' performance and sustainability. Also, clusters are a major player in creating an enabling environment where innovation and

Corresponding author's email: mikola0507@yahoo.com

innovative activities thrive (Mo et al., 2020). The socioeconomic growth of SMEs has been described to include activities that improve the welfare of a community or region through employment creation, income, healthcare, housing and population (Caraka et al., 2021).

However, the continuous changes in technological development in the business space and the wide spread of usage of different aspect of the internet has created business-to-business network such as e-clusters which has increased business proximity digitally (Adebanjo et al., 2006). Previous research has focused on the adoption and development of e-cluster (Adebanjo et al., 2006; Kim and Park, 2015), critical success factors in e-clustering (Fu et al., 2017) and regional integration (Bangura, 2018). Interaction, collaboration and information sharing among entrepreneurs have significantly increased more than ever before due to the advent of social media structure (Naneetha, 2018: Mazza and Palermo, 2018). Social media platforms, such as WhatsApp group (Naneetha, 2018; Sixto-García et al., 2021), Facebook (Taylor et al., 2012; Mazza and Palermo, 2018) and Instagram (Akbar, 2021) are said to create opportunities for an increase in knowledge sharing, information on new technology usage, targeted advertising and engagement (Mazza and Palermo, 2018) where entrepreneurs and MSME owners collaborate for sustainability.

This study is justified by the identified gaps in the literature on e-cluster and, therefore, will address the following research questions. Firstly, is there exist a positive relationship between knowledge sharing and the socio-economic growth of farmers in clusters? Secondly, is there exist a positive relationship between innovation capacity and the socio-economic growth of farmers in clusters? And lastly, is there exist a positive relationship between firm performance and the socio-economic growth of farmers in clusters? (Kim and Shim, 2018). It is expected that the findings of this research will provide more information on the benefit of social media platforms in the socio-economic growth of businesses in Nigeria, especially in greenfield enterprise of rabbit farming. Our findings contribute to the sustainability of agro MSMEs sustainability through knowledge sharing and innovation development and the theory of business clusters in agribusiness.

LITERATURE REVIEW

Theory of Business Cluster and Rabbit Farming Enterprises

Although the concept of the cluster was first discoursed by Alfred Marshal (1890), who used the term "industrial district" in his book titled *Principle of Economics* to describe the advantages of locating businesses in the same geographical area, industrial districts described the inter-connected manufacturing firms, particularly in specific locations where organisations benefit from knowledge spillover and innovation processes (Bettiol *et al*., 2017). The notion explained that businesses were clustered in the same location due to the input-output relationships that exist (Li *et al.*, 2019).

Porter (1998, p. 78) described an industrial cluster as "*a geographic concentration of interconnected companies and institutions in a particular field".* More recently, Vernay *et al*. (2018) perceived clusters as a regional assemblage of related business sectors or value chains and other service institutions in a specific location to collaborate and derive economic benefits. Enterprises operating in the same locality or the same industry experience similar opportunities and challenges (Ghayoomi *et al.*, 2020), and this clustering could be a result of voluntary collaboration among agribusiness (Wardhana *et al.*, 2020). Cluster contributes to the development of the agribusiness sector through the collaboration of stakeholders (Otsuka and Ali, 2020; Shakib, 2020; Perkins *et al*., 2021), resulting in an increase in trust and knowledge (Leonardo *et al.*, 2020) and vital to a reduction in poverty, employment creation, food sustainability and wealth creation (Wardhana *et al.*, 2017; Achoja and Enwa, 2019; Pereira *et al*., 2020: Mustapha *et al.,* 2021).

Beyond physical collaboration, technological advancement has enabled enterprises spread across different locations to digitally collaborate and corporate using the internet, thus creating

business e-clusters (Adebanjo *et al.*, 2006). Fu *et al.* (2017) define e-cluster as enterprises carrying out similar businesses that are interconnected digitally or virtually but are geographically dispersed using the advancement in information technology devices such as the internet and mobile services to improve healthy business rivalry and impact positively on the economic development of their business and region. This is possible by using the combination of industrial cluster characteristics and e-business functionality into play to enhance competitiveness (Kim and Park, 2015).

