

ENTREPRENEURSHIP AND INNOVATIVE CAPACITY AMONG AGRIBUSINESS CLUSTERS IN NORTH-CENTRAL, NIGERIA

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Abstract

The themes of entrepreneurship and agribusinesses have continued to echo with a wide range of initiatives around the country. Additionally, the economic instability, resource limitations and environmental uncertainties call for entrepreneurial initiatives as the option for agribusinesses to attain synergy. More so, the innovative prowess in the agricultural sector in Nigeria raises concerns about low attempt at salvaging agricultural sector from its present status. Hence, the study examined the relationship between entrepreneurship and innovative capacity among agribusiness clusters in Kogi, Kwara and Niger States of Nigeria. The study samples were selected using multistage sampling techniques and 342 copies of questionnaire were administered. The data was analyzed using Smart PLS-Structural Equation Modeling (SEM) technique. The results revealed that entrepreneurial initiatives have significant relationship with innovative capacity among agribusinesses. From the study, it was established that networking initiative (T statistics =5.628), technological adoption (T statistics = 4.478), and entrepreneurial orientation (T statistics =5.912) were essential elements in ensuring innovative capacity. The study thus concluded that entrepreneurial initiatives have strong positive relationship with innovative capacity. The study recommended that technological advancement through research and development and conscious collaboration with relevant institutions should be encouraged.

Keywords: Entrepreneurship, Innovative capacity, entrepreneurial technology and Agribusiness

Introduction

Entrepreneurial initiatives (EI) are not new in the developed world, as they are conspicuous and have universal features of today's economy; there are many incidents of successful initiatives from developed economies around the world. As a concept, EI has become a framework of support with documents devoted to realising the European Union (EU) coherent policy. This is an indication that governments worldwide regard entrepreneurship as potential drivers of development and innovation. Initiatives are also considered to be effective policy

instruments which allow for concentration of resources and funding in targeted areas with a high growth and development potential that can spread beyond the target locations (Pavelkova, Jircikova, Knapkova & Saha, 2011).

Consequently, the United States of America (USA) and other EU countries have recognised that promotion of entrepreneurial initiatives such as Public Private Partnership (PPP), networking, technological usages, guided by values and principles are considered as fundamental pillars of national and international socio-economic developments. For instance, World Bank (2012) asserts that the success of high performance businesses are largely as a result of initiatives such as networking to achieve results, collaboration with stakeholders, alliance with community and cooperation with competitive elements (coopetition). Such initiatives would not only hold for tangible production, but could also be an excellent starting point for many industries.

The strength of any region is its ability to cultivate and grow new enterprises as these entrepreneurial businesses can tap into a wealth of knowledge and form relationships simply by choosing to locate alongside other related businesses. As a result of rapid and sustained growth, developed economies have been quick to support the development of agriculture garnished with entrepreneurial initiatives. Gunawan, Jacob and Duysters (2013) as well as Ogundele and Jiyah (2017), also suggest that businesses with higher entrepreneurial orientations tend to perform better because of the continued changes in the economies, political landscape, technologies and other environmental factors that provide the flow of potential opportunities.

Entrepreneurship programmes have become noticeable tools for fostering innovation and growth of competitive private sector in developing countries, like Nigeria, Ethiopia, Kenya, Ghana and Egypt amongst others. Although, the conventional model of cluster focuses on firms located alongside similar businesses to benefit from networks, specialised infrastructures and economies of scale. Nonetheless, the Nigerian models have taken an evolutionary approach to analysing cluster formation. Specifically, clusters arise in the form of agglomeration of cooperatives organisations comprising of various similar SMEs. Agribusinesses are predominantly common in Africa and are mostly in traditional and labour-intensive; in rural and poor urban areas (Merima, Olivier, Holger & Adnan, 2017; Elena, Alexander, Elena, Viktor, Elena, & Nadezhda, 2015). Abdulazeez, Ajonbadi and Otokiti (2014) also note that all over the world, governments are increasingly turning their attention to supporting the globalisation of agribusinesses in order to

increase international competitiveness. Beyond this, successful agribusiness clusters are technically competent, innovative and plan ahead to steer their ventures through the stages of enterprise development from establishment and survival to rapid growth and maturity. For agribusinesses to cope with the risks in the complex world which they compete, they need to develop entrepreneurial spirits. Businesses with entrepreneurial spirits energetically, enthusiastically and carefully make different decisions about production in the context of the value chain that influences the efficiency of the firms.

