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The effect of entrepreneurs in agriculture value chain optimization in Nigeria: An empirical study

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Abstract
This study examines the effect of Entrepreneurs in Agriculture Value Chain optimization in Nigeria. The importance of this study is rooted in the fact that Nigeria is a major producer of agricultural product, yet the country has not received very commensurate income from agriculture due to the fact that most of the products are exported over-sea in their raw form, a situation that has led to Nigeria depending on developed countries for the finished products of its original agriculture products such as chocolate, candies etc. A survey design is adopted for the study by designing and administering questionnaire to the target population of the study. ANOVA test is used in analyzing the data collected and it was discovered that there is no significant difference between the effects of different types of entrepreneurs in Nigeria agriculture value chain maximization. It is recommended that different entrepreneurs operating in agriculture value chain should be encouraged equally through the provision of investment incentives such as low interest loans, subsidies on agriculture equipment, favorable business environment etc.

Keywords: entrepreneur, value-chain, optimization, ICTs and agriculture

1. Introduction

Agriculture sector plays a significant role in the economies of most developing countries because the sector employs about 40% of the total labour force in developing countries. The sector contributes an annual per capital income ranging between $400 and $1,500 to the economies of developing countries [1]. Most developing countries may continue to rely on agriculture sector to meet the food need of its rapid growing population, to meet the raw materials need of their local industries as well as providing employment for a substantial number of its citizens.

In Nigeria for example, agriculture was the main stay of its economy before the discovery of crude oil. According to Verter and Becvarova [2], from 1960 – 1969 the Agricultural sector contributed on the average 51.0% of GDP and generated 64.5% of the export earning of the country. However, from 1970 to 2000, the sector's contribution to GDP and export earnings steadily declined because Nigeria's focus shifted to oil export. From 2009 to 2015, agriculture sector has contributed an average of 23.5% to GDP and generated only 5.1% of export earnings [3].

The Nigeria agriculture sector is highly concentrated on crop production which accounts for 90% of Nigeria total agriculture output [4]. Fishery, forestry and livestock account for the remaining 10%. Despite the sizeable portion agriculture sector command in the overall Nigeria economic activities, the sector's contribution to the government revenue is relatively small accounting for only 4.8% of the foreign earnings in 2017 [5].

The potentials of Nigeria's agriculture sector to contribute more to the country's GDP and foreign earnings coupled with the fact that the rapid globalization of agriculture markets has led to the generation of new production and distribution system which has compelled different administrations in Nigeria at both the national, state and local government area to focus more on agriculture as a means to diversify the economy especially in the face of dwindling oil prices.

Various policies to develop the agriculture sector has been formulated and implemented by different administrations in Nigeria. In 2012 the Agricultural Transformation Agenda was introduced by the former Nigeria President Goodluck Jonathan to improve farmer's income, increase food security, generate employment and transform the country to a leading player in the world food market [6]. The administration of President Muhammadu Buhari has launched the Agriculture Promotion Policy (APP) aimed at resolving food production shortages and improving output quality.

Despite these policy intervention in the sector, Nigeria's agriculture sector is still under developed because little emphasis was placed on value optimization along the agriculture value chain, rather emphasis was placed on production. For instance, a recent analysis By Martin [7], noted that in the production of a bar of chocolate, a marginal 3% of the value added is in the production while the remaining 97% is in the processing, marketing and retail segments of the value chain. One can infer that similar trend obtains across other agricultural product.

The cardinal objective of modern agriculture is to reduce the problem associated with agricultural loss and wastage to its barest minimum, improve on the current output under-utilization by ensuring an efficient optimization of all the linkages between the producer and final consumer through its value chain.

According to Bryden *et al*, [8] several existing studies on entrepreneurship in the agricultural sector has mainly focused on the ability of farmers to generate new opportunities,

organized either as new business ventures or as part of the existing business entity. There is an increasing need to expand production and optimize the value of the commodities in order to achieve self-sufficiency in food production, deepen diversification, and increase earnings to the economy as well as generating more employment for the massive unemployed. The above listed needs can only be achieved with the help of entrepreneurs who would be more concerned with why, when and how individuals identify and exploit business opportunity in the agricultural sector.