Rabbit farming is a subsector of the livestock industry and can be viewed as a fast-growing farming business in Nigeria that requires little capital outlays (Idowu and Busari, 2022). Rabbit agribusiness has created entrepreneurial skills and increased employment among women, young people and adult farmers. This micro livestock sector has been seen to have the potential to improve income and the standard of life among farmers (Akinsola *et al.,* 2021; Idowu and Busari, 2022). The ventures allow farmers to combine rabbit farming with other business ventures, especially students (Okpakpor and Olorunsogbon, 2020). Many MSMEs in this subsector abound, offering services such as cage making, feed production, meat processing, fur/pelt processing and marketing.

Akinsola et al. (2021) noted that the rabbit breeding system of farming was introduced in early 1960 by the United State Department of Agriculture (USDA), facilitated by the government agency – The Directorate of Food, Road and Rural Infrastructure (DFFRI). Rabbit farming has been growing steadily ever since to produce easily digestible meat, pelt production and manure processing. In a bid to increase awareness of the benefits of the rabbit business and facilitate an increase in sales, farmers have resulted in the use of e-channels on social media (Facebook, WhatsApp, and Instagram) (Idowu and Busari, 2022). This has created collaborative, cooperative as well as healthy competition among farmers. This act has created many groups on WhatsApp and Facebook that could be termed e-clusters.

Business Cluster and Knowledge Sharing

Knowledge is the mental state of an individual to understand their immediate environment, that is- the state of being in the know (Zagzebski, 2017). Schmidt *et al*. (2016) and Ibidunni *et al*. (2020) described knowledge as the bye product of data after processing into information, thereafter, assimilated by an individual through the effort of combining information with experience. Zagzebski (2017), Tomasello (2021) and Ferretti and Zipoli Caiani (2021) noted that this knowledge could be direct (knowledge acquittance) or indirect (propositional knowledge). Propositional knowledge is a form in which knowledge can be transferred or shared between individuals through communication or actions. Ibidunni *et al*. (2020) asserted that different dimensions of knowledge management include knowledge sharing, knowledge transfer, knowledge creation, knowledge capture and application of knowledge.

On the concept of the business cluster, Teixeira and Oliveira (2017) assumed knowledge to be in the air, that information available within the cluster environment creates enabling environment for easy duplication of businesses that are related to existing enterprises. Hoffman *et al.* (2014) note that a business cluster creates an environment that facilitates the transfer of technological knowledge for the easy introduction of new businesses and products. Tedja (2022) averred that knowledge is an intangible resource that could be used to create a competitive advantage for an organisation. Agro-cluster institutions promote the socioeconomic growth of businesses within the cluster through knowledge-sharing resources (Hoffman *et al.*, 2014: Bittencourt *et al*., 2019: Leonardo *et al*., 2020). Hoffman *et al*. (2014) posit that the transfer of knowledge in clusters is a multi-dimensional process of education; different dimensions may be combined in the process of knowledge transfer, and the process can occur in the absence of interfirm cooperation. Although agribusiness knowledge is not always obtained from academic

classrooms from such places as the community and the internet (Hermawan *et al.,* 2022). While the physical proximity of clusters allows for flexibility in the knowledge transfer process, the similarity of the knowledge base is provided for by cognitive proximity (Teixeira and Oliveira, 2017: Ogunjemilua et al., 2020). Bittencourt *et al*. (2019) noted that location is not the main driver but the social network formed within and outside the cluster. Leonardo *et al*. (2020) concluded that knowledge of the new process and product technology acquired by farmers is a prerequisite for the socioeconomic growth of agro-cluster. Hence, social media can be an efficient enabler of knowledge transfer within the rabbit e-cluster.

Business Cluster and Innovation Capacity

Innovation is described as the employment of new or improved processes to produce goods or services, the creation of new markets or marketing methods, and better ways of the factor of production utilisation (Bittencourt *et al.*, 2019). The process of knowledge sharing within an industrial cluster by related enterprises enables individuals and businesses to rapidly gain advanced technology knowledge, thereby creating an enabling environment for creativity (Meihua and Shanyong, 2013). Saether (2014) claimed that the ability to effectively and efficiently replicate direct and indirect knowledge for competitive advantage is hinged on the innovation capacity of clusters. In this study, innovation is perceived as a change in ways of doing things through new processes or updating existing processes within the agribusiness environment.

