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**REVITALIZATION OF NIGERIA'S ECONOMY THROUGH e-AGRIPRENEURSHIP:  
HARNESSING THE POTENTIALS OF INFORMATION AND COMMUNICATION  
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**Abstract**

*Nigeria's agricultural sector, prior to oil boom, was the mainstay of the economy. However, with the discovery of oil, the actual growth of the sector is not meeting the potential. The quickest and reliable way of revitalizing the agriculture sector by making it more attractive and profitable venture is by harnessing the potentials of Information and Communication Technologies (ICTs) through adoption and implementation of e-agriculture systems. The ICT is capable of transforming the traditional agriculture into agriprenurship that have the potential to contribute to a range of social and economic development such as employment and income generation, poverty reduction and improvements in overall food security. This paper mainly focused on areas, challenges and benefits of applying the inventions of ICT as enablers in revitalizing the Agriculture sector. Since 'e' concept when applied in the field of agriculture or agriprenurship yields positive results capable of transforming it into a dynamic world class, there is need for collaborative efforts between the agriculture and ICT sectors.*

**Key words:** ICT, e-agriculture, agriprenurship, economy

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**Introduction**

**Agriculture:** Primarily, Agriculture is the growing of crops and rearing of animals for man's use. It includes crops production, livestock production and poultry production. Other areas are aquaculture, apiculture, forestry, wildlife production, ornamentals production, etc. Nigeria's economy was and is, basically, agrarian in nature. Nigeria's agricultural sector, prior to the oil boom, used to provide more than 70% employment of the country's labour force and, according to Oji-Okoro (2011), well over 75% of the foreign exchange. These were in addition to the sector being important sources of food for the citizens, raw materials for agro-processing industries and market for agro-allied industries producing farm inputs.

However, with the discovery of oil the sector was, as a matter of policy, relegated to the back seat to rest only in the hands of resource-poor small-scale producers surrounded by vicious cycle of poverty. Ukeji (2003) wrote that in the

1960's, agriculture was contributing as high as 64% to the total GDP of the economy but continuously that decreased to 48% in the 1970's, to 20% in 1980 and 19% in 1985 as a result of oil discoveries in large quantity coupled with deprioritization of the sector pronounced in these periods. Currently, agriculture contributes only 24.4% to GDP and provides employment to 37% of country's work force (NBS, 2017). Based on this, National Planning Commission (2009) observed that growth in the sector has not met the required needs and expectations. This is because a wide gap exists between the potentials or maximum attainable capacity and the actual. Indeed, more often than not, agricultural activities are usually concentrated in the less-developed rural areas where there is a critical need for rural transformation, redistribution, poverty alleviation and socio-economic development (Stewart, 2000).

As at 2016, Nigeria ranks first among countries of the world in the production of cowpea,

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cassava, yams, and Shea nuts; second in sorghum, ginger, sweet potato, okra and cashew nuts. It also ranked fourth in production of both goats and cocoa while fifth in millet (IITA, 2017). Thus, in a study on the impact of the sector on the Nigeria's economy from 1986-2007, by Oji-Okoro (2011), positive relationship between GDP on one hand and government expenditure on agriculture, domestic savings, and foreign direct investment on the other hand was revealed; with 81% of variation in GDP attributable to the explanatory variables. More recently, Ekperiware and Olomu (2015) established strong empirical correlation between Nigerian's total GDP and the agriculture, and this confirms that the prospects of the non-oil sub-sector and the overall economy are closely tied to the performance of the agricultural sector.

#### **Potentials of the Agricultural Sector**

Currently, with an estimated 195 million people, representing 2.6% of the total world's population, Nigeria occupies 0.61% of the total global land mass. As much as 82 million hectares of land were found to be arable with only 42% of it being cultivated. In addition, most of the 20 million hectares covered by forests and woodlands are believed to have some agricultural potentials. Further, all the major agro-climatic zones of the country, ranging from the swampy areas of the extreme south to the sahel zone of the far north support or favour the cultivation and or rearing of one type of agricultural activity or the other. Furthermore, in Nigeria, there are all the 6 classes of agricultural soil types in the world; while both the intensity and the duration of rainfall, sunshine hours and day length are ideally suited for round the year cultivation of crops and growing of animals.