The fact that reports from World Bank, (2012); Reardon, Barrett, Berdegué and Swinnen (2009); Zeng (2008) suggest the potentials for agribusiness to stimulate growth in farmers' incomes, foster sustainable increases in crop yields and support market chain expansion, it also contributes to socio economic development goals of the country. Although, cluster development in the agricultural sector, which constitute the bedrock of the Nigerian economy has not been given needed priority by policy makers, it had been identified as a veritable means to set Nigeria's economy on a path of rebirth and recovery. Conscious initiatives and actionable plans must therefore be in place to enhance agribusiness performance. Agreeably, agriculture is essential to Nigeria's quest for economic diversification and survival (Economic Growth Recovery Plan [EGRP], 2017) as many states have considerable comparative advantages based on their natural endowments. Furthermore, agriculture can form the foundation for industrial park, just as the production of silicon transistors, laid the groundwork for the biggest concentration of high-tech companies in the world now known as the Silicon Valley. It is against this background that this study examined the entrepreneurial initiatives and innovative capacity among agribusiness clusters in North-Central, Nigeria.

Literature Review

Entrepreneurial initiatives are specific and actionable programmes undertaken to achieve specific objectives in the short run, such objectives include reduced cost, increased efficiency and improved performance among several others (Ogundele & Ijiya, 2017). Also, entrepreneurial initiatives when observed from integrated view required actionable steps that enable the firms to get along with people, customers, employees, government and regulating officials (Sajuyigbe, Madu-Igwe, & Unachukwu, 2016). It involves the actionable programmes required for entrepreneurial success which enables the entrepreneurs to motivate and excite employees, investors, customers and other stakeholders about the business. Successful entrepreneurs are passionate about their underlying businesses as well

as the abundant opportunities within the environments. Kusumawardhani, McCarthy and Perera (2009) highlight initiatives such as networking, adoption of technology, business orientation and collaboration as being essential in business.

Networking Initiatives (NI)

Kusumawardhani, McCarthy and Perera (2009); Awang, Ahmad, Asghar, Subari & Kassim (2011) assert that network plays significant role in influencing the entrepreneurial process. Entrepreneurship initiatives reveal the essence of business as the ability to detect, willingness to pursue and exploit the opportunities in the marketplace (Oviatt & McDougall, 2005). Yet, not all entrepreneurs have the capabilities and sufficient resources to utilise those opportunities. They need collaboration with the economic actors to enable them to carry out some activities in order to gain access to resources and markets (Gunawan, Jacob, & Duysters, 2013). They further argue that businesses seek to improve their competencies by establishing new network ties and existing networks. Entrepreneurs within the firms need to develop networks in businesses to consolidate on existing opportunities and also to exploit new opportunities (McCann & Folta, 2011). As a result, Merima, Olivier, Holger & Adnun(2017) agree that entrepreneurship is obviously a networking activity. Network initiative within the business is considered as an important asset because it provides access to powerful information, knowledge, technologies, and capital (Christopher, 2012; Inkpen & Tsang, 2005; Elfring & Hulsink, 2003).

Also, Chatterji, Edward, and William (2013); Sawyer, Mcgee and Peterson (2003) identify two broad categories of nature and sources of network relationships; (1) personal networks or informal networks, and (2) business networks or organisational networks. The former refers to informal relationships that involve relatives, friends, and acquaintances (Lawal, Adegbuyi, Iyiola, Ayoade & Taiwo, 2018; Flower, 2008). The latter is concerned with relationships between actors that control business activities, such as customers, distributors, suppliers, competitors, and government. In the same vein, Lawal, et al (2018) suggest that informal networks can provide small firms with a more stable stream of information and advice. Similarly, Inmaculada (2015) observes that entrepreneurs utilise business networks to gain access to capital and business training. Kadiri (2012) also suggests that networking facilitates business to gain access to resources that they do not possess.