Innovation is the key to the socio-economic growth of a nation, company or individual. Innovations are better ways to indulge in the combination of ideas, assets, technologies, value chain and logistics that links businesses and industries with no prior relationship. As competition widens and new technology surfaces, innovative activities are birthed (Dilaver *et al.*, 2014; Chandrashekar and Subrahmanya, 2017; Mustapha *et al*., 2021). Industrial clusters are a vehicle that creates the right atmosphere that facilitates innovative activities through the promotion of a social network of businesses and entrepreneurs that are stakeholders in the cluster (Meihua and Shanyong, 2013; Chandrashekar and Subrahmanya, 2017; Mo *et al.,* 2020). The use of the cluster is an approach used, especially by policymakers, to drive up the socio-economic growth of a region (Yu et al., 2013; Li *et al*., 2019) and to generate enough depth, scale and diversity of innovation to compete on an international level and compete favourably (Garone *et al.*, 2014: Ai *et al.*, 2020).

Consequent to these, innovation is conceptualised as having both new technological progress and new method of service delivery of existing agro-allied businesses (science innovation investments). Regardless that agribusiness is moving towards digital agribusiness (Mustapha *et al*., 2022), which suggests many science innovation investments in the developing nations, examining both variables will provide a holistic view of ground-breaking activities within rabbit agro-cluster in Nigeria.

Business Cluster and MSME Performance

The Federal Government of Nigeria has shown a willingness to diversify the Nigerian economy by way of increasing funding access to agribusiness. Paul *et al.* (2017) noted agribusiness is the main source of creating wealth and consists of many small business units in developing countries. Also, these SMEs are the catalyst for economic development and are drivers to improve the condition of income inequality, poverty rate and unemployment. Agro-cluster increases social interaction that, enhances members' income and improves the productivity of farmers (Wardhana *et al*., 2020). Agricultural sustainability and the protection of food security depends largely on the competitiveness of agribusiness, and cluster formation has been an important tool in this direction through different economic policy and agricultural reform (Dorzhieva *et al.,* 2015; Hakimovich e*t al.,* 2020). Ketel and Prostsiv (2021) submit that cluster development strengthens regional

prosperity and economic development. In line with this positive correlation that exists, Sultan (2014) posits that there is a positive significant relationship between small and medium enterprises' performance and agro-cluster. Collaborative and cooperative actions in the spatial concentrated agricultural business region can lead to enhancement in farmers' wealth and socio-economic growth.

Socio-economic Growth

The concept of socio-economic growth provides us with an understanding of the social status of farmers in rabbit farming businesses. Social status is seen as a blend of the relationships that exist between people's cultural, social and economic circumstances, which influences people's behaviour and personality (Rubin *et al*., 2014). Baker (2014) described socio-economic growth as the social and commercial process that is directed at improving the social and economic values of an individual, people, and/or a region through a policy-making process.

Socio-economic status is measured using such variables as education level, income, employment status, level of production, and access to finance (Ivanova *et al*., 2017). In creating a conducive and sustainable environment, MSMEs have been seen to play a major role, especially through the creation of jobs and enhancing developmental growth (Bakari and Saidu, 2021). However, it has been noted that the industrial cluster is one of the best and most effective policy mechanisms used in improving the socio-economic growth of MSMEs for regional development (Sultan, 2014; Abdin, 2016) and for economic sustainability (Lee *et al.,* 2017). Industrial clusters provide an avenue for the transfer of knowledge among various stakeholders through interaction and cooperation, especially micro, small and medium-sized enterprises (Jankowiak, 2018). Transferring knowledge within the cluster provides the basis for increased employment in a specialised skill and as well creates a sustainable environment for innovation. This type of agglomeration environment aims at developing high-growth firms (Temouri *et al*., 2020) and then leading to economic growth that is mutated based on the geographical location of the cluster (Chen *et al.,* 2018).