The need for entrepreneurship in optimizing agriculture value chain is imperative because entrepreneurs has been linked to amplified growth, increase aggressiveness of countries, increased creation of wealth and increased quality of life [9].

Osadolor [10], noted that during economic crisis, when development is negative, the need for entrepreneurship development becomes profound which can be used as an antidote for such economic problems. Anosike and Coughenour [11], found out that entrepreneurship is significantly related to farm size, human capital and regional variation in land and soil type. Barbieri and Mahoney [12], noted six goals of entrepreneur in agriculture to include; reduce uncertainty and risk, grow and service markets, enhanced financial condition, individual aspirations and pursuits, revenue enhancement and maintain family connections.

In discussing the effects of entrepreneur in agriculture value chain optimization there is the need to differentiate the different types of entrepreneur with a view to ascertaining which type of entrepreneur operating in the sector that is most important to the value chain. A recent work by ADB [13], noted that one of the central ideas of agriculture value chain concept is the differentiation of the total agro system and the specialization of each element so as to optimize the entire system. To this end, this analysis separated entrepreneur operating in the agriculture sector into; investment entrepreneur (investpreneur), merchant entrepreneur (Merchant Preneure) and information entrepreneur (informpreneure). The analysis therefore hypothesized that, there is a significant difference in the effect of investpreneure, merchantpreneure and informpreneure in Nigeria agriculture value chain optimization.

If our hypothesis holds, then more emphasis should be accorded to that particular entrepreneur within the sector. For example, it is believed that the processing of farm crops into finished goods is the area that should be accorded priority most. According to Izevbekhai and Ebiaku [14], entrepreneurs are differentiated into six types which includes;

1. Agriculture entrepreneur: (Agropreneur): These are individuals who go into fermentation, own vineyard enterprise, agriculture farm produce etc.
2. Investment entrepreneur (Investpreneur): These includes individuals who purchase capital goods such as plants and machinery in a factory in order to produce goods for future consumption, or individuals who purchase assets such as securities works of arts, banks and building society deposit.
3. Merchant entrepreneur (Merchantpreneur): This is an individual who buys goods for resale, acting as principal and usually holding stock.
4. Information entrepreneur (Informpreneur): This is an individual who gives facts about something or somebody. It is also an individual who gives knowledge, eg a consultant that owns a consultancy company.
5. Service entrepreneur (Servicepreneur): This is an individual who is able to use his skills to help or assist somebody e.g. a barber who owns a barbing saloon.
6. Co-entrepreneur (Co-preneur): This is essentially a situation where husband and wife both play active role in the management of their business venture.

The complexities of agriculture in developing countries have militated against its optimization right from the production of farming seeds to the final consumption. For example, a typical Nigerian farmer will produce the seeds he needs for his planting, grow and harvest the crops on his fields, process and market the processed produce and also form part of the final consumer himself. According to a PWC report [15], other complexities affecting agriculture value chain in developing countries includes; poor input supply, inadequate storage facilities, crude method of processing agriculture products, poor infrastructures i.e. roads, power etc. poor marketing strategies, non implementation of research and development (R&D), inadequate financing and poor regulatory framework. All the aforementioned factors militating against the Nigeria agriculture value chain optimization needs to be adequately tackled by entrepreneurs in order for Nigeria's agriculture value chain to be optimized.