In the livestock sub-sector, according to Ogbah (2016), Nigeria has an estimated 19.5 million cattle, 72.5 million goats and 41.3 million sheep. These values represented 0.15, 7.25 and 4.13 percent of the world's respective animals' population. All these are in addition to the 157.8 million of poultry being kept in various corners of the country. Thus, suffice to mention that the potentials of Nigeria's agricultural sector in terms of revitalizing the nation's economy as

contained in the Economic Recovery and Growth Plan (ERGP) policy document of the Federal Government cannot be over emphasized.

#### **The Problems**

The deprioritization of agriculture and over-dependence of the economy on oil, have resulted into the following attendant problems / antecedents:

- i. Widened food demand-supply gap
- ii. Escalated import value of food items
- iii. Increased food insecurity
- iv. Increased rate of youth unemployment
- v. Depreciated value of Naira vis-a-vis other currencies
- vi. Escalated import value of raw materials for agro-processing industries
- vii. Declined contribution of agro-allied industries
- viii. Declined proportion of agricultural GDP

#### **Remedies**

To ameliorate the above-mentioned problems and thus for the agricultural sector to regain its lost glory in the national development and competitiveness in the global economy, there is a need for injection of new ideas and creative processes for value creation in a sustainable manner. Hence, the need for entreprenuring the agriculture and *eing* the products of the process. Put simply, there is a need for concerted efforts in harnessing the potentials of information and communication technologies through adoption and implementation of e-Agripreneurship packages in the Nigeria's economy.

#### **The Concept 'e-agripreneurship'**

##### **Agripreneurship**

Agripreneurship is derived from the general terms of 'Agriculture' and 'Entrepreneurship'. Primarily, Agriculture is the science of growing crops and rearing animals for man's use. Entrepreneurship, itself, is a process which involves vision, innovation, change and creation. It also involves use of passion in creation and implementation of new ideas and creative solutions. According to Kuratko and Hodgetts (2004), essential requirements of entrepreneurship include willingness to take

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calculated risk, the ability to formulate an effective venture team; the creative skills to mobilize working resources, basic skills to build workable business plan and finally the vision to recognize opportunity where others see chaos, contradiction and confusion. Similarly, entrepreneurship is seen as a process that leads to creative solutions to social problems or the formation of new and innovative enterprises (University of Illinois Academy of Entrepreneurial Leadership, 2013). Entrepreneurship is about finding means and ways of creating and developing a profitable business.

The term 'Agripreneurship', on the other hand, is frequently used in the context of small business formation in agriculture. Dollinger (2003) defines agripreneurship as the creation of innovative economic organization for the purpose of growth or gain under conditions of risk and uncertainty in agriculture. In a nutshell agripreneurship, as a concept specific to agriculture and drawn from wider entrepreneurship, refers to the application / practice of entrepreneurship in any of the fields of agriculture. It is a profitable marriage between agriculture and entrepreneurship, thus transforming farms into agribusinesses.

The vast potentials of Nigeria's agricultural sector call for the development of Agripreneurship.

Agripreneurship is necessary for the socio-economic improvement of people through evolution of new agrienterprises, agricultural commodity value chains and overall economic growth. In the face of increasing unemployment and poverty in rural communities and slow growth of agriculture, there is need for Agripreneurship for increased productivity and profitability of agriculture. According to Bairwaet *al.*, 2014, Agripreneurship ventures are needed in developing entrepreneurs and management workforce to cater agricultural industry across the world. Similarly, Bairwa and Kushwaha (2012), opined that agripreneurship plays various roles in the growth and development of national economy through increasing the income level and employment opportunities in rural and urban areas. Finally, to

Sah (2009), agripreneurship helps economic systems by inducing productivity gains of smallholder farmers and integrating them into local, national and international markets; reducing food costs, supply uncertainties and improving the diets of the rural and urban poor; and generating growth, increasing and diversifying income, and providing entrepreneurial opportunities in both rural and urban areas.