Entrepreneurial Orientation

Entrepreneurial orientation research explains entrepreneurs' ways of taking initiatives as it explains the environmental impacts on thinking and behaviour, advocating that a significant modification in environmental factors have a matching change in cognition and behaviour. Mitchell et al. (2007) further asserts that the entrepreneur as the focus by explaining the structures of knowledge, assessment, judgment and evaluation of opportunities that leads to venture creation and economic growth. A study on innovation-based cluster entrepreneurship initiatives suggest that it is the cognition-environment nexus that is most important, not simply the manner in which entrepreneurs think (Chatterji et al, 2013).

Researchers such as Fatema (2017) suggest that entrepreneurial orientation is a pivotal element in understanding the creation of ventures from expansive theoretical work that stressed the necessity of the entrepreneurship process to a more focused research that examines how individuals think, learn, network and use their knowledge to sense information and start new ventures (Fatema, 2017). Chatterji et al, (2013) also demonstrate important links between individuals' cognitive facilities and their interests and abilities as entrepreneurs.

Public Private Partnerships (PPP)

Private public partnerships (PPP) emanate when two or more organisations in the public or private sector initiates a new cooperative relationship based on mutual trust, rather than being characterised by a hierarchical structure (Naoum, 2013; McQuaid, 2002). This relationship is preceded by a number of constructive connotations, such as a PPP being well thought-out as a tool that "creates synergies", that develops and strengthens competences, that generates alliances between various actors, and permits voluntary cooperation for financing and project management in many sectors. Mundial (2013) suggests that through its methodology, PPP has been able to overcome the social and technical complexities of rural development projects and natural resource dynamics. According to Food and Agricultural Organisation (2016), private public partnership for agribusiness development is defined as a formalised partnership between public institutions and private partners designed to address sustainable agricultural development objectives, where the public benefits anticipated from the partnership are clearly defined, investment contributions and risks are shared, and active roles exist for all partners at various stages throughout the PPP project life cycle.

Entrepreneurial Technology

Technologically-oriented entrepreneurs devote their resources to acquiring new and advanced technologies and developing new processes, products and services, although, the rate of technological changes within an industry might affect their technological adoption and/or development. Previous studies have found positive relationships between technology orientation and business performance (Mitton, Adair, McKenzie, Patten & Perry, 2017). The importance of technology orientation to innovation has been long recognised, but the relationship between technology orientation and business performance appears to have been given only minimal attention in the literature. An increasing number of studies have explored the impact of strategic orientations on innovation and business performance. Technology transfer involves dissemination of technology from places and in groups of its origination to wider distribution among more people and places (Tarpley, 2015). Similarly, Bozeman (2000) defines the technology transfer as the process of skill transfer, knowledge, technologies, methods of manufacturing, samples of manufacturing and facilities among governments, associations, research institutes and other institutions to ensure that scientific and technological developments are accessible to a wider range of users who can then further develop and exploit the technology into new products, processes, applications, materials or services. It is closely related to knowledge transfer.

Innovative Capacity

An innovation is the implementation of a new or significantly improved product (good or service), a new process, a new marketing method, or a new organisational method in business practices, workplace organisation, or external relations (Sonne, 2012). This definition echoes the evolution of the way innovation has been perceived and understood over the years. Economists and policy makers usually focused on R&D-based technological product innovation, basically produced in-house and in most cases manufacturing industries. This form of innovation was performed by a vastly educated labour force in R&D-intensive companies. The processes leading to such innovation were conceptualised as closed, internal, and localized. Technological advancements were essentially 'radical' and took place at the 'global knowledge frontier'. This characterisation implied the existence of leading and lagging countries, with low- or middle-income economies only catching up (Cristian, Jorge, Christian, & Marcos, 2017).