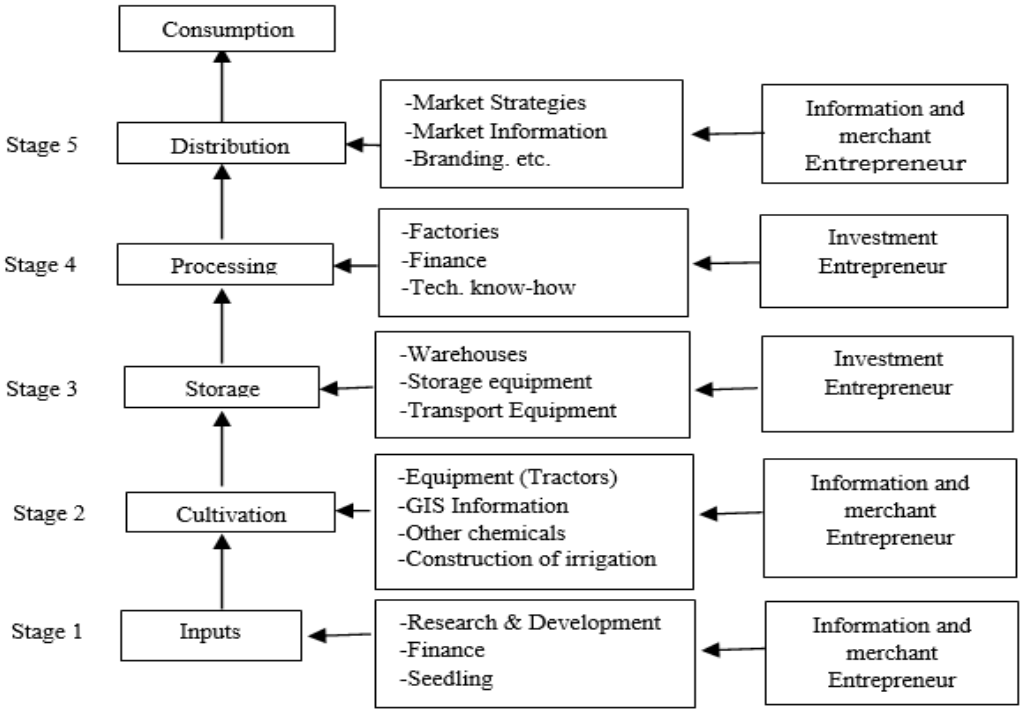
A value chain can be seen as a vehicle by which new forms of production, technologies, logistics, labour processing and organizational relations and networks are introduced [16]. The basic characteristics of a value chain is market focused collaboration; different business enterprise working together to produce and market agriculture products effectively and efficiently by allowing agricultural business to respond to the market place through linking production, processing and market activities to meet market demand.

The need for entrepreneurs in agriculture value chain is rooted in the fact that agricultural companies need to progressively adapt to the vagaries of the market, varying consumer lifestyle, enhanced ecological regulations, new necessities for product quality, chain management, security, sustainability etc. [9]. This is because traditionally agriculture is a low-tech industry with limited dynamics dominated by numerous small family firms. However, for agricultural crops value chain to be successfully optimized the following factors must be considered; enabling environment, credit and financial support, up-grade in infrastructure, adoption and adaptation of modern technology, introduction of new markets and enhancement of up-to-date market information and private sector participation.

ICTs have become an important tool in promoting agriculture value chain efficiency; this has lead to the rapid expansion in the use of mobile technologies in particular. ICT applications can support farmers directly through various general and specialized channels such as M-Pesa which can support access to mobile payment services for a large number of people without access to banking, thereby facilitating transaction in the value chain [17].

ICTs are also being used to strengthen the capacity of

extension officers and NGO's field staff to reach farmers with timely and accurate information and at the same time help capture data from the field. Further along the agriculture value chain, technologies offer considerable possibilities to enhance traceability, which is particularly relevant as certification grows in importance, this has made it possible for exporters to be able to trace consignments back to individual farmers and take necessary action to address problems that may arise [18]. Finally, ICTs are used to access up to date research and development in agriculture sector through various publications.



***Source*:** Authors compilation.

Fig 1: Entrepreneur activities in agric value chain optimization.