### **e-Agripreneurship**

The concept of "e-" as a prefix refers to electronic version or electronic means through which something is carried out or contained. Thus, there are 'e-mail', 'e-government', 'e-marketing', 'e-learning' etc. This mean carrying out these processes through electronic means. Consequently, 'e-Agripreneurship' means a way of carrying out agripreneurship activities through the electronic means such as radio, television, phone set, laptop, desktop etc. Today more and more entrepreneur's world over are adopting the concept of e-Agriculture as an emerging field focusing on the enhancement of agricultural and rural development through improved information and communication processes. This concept is cross-cutting and entails the conceptualization, design, development, evaluation and application of innovative ways to use information and communication technologies in the rural domain, with a primary focus on agriculture. E-Agriculture or e-agripreneurship as an emerging field in the intersection of agricultural information, development and entrepreneurship, refers to agricultural services, technology dissemination, and information delivered or enhanced through the internet and related technologies (FAO 2005).

### **Implementation of e-Agripreneurship Areas**

In Nigeria today, changing mindset of the highly influential and qualified persons capable of employing themselves in agriculture, increased access to emerging technologies and emergence of more lending institutions coupled with increased competence on agriculture and allied

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sectors have tremendously contributed in enhancing the potentiality for e-Agripreneurship. Pandy (2013) enumerated areas of agricultural entrepreneurship activities as dairying, sericulture, goat rearing, rabbit rearing, floriculture, fisheries, shrimp farming, sheep rearing, vegetable cultivation, nursery farming, farm forestry, etc. The benefits of the emerging ICT inventions can be harnessed and incorporated into all these areas of agripreneurship. Other possible areas of agripreneurship capable of enjoying the services of ICTs are:

- i. Agro Produce manufacturing units – These units produce entirely new products using the agricultural produce as main raw materials. E.g.-Sugar factories, ground nuts oil extraction units etc.
- ii. Agro produce processing units – These units do not produce any new product. They merely process the agricultural products e.g. Rice mills, decorticating mills etc.
- iii. Agro-inputs manufacturing units – These units are the agro-allied industries which produce raw materials and other production inputs used in agriculture. E.g.Fertilizer production units, agricultural implements production units, feed mills etc.
- iv. Agro service centres –These include the workshops and service centres for repairing and servicing the agricultural implement used in agriculture.
- v. Agricultural marketing firms – These units are concerned with moving agricultural products from the point of production to the point of consumption via marketing intermediaries. They add to the farm products, utilities of place, time and form.
- vi. Miscellaneous areas – besides theabove-mentioned areas, the following areas may prove to be encouraging to establish agri-enterprises such as setting up of apiaries, seed processing units, mushroom production units, commercial compost units, farmers club, organic vegetable and fruits retail outlet, bamboo plantation and jatropha cultivation associations.

### Challenges

The process of incorporating the benefits of ICT inventions in Nigeria's agriculture is liable to encounter a number of challenges among which are:

- i. Conservatism on the part of the farmers which may lead to rejection or non-adoption of the emerging technologies
- ii. Technical know-how – Almost all ICT inventions to be operated, require one to be literate and technically oriented. On the other hand, most farmers for whom the technologies would be introduced live in rural communities where education tends to be very low.
- iii. Inadequacy of infrastructure such as internet facilities, electricity etc. in rural communities where the application of the emerging technologies would be carried out.
- iv. Financial constraints to purchase the ICT equipment on the part of the farmers who are the intended or target consumers of the technologies.
- v. Internet based activities are, globally, prone to hawking and other forms of dupe. The e-agripreneurship packages cannot be the only exception.