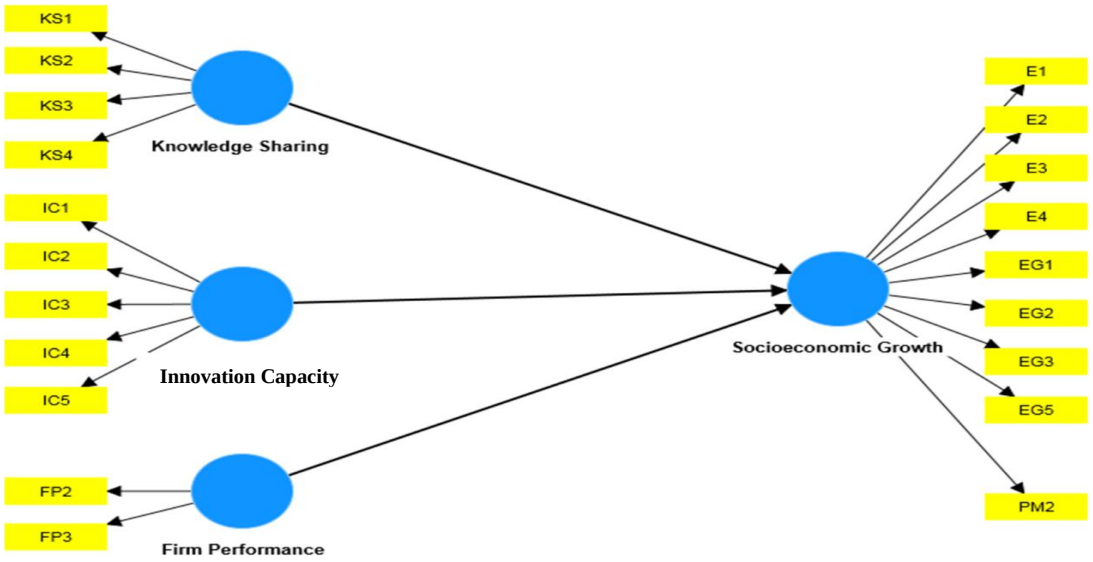
Hypothesis Development

Using the Porter (1998) industrial cluster analysis that there exists inherent benefit in the business cluster, the following objectives and hypotheses were formulated:

Objective 1. To investigate the influence of knowledge sharing among e-cluster on the socio-economic growth of rabbit farmers.
H1: There exists a positive influence of knowledge sharing on the socio-economic growth of rabbit farmers.

Objective 2. To investigate the influence of innovation capacity among e-cluster on the socio-economic growth of rabbit farmers.
H2: There exists a positive influence of innovation capacity on the socio-economic growth of rabbit farmers.

Objective 3. To investigate the influence of firm performance among e-cluster on the socio-economic growth of rabbit farmers.
H3: There exists a positive influence of firm performance on the socio-economic growth of rabbit farmers.



Note: *KS represent knowledge sharing; IA represents Innovation Capacity; FP represents Firm Performance; E represents Education; EG represents Employment Generation; and PM represents Improved Welfare.*

Figure 1. Measurement Model of the Knowledge Sharing, Innovation Capacity, Firm Performance on Socio-Economic Growth

Therefore, business clusters have been empirically tested to significantly improve socio-economic growth through knowledge sharing, innovation capacity and firm performance. Hence, the influence of knowledge sharing, innovation capacity and firm performances on socio-economic growth within the cluster will be tested in this article.

RESEARCH METHOD

This study was carried out in Nigeria, using the association of rabbit farmers registered online because this agribusiness venture represents a greenfield using the social medial platform for communication with customers and other stakeholders. The study employed the Partial Least Square- Structural Equation Model to test the relationships of the variables. The data for the study were collected from 71 business enterprises in rabbit farming/marketing operating with a social media presence in Nigeria. This study on agribusiness in rabbit farming and social media is justified because of the increase in digital agriculture (DA) awareness across the world for food security and sustainability. The population sample will provide information on the volume of rabbit farmers in the virtual business space in comparison with the estimated number of rabbit farmers in Nigeria, which was put at 3- 5% of the Nigerian population (Abu *et al.,* 2008).

Measurement

The study employed measurements adapted from previous studies to measure the dimensions of variables on a five-point Likert scale for each item, starting from strongly agree to strongly disagree. Specifically, knowledge sharing (KS), firm performance (FP), and innovation capacity (IA) were measured using variables adapted from Hoffman *et al.* (2014) and Kim and Shim (2018). The measurement of education (E), employment generation (EG) and improved welfare (PM) as a driver of socioeconomic growth were adapted from Kim and Shim (2018) and Salau *et al.* (2019). The constructs and variable measurements of this research are presented in Table 1.