Innovation is the key to the economic development of any company, region of a country or country itself. Innovations are often nurtured in a seed bed comprising new combinations of ideas, technologies, assets and supply chains that often link businesses and industries, which had not previously established any bond. As technologies change, old products decrease in sales and old industries dwindle. Voeten (2012) posits that innovativeness and business competitiveness are manifested in product, process and the organisation. Reguia (2014) affirms that innovation plays a pivotal role in today's highly complex and competitive environment. Also, Hirsch, Peters and Shepherd (2013) define innovation as any new or highly improved change resulting from research and development, whether improving on existing insights or knowledge or improving the functionality, performance or other value to the user, and our exploitation of entrepreneurial opportunities. Innovation according to Reguia (2014) is the process of creating something new, which is central to the entrepreneurial process. Innovation involves creation of new ideas and putting them into practice, (Drucker, 2011; Subrahmanya, 2015). Firms create competitive advantage by perceiving or discovering new and better ways to compete and bringing them to market, which is, according to Porter (2000), the ultimate act of innovation. Drucker (2011) further suggests that innovation is a purposeful effort to create economic potentials and focused change on enterprise's social potentials. On the contrary, Subrahmanya (2015) argues that innovation is the act of converting new ideas into usable applications with positive economic or social consequences.

According to Johannessen, Oslen & Lumpki (2001), innovation refers to the result of economic application of new ideas that transform and enhance competitiveness. Perhaps the three most important types of technical innovation are; product innovations, process innovations and organisational innovations. Product innovations are changes in the physical characteristics or performances of existing products or services, or the creation of brand new products or services. Process innovations are changes in the way in which products or services are manufactured, created or distributed. Whereas organisational innovations generally affect the broader context of development, process innovations directly affect manufacturing. As a result of technology, entrepreneurship can foster a culture of innovation. To help increase the market share or margins, entrepreneurs invest in new ways of delivering and producing in a cost efficient manner. To do so, they rely on new technology, new process and new efficiency in supply chain. A cluster that fosters entrepreneurship is therefore, one in which individual is likely to experiment and come up with new ways of doing things so as to profit the organisation (Subrahmanya, 2015).

Theoretical Review

The study adopts the duo of institutional theory and resource advantage theory which provides the bases for utilising other resources such as material, financial and natural resources of the organisation. Mitchel (2000) submit that individuals are able to take what they remember from their observations, transform it into new behaviour and then decide if they want to put this new knowledge into actions. Meanwhile, Hoopes, Madsen & Walker (2003) describe the RBV of the firm as differences in performance that happen when the region or community possesses valuable and unique entrepreneurial tendencies that others do not have, it allows them to obtain a rent in its quasi-monopolist form. Resource based view, has basic assumptions on the cluster heterogeneity of service available from resources towards attaining a higher performance. While institutional theory stipulates the importance of networks and cultural values within the institutions. The duo theories identified the relationship which occurs when much of the resources used are principally the entrepreneur inherent skills to identify potential opportunities.

More so, the RBV of the firm gives researchers the opportunity to connect the resources available in the firm to its sustained competitive advantage. This theory identifies the existence of rivalry between firms that present differences in efficiency due to resources heterogeneity (Seung, 2016 ;Anthony, Thomas, Donald & David, 2012). Industry equilibrium is based on the productivity differentials between firms. The RBV of the firm considers that the differences in efficiency between firms within the same industry persist due to the difficulty in imitating the resources each firm possesses (Tadema & Adejana (2017), this means that systematic variations in profit and performance have their origins in particular firm's factors (Jose, 2015).

Empirical Review

Lawal, et. al (2018) studied the nexus between informal networks and risk-taking in Nigeria. The study examined the influence of risk-taking and informal networks on the performance of selected small and medium enterprises in Nigeria. Descriptive research design in which questionnaire was used to collect data from 381 SMEs owner-managers guided the study. Correlation, multiple regression and Structural Equation Modeling (SEM) were employed to test the hypotheses with Confirmatory Factor Analysis (CFA) for measurement model validation. Their results revealed that both risk-taking and informal networks have significant positive effect on SMEs performance. The study recommended that SMEs managers should strive to

embrace risk-taking as well as optimize the opportunities offered by informal networks potential towards expanding their contacts and enhance SMEs performance. The study added to entrepreneurial orientation dimension and informal institutional structure through the integration of risk-taking and informal networks with SMEs performance. An evolving dimension of entrepreneurial research revealed that entrepreneurial orientation and entrepreneurial networks were critical factors in fostering performance outcomes.