From fig. 1 above, one can observe that in all the stages of agriculture value chain the input of the entrepreneur is profound. In the stage of farming inputs, the Information and merchant entrepreneur provides the finance for purchasing seedling (inputs), in addition the entrepreneur engages in research and development of new seedlings, organizing extension services for the farmers. During cultivation stage again the Information and merchant entrepreneur provides equipment such as tractors, other chemicals etc. they also provide Agro-GIS information in determining the right time to plant the seedlings, they also help with finance to construct and channel irrigation for different crops. After cultivation the investment entrepreneur provide mobility for transporting the harvest to warehouse which they also provide. In addition they provide storage equipment like freezers, dryers etc. At this stage the farmers are settled for the season in preparation for the next season.

The harvest may be exported by adoption of various marketing strategies to obtain optimal pricing and profit. On the other hand the harvest may be passed on for processing where the investment entrepreneur again provides the needed factories, finance, technical knowledge, various machines etc.

After processing, the finished products needs to be stored in warehouses before being transported to the final consumer, at this stage the Information and merchant entrepreneur again provides all the needed storage facilities and subsequently help in the distribution to micro outlet, they also help in creating or searching for the market for various processed agriculture products. From the narrative above, it can be seen that the entrepreneur is the most important factor in the optimization of Nigeria agriculture value chain.

2. Materials and methods

This study on the effect of Entrepreneurs in Agriculture Value Chain optimization in Nigeria was carried out on small-hold farmers within Edo North district of Nigeria, from June 2017 to March 2018. A total of 388 respondents (both male and female farmers) were used in the study. The study employs both descriptive and inferential statistics. Specifically the study uses analysis of variance (ANOVA) in analyzing the collected data.

Study design

The study adopted the survey design by preparing and administering a structured questionnaire to respondents that were randomly selected from Edo North district of Nigeria. The questionnaires were closed-ended with three (3) point Likert scale. Relevant questions centred on the respondents perceptions on the effects of entrepreneurial in the optimization of agricultural value chain in Nigeria.

Study area

Edo North also known as Afemai district is a geographical enclave located in the northern part of Edo State in Nigeria. It is located north – east of Benin City, the State's Capital and it is the North Senatorial District of Edo State. Structurally, Edo North is made up of six Local Government Areas. The six Afemai Local governments and their administrative headquarters are: Akoko-Edo (Igarra); Etsako Central – Fugar, the Administrative Headquarters of the defunct Kukuruku Division until 1920; Etsako East – Agenegbode, a town located on the bank of the River Niger; Etsako West – Auchi, the Administrative Headquarters of all Afenmai from 1920 to 1963; Owan East – Afuze; and Owan West – Sabongida Ora. History has it that the six Local Government Areas which makes up Afemailand once existed as a single division which was first known as Kukuruku division. It was formally renamed Afemai Division in 1956 by the then Western Region House of Assembly. Most inhabitants of the area are farmers, hunters and fishermen [19].

Simple size

A total of four hundred (400) respondents were targeted in the study area hence a total of four hundred and fifty questionnaires were distributed.

Sample size calculation

The number of samples used in this study which is the sample size were estimated using the sample size formula by Krejcie and Morgan [20]. This approach is used when the population of the study is estimated. The number of completed and returned questionnaire is two hundred and eighty-eight (288) which is adequate for our analysis.

Subject and selection methods

A systematic random sampling procedure was adopted in the study, where the district is divided into units and respondents randomly selected from each unit. The systematic sampling method was adopted because; it gives the assurances that the population is evenly sampled, it also adds a degree of systematization into the random selection, and finally this sampling method is used because of the diversity among farmers within the district [21]. The population of the study is inclusive of those who engaged in farming activities on small-hold farms.

The analysis of variance (ANOVA) statistical techniques was utilized using SPSS version 22 statistical software to reveal respondents perception on the effect of different types of entrepreneurs on Nigeria agriculture value chain maximization. ANOVA is used in this work in line with similar study by Odama (1987) cited in Magaji *et al*, [22] which is stated as follows;

$U_i = U_0 + B_i + E$ ……(1)