Table 1. Measurement of Research Variables

Constructs	Items
Factor 1: **Knowledge Sharing** – 4 items	The cluster encourages alliance among agribusinesses within the group
	There exists an opportunity for the exchange of resources within the cluster.
	Learning best practices in farming is possible.
	Businesses within the group are exposed to training and workshop.
Factor 2**: Innovation capacity –** 5 items	Innovative activities are encouraged within the group discussion.
	Expanding production lines in all rabbit value-chain is encouraged.
	We identify new market segments through the group.
	Adoption of the latest technological innovations is encouraged.
	I believe if I have challenges, other farmers will try to help me out.
Factor 3**: Firm Performance -** 3 items	Members benefit from increased marketing and promotional channels.
	Businesses within the group have enjoyed a high rate of returns on investment.
	Trade fairs and exhibitions to promote produce are available – locally and internationally.
Factor 4: **Socio-economic Growth –** *12 items*	Farms within the cluster are able to compete on quality and standard.
	The activities within the group have led to the formation of different businesses.
	The activities within the cluster provide support that aids employment generation for the people in the community.
	Job creation arose as a result of growth and development within the Rabbit cluster.
	The group create opportunity for members to learn from other members.
	The activities of the group provide valuable information for business development.
	Relationships and networking enhance the ability to learn new things.
	The platform provides an opportunity to share business experiences.
	Rabbit agribusiness is able to compete in value creation.
	Rabbit agribusiness has more chances of creating more employment in the economy.
	Farm businesses are able to compete on price.
	The leadership of the group offer training support that encourages cluster development.

Data Collection

The questionnaire was administered through the Google form and shared through the WhatsApp rabbit groups that represent the e-cluster, Facebook rabbit groups in Nigeria, as well as on Telegram. In order to achieve the objective of the study, the length and complexity of the questionnaires are reduced without losing focus. This takes care of the reservation raised by Žmuk (2017) on the web questionnaire. Secondly, in a bid to increase the response rate, repeated reminders and the link to the survey were shared weekly, as advised by Oishi *et al.* (2017) and Saunders *et al*. (2019). The questionnaire responses were reviewed, and blank responses, 14 (15%) were removed. Thus, 78 responses were successfully recognised and used for this study. All the geopolitical zones in Nigeria were represented except the North East due to insurgencies.

Data Analysis

Partial Least Square- Structural Equation Modelling (PLS-SEM) is used to measure the relationships (*See Figure 1)*. This is due to its flexibility in handling complex models with many constructs without imposing assumptions (Wong, 2013: Hair *et al.,* 2019). The SmartPLS 4 SEM software was used for the analysis.

FINDINGS AND DISCUSSION

The raw data collected after being subjected to examination and assessment is in line with the opinions of Saunders *et al.* (2019), who held that this is necessary to ascertain the completeness, consistency and accuracy of the respondents. Hence the need to remove the 14 responses with blank responses in some of the questions.

Demographic Profile of the Respondent

The respondents' profiles were analysed using the characteristics embedded in the questionnaire in terms of gender, age, educational status, occupational position, the group the respondent belongs to and the number of years as a member of a cluster.

Table 2. Demographic Profile

Items	Frequency	Percentage (%)
Sex		
Male	59	76%
Female	19	24%
Total	**78**	**1.00**
Age Group		
16 – 25	4	5%
26 – 35	14	18%
36 – 45	35	45%
46 – Above	25	32%
Total	**78**	**1.00**
Years in Rabbit Farming Venture		
Below 5 years	40	51%
5 - 10 years	28	36%
11 -15 years	4	5%
16 - 20 years	2	3%
Above 20 years	4	5%
Total	**78**	**1.00**
Cluster Group		
Facebook	9	12%
Telegram	3	4%
Whatsapp	63	81%
Others	3	4%
Total	**78**	**1.00**

Source: Authors' Survey

Table 2 depicts that out of the 78 responses, 59 (76%) were male, while the remaining 19 (24%) were female. Also, of the 78 respondents, 4 (5%) were 16 – 25 years old, 14 (18%) were 26 – 35 years, 35 (45%) were 36-45 years, and 25 were above 46 years and above. This is an indication that despite the increased awareness and policies to attract more women and the younger generation into agribusiness for food and sustainability, the effect has not been shown in rabbit farming.

The respondents' years in rabbit farming shows that 40 (51%) have been in the business for less than five years, 28 (36%) have 5-10years experience, 4 (5%) have 11-15years, 2 (3%) have 16-20years and 4 (5%) have above 20 years experience. As a member of the social media group, members of WhatsApp group are 63 (81%), Facebook cluster - 9 (12%) and Telegram and Others Cluster are 3 (4%). This demographic index confirms the report by Statista (2022) that WhatsApp is the most used social media platform in Nigeria and that the concept of a cluster is still at the blossoming stage in Nigeria.