Gunawan, Jacob and Duysters (2013), in their study investigated the role of intra-cluster ties, extra-cluster ties, and entrepreneurial orientation in shaping firms' innovative performance. They conducted their analyses using a primary data set of 120 SMEs in the Cibaduyut Footwear-Manufacturing Cluster, Indonesia. They found that extra-cluster ties mediate the relationship between proactiveness and innovative performance. A combination of high extra-cluster ties and risk taking exert a positive impact on innovative performance. Surprisingly, further finding revealed that risk taking negatively moderated the influence of intra-cluster ties on innovative performance. Overall, the findings of the study pointed to the synergistic effects of entrepreneurial orientation and extra-cluster ties on innovative performance.

Methodology

The study adopted cross sectional survey to understand the essence and underlying structure of entrepreneurial initiatives through quantitative explorations. The main supposition of this form of inquiry is that the quantitative approach provides a more complete understanding of entrepreneurial initiative as it relates to innovative capacity. The adoption of survey method for this research is necessary to investigate and further recommend an effective framework for entrepreneurial initiatives with a view of enhancing agricultural cluster performance in North-Central, Nigeria; in line with the submission of Creswell (2014).

Population of the Study

The population of the study consists of members of the Association of Farmers of Nigeria (AFAN) that are registered and operating under the cluster schemes. The cluster schemes have different names across these States namely; Off Taker Demand Driven Strategy (ODDS), Association of Cluster Farmers and Cooperative Off taker Group Farming and in Kwara, Kogi and Niger States respectively. The population of the association as at 2019, according to Nigerian States Farmers totalled 3,100 drawn from the three states.

Table 3. Population of the study

STATE	NO OF COOPERATIVES	NUMBER OF MEMBERS
Kwara State	120	1200
Kogi State	90	900
Niger State	100	1000
Grand Total		3,100

Source: Nigerian States Farmer's Data Base (2019)

The sample size was determined using the Epiinfostatcalc software. Although the software is trademark by Center for Disease Control and Prevention, the software is in the public domain and freely available for use, copying translation and distribution. The software was adopted because of its level of precision, level of confidence or risk, degree of variability in the attributes being measured and external validity. The software is also associated with the decreased sampling error in a quantitative research as the larger the sample, the more likely the results are to represent the population (Amugune, 2014). Based on this, the sample of 342 respondents was selected at 95% confidence level.

Sampling Technique

The study adopted a multistage sampling techniques. The stages involved breaking down the sampling process into three stages. The first stage involved selection of States among the North Central Region of Nigeria which comprises of Benue, Plateau, Kogi, Niger, Nassarawa and Kwara States. The study adopted the use of fishbowl draw by writing the name of the States in slip of paper and put into a box and three states were randomly selected in line with the recommendation of Osuala (2007) which state that fifty percent of clustered environment is sufficient for a study. The selected states include Kogi, Niger and Kwara State. The second stage involved selection of the study clusters as each of the selected States has three clusters which were structured in line with the political zoning of the states. At this stage, one Cluster was randomly selected from each of the States; Edu Patigi belt in Kwara, Lokoja cluster in Kogi and Lavun Cluster in Niger State. Lastly, the research used representative sampling to select 342 across the strata in North Central Nigeria.

Data Collection Methods

The study adopts the primary method of data collection. Primary data has been the most common means in survey research by which researchers collect data. This method allows the investigation of the phenomena that cannot be directly observed by the researcher (Sekaran & Bougie, 2010).

Method of Data Analysis

In order to evaluate the spillover effect of entrepreneurial initiatives; networking, entrepreneurial orientation, public private partnership and entrepreneurial technological towards agribusiness, innovative capacity, the study employed partial least squares (PLS) approach to analyse the data collected. Barclay, Higgins and Thompson (1995) submit that the PLS is a structural equation modeling tool (SEM) that allows the study to simultaneously analyse numerous variables and predictor constructs and analyse unobservable theoretical variables. Also, PLS accommodates constructs with formative indicators, avoiding the various statistical issues associated with covariance structure analysis tools such as Linear Structural Relations (LISREL). Naik and Tsai (2000) posit that PLS is known for providing robust outcome even in the presence of multi-collinearity within blocks of manifest and between latent variables.