U_o = the constant term of the model

B_i = column or supplementary variable effect

E_i = Random effect

To determine whether entrepreneurial activities have significant effect on the agricultural value chain optimization in Nigeria, the F – Statistics is calculated and compared with its critical value from the F-table at 5% level of significance at degrees of freedom of one. The F-statistics is computed using the following formula:

$$F = \frac{SSE/(K-1)}{SSR/(N-1)} \quad or \quad \frac{MSS\ of\ SSE}{MSS\ of\ SSR} \text{ ----------(2)}$$

Where: SSE = Sum of square due to regression (explanatory variable)

SSR = Sum of squares due to regression

The combination of SSE + SSR = SST

Where: SST = Sum of square total:

$$\sum Y_1^2 = \sum Y_2^2 + \sum U_2^2 = \beta_2^2 \sum Y^2 + \sum U_1^2 \text{ ……(3)}$$

and

$$F = \frac{\beta^2{}_2 \sum Y_1^2}{\vartheta^2} - \frac{\beta^2{}_2 \sum Y_1^2}{\vartheta^2} \text{ ----------(4)}$$

3. Results

The results of the data analyzed using Analysis of Variance (ANOVA) is presented below in tables1, 2, and 3 at F-statistics of 5% (0.05) level of significance.

Table 1: Descriptive statistics

	N	Mean	Std Deviation	Std error
Informpreneur	74	27.38	3.148	.366
Merchantpreneur	129	26.74	2.751	.242
Investpreneuer	85	27.07	2.959	.321
Total	288	27.00	2.921	.173

Table 2: Confidence interval of the analysis.

	95% confidence interval for mean			
	Lower bound	Upper bound	minimum	Maximum
Informpreneur	26.65	28.11	25	32
Merchantpreneur	26.26	27.22	25	32
Investpreneuer	26.43	27.71	25	32
Total	26.66	27.34	25	32

Table 3: ANOVA table

	Sum of Square	df	Mean Square	F	Sig
Between groups	19.979	2	9.990	1.173	.311
Within groups	2428.021	285	8.519		
Total	2448.000	287			

From table 1, the mean and standard deviation for the respondents with respect to farmers who are of the opinion that informpreneur had more effect on value chain maximization is 27.38 and 3.148 respectively, while the mean and standard deviation for the respondents who are of the opinion that Merchantpreneur had more effect on value chain maximization is 26.74 and 2.751respectivly. Finally, the mean and standard deviation for the respondents who are of the opinion that investpreneur had more effect on value chain maximization is 27.07 and 2.921 respectively. Form the different levels of entrepreneur considered for the study it is

discovered that the analysis exhibited a normal distribution in their respective means and standard deviation is not violated.

To test the underlying hypothesis of the study the $F_{cal} = 1.173$ was compared to the $F_{tb} = 3.81$, this indicates that there is no significant information to reject the null hypothesis which states that there is no significant difference between the different types of entrepreneur in the optimization Nigeria agriculture value chain. This means that the contribution of the different types of entrepreneurs is similar or the same which is evident from our table 2 where at 95% confidence interval for the mean, the lower band exhibited the same distribution. The $p = 0.311$ which is non-significant given $p < 0.05$ further shows that there is no significant difference between the different types of entrepreneur in optimizing agriculture value chain in Nigeria.

4. Discussion

The major finding of this work shows that there is no significant difference between in the effects of different types of entrepreneur on agriculture value chain optimization in Nigeria. The finding is in support of the null hypothesis and this is attributed to the fact that most entrepreneurs operating in Nigeria agriculture sector over-lap in the performance of their objectives. This is in line with similar findings by Barbieri and Mahaney [12], who noted that entrepreneur perform nearly the same goals in agriculture sector value chain.

The practical implication of this finding is that the different types of entrepreneur operating in the agriculture sector in Nigeria should be given equal incentives and encouragement in their quest to optimize the agriculture value chain. The study has clearly shown that entrepreneur in the area of processing the farm products into finished goods are fewer than those in charge of buying and selling. Until this trend is revised, the activities of merchant entrepreneur may continue to distort agriculture value chain because most farmers prefer to sell their products to the highest bidders over-sea who have a better comparative advantage in fermentation and processing which represent the cardinal part of the value chain.

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