Measurement Model

This research employed PLS-SEM 4 for the analysis of data collected based on two-staged evaluation criteria (Hamza *et al.,* 2019; Pulka *et al.*, 2021). The study evaluates each construct's reliability, convergent, discriminant validity and collinearity statistics (Kim and Shim, 2018; Hair *et al.,* 2019). One variable was deleted out of twenty-four (24) variables in the datasets; this is because the variable's loading value is below the threshold of 0.40, as suggested by Ertz *et al.* (2016). Although, a loading of 0.70 and above are recommended (Hair *et al.,* 2019; Pulka *et al.*, 2021). Twenty-three items were measured for the main analysis of this research (Table 3).

Reliability and Validity

The Reliability of the constructs is measured to check for the consistency of the measure. This is to check for the internal consistency and reliability of the datasets while the validity checks the accuracy (Hair *et al.,* 2019). The constructs' reliability and validity were calculated using Cronbach's alpha, composite reliability and average variance extracted (AVE) (see Table 3). Cronbach's alpha for all the constructs met the threshold of 0.70. The composite reliability also surpasses the minimum 0.6, as recommended by Fornell and Larcker (Lam, 2012). This is indicated in Table 3. This is an indication that the variables used have a higher level of internal reliability. The average variance extracted is more of a conservative approach to measuring the validity of the model and has a recommended level of 0.5 (Lam, 2012; Hair *et al.,* 2019). The variables met this condition except for SEG which is 0.468; however, with a high value of 0.912 in composite reliability measurement, the convergent validity is acceptable for all the constructs.

Discriminant Validity

Hair *et al.* (2019) and Pulka *et al.* (2021) stated that discriminant validity checks that construct measurements are not related or correlated in any form. In establishing the distinctive nature of each construct, Kim and Shim (2018) and Hair *et al.* (2019) suggested that the construct loading should be higher than the corresponding cross-loadings (Table 5) and based on Fornell and Larcker recommendation, the discriminant value of the construct should be higher than any other value below it (Table 4).

Table 2 presents the variable loadings for each item, the reliability and validity construct based on Cronbach's alpha, composite reliability and average variance extracted (AVE)). Table 4 and Table 5 depict the discriminant validity based on Fornell-Larcker and Cross-loadings, respectively.

Table 3. Item Loading, Reliability and Validity

	Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	VIF
Socio-economic Growth		0.889	0.910	0.533	
E1	0.793				2.730
E2	0.787				2.760
E3	0.772				3.372
E4	0.811				3.363
EG1	0.673				2.365
EG2	0.716				2.600
EG3	0.754				2.518
EG5	0.600				1.646
PM2	0.630				1.532
Firm Performance		0.700	0.868	0.767	
FP2	0.845				1.409
FP3	0.908				1.409
Innovation Capacity		0.894	0.922	0.704	
IC1	0.775				1.930
IC2	0.870				2.648
IC3	0.838				2.336
IC4	0.847				2.492
IC5	0.862				2.616
Knowledge Sharing		0.728	0.830	0.552	
KS1	0.707				1.405
KS2	0.776				1.564
KS3	0.665				1.377
KS4	0.814				1.506

Source: Authors' Survey

Note: *KS represent knowledge sharing; IA represents Innovation Capacity; FP represents Firm Performance; SEG represents Socio-economic Growth; E represents Education; EG represents Employment Generation; and PM represents Improved Welfare.*

Table 4. Discriminant Validity - Fornell-Larcker criterion

	FP	IC	KS	SEG
FP	**0.876**			
IC	0.561	**0.839**		
KS	0.458	0.764	**0.743**	
SEG	0.587	0.772	0.740	**0.730**

Source: Authors' Survey

Note: *KS represent knowledge sharing; IA represents Innovation Capacity; FP represents Firm Performance; SEG represents Socio-economic Growth; E represents Education; EG represents Employment Generation; and PM represents Improved Welfare.*

Table 5. Discriminant Validity – Cross-Loadings

	Firm Performance	Innovation Capacity	Knowledge Sharing	Socio-economic Growth
E1	0.327	0.576	0.638	0.793
E2	0.302	0.667	0.678	0.787
E3	0.334	0.651	0.684	0.772
E4	0.388	0.576	0.662	0.811
EG1	0.520	0.439	0.342	0.673
EG2	0.505	0.525	0.522	0.716
EG3	0.444	0.491	0.442	0.754
EG5	0.488	0.381	0.340	0.600
FP2	0.842	0.487	0.341	0.444
FP3	0.908	0.498	0.451	0.572
IC1	0.408	0.775	0.694	0.568
IC2	0.449	0.870	0.725	0.713
IC3	0.470	0.838	0.559	0.642
IC4	0.568	0.847	0.587	0.681
IC5	0.452	0.862	0.646	0.620
KS1	0.478	0.482	0.707	0.532
KS2	0.240	0.554	0.776	0.518
KS3	0.266	0.574	0.665	0.459
KS4	0.367	0.654	0.814	0.661
PM2	0.596	0.671	0.439	0.630