Result of Findings

This study administered 342 copies of questionnaire to the respondents and a total of 335 copies of usable questionnaire were retrieved and this gives 98% rate of response. The raw data collected were subjected to examinations which were in line with opinions of Cooper and Schindler (2007) who believed that assessment should be done to ascertain the completeness, accuracy, consistency and eligibility of the respondents. Based on that, this study was able to discover seven (7) copies of questionnaire that were not eligible to be considered due to incompleteness and outliers. Therefore, a response rate of 94% is considered adequate for the analysis in this study because Sekaran (2003) suggests that a response rate of 30% is sufficient for surveys.

Demographic Profile of the Respondents

The profile of the respondents was analysed using their demographic characteristics in terms of gender, years as member of cluster, age, educational

status and years as members of farmers' association.

Table 1 Demographic Profile

Items	Frequency	Percentage (%)
Sex		
Male	199	61.9
Female	122	38.1
Total	321	100%
Years as a Member of Cluster		
Below 5yrs	147	46.1
6-10yrs	166	51.7
11 – 15yrs	4	1.1
16 – 20yrs	4	1.1
Total	321	100%

Source: Authors' Field Survey (2019)

Table 1 revealed that out of the 321 valid responses used in this study, 199 (61.9%) were male while the remaining 122 (38.1%) were female. This is an indication that the number of females in agribusinesses is increasing in consistence with the world demographic changes in population based on gender. The number of respondents by gender is a reflection of the total number of male and female on agribusinesses in North Central, Nigeria. Also, of all the 321 respondents, 147 (46.2%) of respondents were below 5years as members, 166 (52.6%) respondents were between 6 – 10years, 4 (1.1) respondents are between 11 – 15years, and finally, only 4(1.1%) respondents is between 16 – 20years. This demographic index indicates that the concept of cluster is still at nascent stage in Nigeria.

Test of Hypotheses and Thematic Analysis of Focus Group Discussions

The study assessed the structural model and also applied the standard bootstrapping procedure with a number of 5000 bootstrap samples and 321 cases to assess significance of the path coefficients (Hair, Hult, Ringle & Sarstedt 2017).

Assessment of Measurement Model

An assessment of a measurement model involves determining individual item reliability, internal consistency reliability, content validity, convergent validity and discriminant validity (Hair et al., 2017). The result of the PLS-SEM reported according to the research objective:

Internal Consistency Reliability

Internal consistency reliability refers to the extent to which all items on a particular (sub) scale are measuring the same concept. Cronbach's alpha coefficient and composite reliability coefficient are the most commonly used estimators of the internal consistency reliability of an instrument in organisational research (Peterson & Kim, 2013). In this study, composite reliability coefficient was chosen to ascertain the internal consistency reliability of measures adapted. Two main reasons justified the use of composite reliability coefficient. Firstly, composite reliability coefficient provides a much less biased estimate of reliability than Cronbach's alpha coefficient because the latter assumes that all items contribute equally to its construct without considering the actual contribution of individual loadings. Table 1 showed the result of the composite reliability and average variance extracted.

Table 2 Summary of the Measurement Model (Composite Reliability and Average Variance Extracted)

Constructs	Items	Factor Loadings	Composite Reliability	AVE	Discriminant Validity
Networking Initiative	EN4	0.606	0.749	0.609	Yes
	EN9	0.922			
Entrepreneurial Orientation	EO1	0.616	0.811	0.593	Yes
	EO4	0.880			
	EO6	0.790			
Entrepreneurial Technology	ET2	0.797	0.816	0.599	Yes
	ET6	0.664			
	ET8	0.850			
Public Private Partnership	PP1	0.973	0.785	0.657	Yes
	PP4	0.607			
Innovative Capacity	INN10	0.681	0.800	0.575	Yes
	INN4	0.869			
	INN9	0.711			

Source: Authors' Field Survey (2019)