### Benefits

Applying the thought and practice of ICTs in the field of agriculture or agripreneurship generates, among other things, the following wide range of economic benefits:

- i. Increased productivity
- ii. Creation of new agribusiness ventures, hence new jobs
- iii. Evolvement of innovative products and services
- iv. Development of rural areas
- v. Increased wealth and welfare
- vi. Creating awareness of scientific agriculture and effective farm and agribusiness management systems
- vii. Helping in, strategically, coping up with delaying monsoons, drought, crop debts, fake seeds and shortages of production inputs such as fertilizers

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Similarly, Sah (2009) stated that the ‘e’ of agripreneurship is capable of:

- a) Reducing the burden and drudgery of agriculture
- b) Generating employment opportunities for both rural and urban youths
- c) Controlling migration from rural to urban areas
- d) Increasing national income
- e) Supporting industrial development in rural areas
- f) Reducing the pressure on urban cities
- g) lessening the information inadequacy in the agriculture sector and thus providing farmers with up-to-date knowledge and advisory services which they often required

### Conclusion

In a nutshell, the technical and innovative skills of “e-” concept applied in the field of agriculture or agripreneurship can yield positive results and well-trained agripreneurs capable of not only restoring the lost glory of the sector, but also transforming it into a modern, globally competitive and world class type. Thus, the need for collaborative efforts among stakeholders in the agriculture and ICT sectors to tap the advantage of the latter as enabler in catalyzing the development of the former.

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### Case Study for Implementation of e-Agripreneurship

Case: Implementation of e-Agriculture packages in Bangladesh

By

Sheikh Mohammed Mamur Rashid *et al.* (2016)  
**Summary:** The research investigated the impact of e-Agriculture on empowerment of farmers in Bangladesh. Data were collected in 2 different communities in two phases from the same group of respondents (first in August, 2013 and later in September, 2015). The data were subjected to “sample t test” and “multiple regression” analyses. The results showed that introduction of e-Agriculture impacted significantly on (i) economic(ii) family and social(iii) political(iv) knowledge (v) psychological empowerments of farmers with almost 84 % of the total variation of the empowerment.

**Table 1: Impact of e-agriculture on Farmers Economic Empowerment: Before and After Comparison of Study Groups**

Components of economic empowerment	Mean score		t test value
	Before e-Agriculture	After e-Agriculture	
Income due to yield	2.47	3.43	15.949**
Amount of savings	2.14	3.41	7.030**
Amount of investments	1.89	3.16	4.460**
Availing agriculture loans	1.95	3.41	3.333**
Purchase of farming inputs	1.35	2.60	0.864 <sup>NS</sup>

\*\* = t-value significant at 1% level;

<sup>NS</sup> = t-value not significant

Source: Sheikh Mohammed Mamur Rashid *et al.*, 2016

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**Table 2: Impact of e-agriculture on Farmers Social Empowerment: Before and After Comparison of Study Groups**

Components of family and social empowerment	Mean score		t test value
	Before introduction of e-Agriculture	After introduction of e-Agriculture	
Developing institutional contact	2.18	3.15	13.005**
Linkage with developing departments	2.51	3.39	13.658**
Team spirit	1.88	2.99	6.398**
Leadership quality	1.96	3.18	6.291**
Group consensus to solve problems	1.59	2.90	2.150 <sup>NS</sup>

\*\* = t-value significant at 1% level;

<sup>NS</sup> = t-value not significant

 Source: Sheikh Mohammed Mamur Rashid *et al.*, 2016

**Table 3: Impact of e-agriculture on Farmers Political Empowerment: Before and After Comparison of Study Groups**

Components of Political empowerment	Mean score		t test value
	Before introduction of e-Agriculture	After introduction of e-Agriculture	
Participation in social well-being activities	2.15	3.10	14.661**
Membership of social organizations	2.24	3.24	5.813**
Freedom of expression	1.80	2.99	5.415**
Conflict management	1.90	3.93	6.574**

\*\* = t-value significant at 1% level;