Source: Authors' Survey

Note: *KS represent knowledge sharing; IA represents Innovation Capacity; FP represents Firm Performance; E represents Education; EG represents Employment Generation; and PM represents Improved Welfare.*

Testing of Hypothesis

The result of the relationship between Knowledge Sharing (KS), Innovation Capacity (IC) and Firm Performance on Socio-economic Growth (SEG) was tested, and the result is shown in Table 6. The hypothesis results show that FP, KS and IC have a positive and significant direct relationship with SEG. Figure 3 explains that a 68.0 per cent change in socio-economic growth can be accounted for by the combination of KS (35.0%), IC (39.1%) and FP (20.3%). These are greater than 10%, as recommended by Kim and Shim (2018)

The result from Table 5 showed that the relationships are positively significant as all the t-values are greater than 0.5. Therefore, all the hypotheses are accepted. There exists a strong and positive relationship between Knowledge sharing and socio-economic growth, a strong and positive relationship between innovation capacity, and the relationship between firm performance and socio-economic growth in the rabbit social medial cluster is also strong and positive. These affirm the importance of industrial clusters, as postulated by Porter (1998).

Table 6. Result of Structural Equation Modelling

	Relationship	Beta *(β)*	Standard Deviation	T statistics	P values	Hypothesis Decision
H1	FP => SEG	0.203	0.096	2.109	0.035	Supported
H2	IC => SEG	0.391	0.144	2.714	0.007	Supported
H3	KS => SEG	0.350	0.122	2.869	0.004	Supported

Note: Significant level at 5%; *KS represent knowledge sharing; IC represents Innovation Capacity; FP represents Firm Performance; SEG represents Socio-economic Growth; E represents Education; EG represents Employment Generation; and PM represents Improved Welfare.*
Source: Authors' Survey

Discussion

This research focuses on the aspect of agro-cluster on social media platforms made up of entrepreneurs, SMEs and apprentices providing goods and services within the rabbit farming value chain. The aspect of geographical proximity in agro-clusters has been expanded to include collaborations not limited to a locality or location, as the technology has created a new opportunity in the business cluster. Though several studies have been conducted on the advantages of being a member of a business cluster, the social media interaction of SMEs in a cluster is less examined, especially in rabbit farming, by previous research. Therefore, this study investigates the relationship between agro-clusters, knowledge transfer, innovation capacity, firm performance and socio-economic growth.

The measurement model result reveals that there exists a reliability and validity model as the factor loading for each item is between 0.600 and 0.870, which is above the recommended threshold of 0.5. Although, items EG4, PM1, PM3, and FP1 were rejected because of a low loading factor below 0.600. The construct reliability and validity are also strengthened. The Cronbach's Alpha for all the latent constructs is between 0.70 and 0.89, which meets the recommended minimum figure of 0.7 (Fauzi, 2022). Using the Fornel-Larcker criterion for discriminant validity as shown in Table 3, which tests the uniqueness of the construct from each other. Hair *et al*. (2021) specified that discriminant validity is achieved when the square root of the AVE of a construct is larger than its correlation with other constructs. The average variance extracted (AVE) also meet the cut-off mark of 0.5 for all the construct. Therefore, the reliability and validity of the items are not in doubt.

Table 6 presents the result of the structural model and establishes that there exists a relationship between KS, IC, FP and SEG. The p-value is all less than the 0.05 threshold. The relationship between knowledge sharing (KS) and socio-economic growth is said to be significantly positive ($\beta = 0.350$, $t = 2.869$, $p < 0.004$). The beta is greater than 0.20, and the t-statistic is also greater than 1.96, as recommended (Latif *et al.,* 2020). The influence of innovation capacity on socio-economic growth is significantly positive ($\beta = 0.391$, $t = 2.714$, $p < 0.007$). The results supported the conclusion by Meihua and Shayong (2013) that knowledge sharing and technology innovation can promote regional economic growth as an intermediary between clusters and economic growth. Also, it affirms the conclusion that innovation significantly influences the competitive advantage of MSMEs (Pasaribu *et al*., 2021). However, the influence of firm performance may be said to be weak and not significant, as the mean is close to 0.2 and the p-value is not far from 0.05 ($\beta = 0.203$, $t = 2.109$, $p < 0.035$). The firm performance construct is a new introduction to the frame of these variables.