Secondly, Cronbach's alpha may over or under-estimate the scale reliability. The composite reliability takes into account that indicators have different loadings and can be interpreted in the same way as Cronbach's α (that is, no matter which

particular reliability coefficient is used, an internal consistency reliability value above .70 is regarded as satisfactory for an adequate model, whereas a value below .60 indicates a lack of reliability). Nevertheless, the interpretation of internal consistency reliability using composite reliability coefficient was based on the rule of thumb provided by Hair et al (2017), who suggest that the composite reliability coefficient should be at least .70 or more. As shown in Table 2, the composite reliability coefficient of each latent constructs ranged from .749 to .816, with each exceeding the minimum acceptable level of .70.

Discriminant Validity

In the study, discriminant validity was ascertained using AVE, as suggested by Fornell and Larcker (1981). This was achieved by comparing the correlations among the latent constructs with square roots of average variance extracted (Fornell & Larcker, 1981). In addition, discriminant validity was determined following Rigdon, (2012) criterion by comparing the indicator loadings with other reflective indicators in the cross loadings table. First, as a rule of thumb for evaluating discriminant validity, Fornell and Larcker (1981) suggested the use of AVE with a score of 0.50 or more. To achieve adequate discriminant validity, Fornell and Larcker (1981) further suggest that the square root of the AVE should be greater than the correlations among latent constructs.

As indicated in Table 3, the values of the AVE range between 0.540 and 0.724, suggesting acceptable values. In Table 3, the correlations among the variables of entrepreneurial initiatives and performance of agribusiness clusters were compared with the square root of the average variances extracted (values in bold face). Table 3 also shows that the square root of the average variances extracted were all greater than the correlations among latent constructs, suggesting adequate discriminant validity (Fornell & Larcker, 1981).

Table 3 Discriminant Validity (Fornell-Larcker Criterion)

Constructs	EN	EO	ET	PP	INN
Networking Initiative	0.778				
Entrepreneurial Orientation	0.036	0.774			
Entrepreneurial Technology	0.124	0.221	0.756		
Public Private Partnership	0.126	0.161	0.141	0.824	
Innovative capacity	0.175	0.069	0.106	0.409	0.758

Source: Author's Field Survey (2019)

The discriminant validity was ascertained by comparing the indicator loadings with cross-loadings (Hair, Hult, Ringle, & Sarstedt, 2017). To achieve adequate discriminant validity, Rigdon, (2012) suggested that all the indicator loadings should be higher than the cross-loadings. Table 4 compared the indicator loadings with other reflective indicators. All indicator loadings were greater than the crossloadings, suggesting adequate discriminant validity for further analysis.

Table 4 Cross Loading and Factor Loadings

Constructs	Items	EN	EO	ET	PP	INN
Networking Initiative	EN4	0.606	-0.060	0.322	0.511	0.472
	EN9	0.922	-0.448	0.612	0.468	-0.101
Entrepreneurial Orientation	EO1	-0.269	0.616	-0.242	-0.105	-0.198
	EO4	-0.362	0.880	-0.577	-0.193	-0.057
	EO6	-0.277	0.790	-0.492	-0.053	0.310
Entrepreneurial Technology	ET2	0.531	-0.646	0.797	0.310	0.200
	ET6	0.326	-0.236	0.664	0.192	0.405
	ET8	0.589	-0.488	0.850	0.413	0.983
Public Private Partnership	PP1	0.590	-0.170	0.390	0.973	0.568
	PP4	0.298	-0.032	0.243	0.607	0.120
Innovative Capacity	INN1	0.331	0.500	0.511	-0.054	0.901
	INN2	0.613	0.641	0.468	-0.451	0.911
	INN3	-0.258	-0.292	-0.105	0.649	0.716

Source: Author's Field Survey (2019)

Hypothesis: Entrepreneurial Initiative and Innovation

The objective examined the relationship between entrepreneurial initiative and innovation. The result of the hypothesis is as follows:

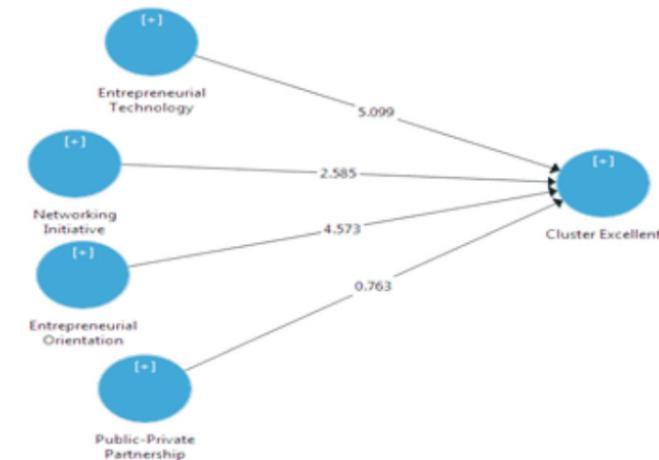


Figure Structural Model for Innovative capacity. Source: Author's Field Survey (2019)

Table 5 Structural Model Result for the Innovation

Constructs	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
Entrepreneurial Orientation -> Innovation	0.312	0.332	0.068	4.573	0.000
Entrepreneurial Technology -> Innovation	0.349	0.337	0.069	5.099	0.000
Networking Initiative -> Innovation	0.188	0.189	0.073	2.585	0.013
Public-Private Partnership -> Innovation	-0.050	-0.052	0.065	0.763	0.449

Source: Author's Field Survey (2019)

The objective was achieved through Hypothesis H0₁ which predicted that entrepreneurial initiative is positively related to innovation. Result indicated that networking initiative had significant relationship with innovation ($\beta = 0.188$, $t = 2.59$, $p < 0.013$), hence, the result support the Hypothesis. Furthermore, entrepreneurial orientation is positively related to innovation. As shown in Table 5, a significant positive relationship between entrepreneurial orientation and

innovation ($\beta = 0.312$, $t = 4.578$, $p < 0.000$). The result was found supportive, indicating support for Hypothesis. Similarly, entrepreneurial technology is positively related to innovation. Result (Table 5, Figure 1) indicated that entrepreneurial technology had significant relationship with innovation ($\beta = 0.349$, $t = 5.10$, $p < 0.000$), this found support with the Hypothesis. Regarding the influence of public private partnership on innovation, result indicated that of public private partnership had no significant relationship with innovation ($\beta = -0.050$, $t = 0.763$, $p < 0.449$). Hence, sub hypothesis H0 was not supported.

Although the structural equation model identified very minute relationship between private public partnership and innovation, other variables (networking, technology and entrepreneurial orientation) have strong relationships. The weak relationship on public private partnership can be explained by the fact that African countries are yet to fully adopt the initiatives in agricultural sector. More so, McQuaid (2002) observes that because of a necessary shift in policy focus and strategy, most recent PPPs in agribusiness sector have been centered on finance rather than research and development (R&D). These partnerships regularly involve government agencies aiming to carry out policy mandates, such as increasing agricultural efficiency and promoting a job-based economy, by helping to mitigate cluster firms' risks related to finances. Public sector partners help to reduce risks faced by cluster firms through various means, including financial contributions of up to 100 percent in certain cases, provision of scientific research services, provision of managerial expertise and acting as anchors. This is also supported by studies of Flower (2008); Elena et al (2015) which highlight the importance of education in regional and national innovativeness by involving in research through partnership.

Conclusion and Recommendations

It was concluded that entrepreneurship has strong positive relationship with innovation. The study found that adoption of technology and networking with relevant agencies ensures that business resources are efficiently utilised and guaranteed innovative capacity with the community. Also, the resources and knowledge capital of research institutes are often leveraged by the business world. Private organisations partner with government establishments on technological fabrications to ensure that innovation is achieved to optimum level. It therefore recommends that policy makers should as a matter of fact create an enabling environment for adoption of technology to thrive in North Central Nigeria. There should be high level of collaboration between the resident tertiary institutions, the

agribusinesses and the research institutes. The close collaboration between these bodies can help to draw a joint plan and pool efforts and resources together that are essential for an efficient delivery of various innovative activities and supports within the clusters.

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