 Source: Sheikh Mohammed Mamur Rashid *et al.*, 2016

**Table 4: Impact of e-agriculture on Farmers Knowledge Empowerment: Before and After Comparison of Study Groups**

Components of Knowledge empowerment	Mean score		t test value
	Before introduction of e-Agriculture	After introduction of e-Agriculture	
Use of machineries and equipment	2.32	3.26	12.109**
Knowledge on value addition	1.47	2.67	2.813**
Adoption of IPM practices	1.99	3.29	5.614**
Adoption of INM practices	1.01	2.20	1.620 <sup>NS</sup>
Adoption of IWM practices	1.12	2.35	0.896 <sup>NS</sup>

\*\* = t-value significant at 1% level;

<sup>NS</sup> = t-value not significant

 Source: Sheikh Mohammed Mamur Rashid *et al.*, 2016

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**Table 5: Impact of e-agriculture on Farmers Psychological Empowerment: Before and After Comparison of Study Groups**

Components of psychological empowerment	Mean scores		t test value
	Before introduction of e-Agriculture	After introduction of e-Agriculture	
Motivation in farming	2.15	3.10	12.894**
Self esteem	2.24	3.24	10.864**
Risk taking ability	1.80	2.99	5.575**
Confidence	1.90	3.93	6.574**
Decision making ability	1.87	2.99	5.816**

\*\* = t-value significant at 1% level;

 Source: Sheikh Mohammed Mamur Rashid *et al.*, 2016

**Table 6: Impact of e-agriculture on the Farmers Empowerment: Comparison between Study and Control Groups**

Parameter of empowerment	Empowerment indicator	Mean Score		t-test value
		Study group	Control group	
Economic empowerment	Increased income due to increase in yield	0.955	0.674	3.728**
	Increased savings	1.271	0.891	6.080**
	Increased investments	1.271	0.717	5.295**
	Availing agriculture loans	1.459	0.891	4.347**
	Purchase of farming inputs	1.248	1.217	3.162**
Family and social empowerment	Developing institutional contact	0.977	0.717	2.789**
	Linkage with developing departments	0.895	0.652	1.848
	Team spirit	1.105	0.761	6.514**
	Leadership quality	1.218	0.869	3.919**
	Group consensus to solve problems	1.293	0.783	5.449**
Political empowerment	Participation in social well-being activities	0.744	0.608	2.874**
	Membership of social organizations	0.406	0.456	0.724
	Freedom of expression	1.188	0.761	4.023**
	Conflict management	1.218	0.826	2.874**
Knowledge empowerment	Use of machineries and equipment	0.939	0.522	4.933**
	Knowledge on value addition	1.195	0.783	4.739**
	Adoption of IPM practices	1.316	0.848	4.392**



Parameter empowerment	of	Empowerment indicator	Mean Score		t-test value
			Study group	Control group	
		Adoption of INM practices	1.188	1.217	2.031
		Adoption of IWM practices	1.226	0.957	3.511**
Psychological empowerment		Motivation in farming	0.939	0.587	3.697**
		Self esteem	1.015	0.739	4.057**
		Risk taking ability	1.181	0.935	3.500**
		Confidence	1.218	0.869	3.748**
		Decision making ability	1.105	1.131	0.553

\*\* = t-value significant at 1% level;

NS = t-value not significant

 Source: Sheikh Mohammed Mamur Rashid *et al.*, 2016

**Table 7: Impact of e-agriculture on Farmers Empowerment Using Multiple Regression Analysis**

Variables entered	Standardized partial 'b'	Value of 't' (with probability level)	Variation (%)
Usages of e-Agriculture (X <sub>1</sub> )	0.450	6.319 (000)	83.4
Attitude towards e-Agriculture (X <sub>2</sub> )	0.250	4.280 (000)	3.3
Organizational participation (X <sub>3</sub> )	0.137	2.856 (005)	0.9
Cosmopolitaness (X <sub>4</sub> )	0.180	2.615 (0.010)	0.4
Farm size (X <sub>5</sub> )	0.066	2.172 (0.032)	0.4

F-ratio = 201.782

 R<sup>2</sup> = 88.4

 Source: Sheikh Mohammed Mamur Rashid *et al.*, 2016