The findings reveal that knowledge sharing, innovation capacity and firm performance all have a positive impact on socio-economic growth as an agent of e-cluster under the banner of

industrial cluster theory. The findings authenticate the importance of business clusters as explained by previous researchers (Yu *et al*., 2013: Kim and Shim, 2018: Achoja and Enwa, 2019: Wardhana *et al*., 2020: Temouri *et al*., 2020; Pereira *et al*., 2020: Mustapha *et al.,* 2021b). Also, social media platform groups on WhatsApp, Facebook, Instagram and others can significantly improve information sharing on rabbit farming businesses and provide sustainable enterprises. Creating social networking group or cluster increases knowledge sharing and transfer among rabbit farmers' stakeholders, providing an opportunity for innovative activities and avenues for improved business performance.

CONCLUSIONS

This study, therefore, validated that MSMEs in rabbit farming enterprise within e-clusters benefit from being a member through knowledge sharing and innovative activities that enhances firm performance. These benefits of knowledge sharing that create opportunities for creative, innovative activities provide sustainability through firm performance. It enhances competitive advantage for business or regional development, as explained by Industrial Cluster Theory. It further validates Porter's theory of business cluster. It also provides other alternatives to the physical location, which is a main feature of the theory. Virtual or digital cluster represent the new normal, especially after the COVID-19 pandemic that restrict physical contact or interactions. Therefore, MSMEs, especially rabbit farmers in Nigeria that joined a social media group such as WhatsApp, Telegram, and Facebook, will benefit from knowledge sharing, information on innovative activities and improved performance, which can position the business for a positive competitive advantage. The findings offer business owners/investors the opportunity to leverage social media and internet networking in creating sustainable businesses.

Theoretical Implications

This research adopted the industrial cluster theory to explain the collaborative activities of SMEs that are bounded by the same business but are geographically dispersed in order to examine its impact on knowledge, innovation and performance of enterprises. This study addresses social media-based SMEs' networking approach in adapting the industrial clusters' characteristics to create sustainable enterprises. Other implications of this study are: 1) The study expands the scope of the previous study in clusters to include social media agro-clusters in rabbit farming. 2) scientific findings to contribute to the body of knowledge and existing literature in the industrial cluster. 3) this study provides an empirical shred of evidence from a developing sector in agribusiness. 4) The research provides an understanding of the impact of KS, IC and FP on socio-economic growth.

Methodological Implications

This study employs the use of a web questionnaire as a data collection method. Empirically, the study has contributed to the understanding of the use and application of the web-based questionnaire in developing nations such as Nigeria. This could further help researchers, academics and other stakeholders in deepening knowledge of the use of web-based data collection methods, especially the “z generation” that is known for the Nano computer age.

Empirically, the study has contributed to the importance of the e-cluster model in enhancing the socio-economic development of rabbit farmers without the physical location sensitivity. Hence, it provides policymakers with an economical avenue for sharing knowledge resources among farmers as well as improving firm performance.

Practical Implications

The findings of this study suggest that agro-cluster rabbit farming can create sustainable enterprises by building on the collaborative effort of farmers by supporting MSMEs through knowledge sharing and innovation that will enhance healthy rivalry in the business. Social media networking plays a critical role in bringing together MSMEs in the same business sector or value chain with no location hindrance. This may translate to a reduction in rural-urban exodus and facilitate rural development, easy access to the market and current trend innovation within rabbit farming ventures.

LIMITATION & FURTHER RESEARCH

E-clustering model has increased business proximity digitally (Adebanjo *et al.,* 2006) and improved healthy and competitive rivalry that impact positively on the economic development of the farmers (Fu *et al.*, 2018). However, this study focuses only on the rabbit farming cluster in Nigeria. There is a need for future research to examine e-cluster in other sectors of the economy. Also, there is a need for further research on the formation, structure, and management of e-cluster, the role of stakeholders within the e-clusters and the role of policymakers. Another limitation is the overall focus of this study on the knowledge transfer observation without segregating different types of knowledge. Future studies may explore the different types of knowledge-sharing models within e-cluster. This also relates to other constructs (innovation and firm performance).

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