



Impact of ICT on Agricultural Challenges in Nigeria

Ofunama Preye¹, Wari Denyefa Cletus², E. E. Omovwohwovie³

¹Department of Fisheries, School of Agricultural Technology, Federal Polytechnic Ekowe, Nigeria

²School of Applied Sciences, Department of Computer Science, Federal Polytechnic Ekowe, Nigeria

Abstract Agriculture in Nigeria has had a type of history since Nigeria started exportation of crude oil and mass importation of food crops. Before Nigerian civil war of 1967-1970, agriculture was the mainstay of Nigerian Economy. Nigeria was then leading the world in some farm products such as cocoa and palm oil. Contribution of agriculture to Gross Domestic Product (GDP) was quite substantial. But today contribution of agriculture to GDP has declined substantially from 60% in 1960 to 25% in 1979. This trend has not changed much in recent time. In 2009, agriculture accounted for 33.4% of GDP, while 70% of the population lives below the poverty line. At this point in time there is no-gainsaying the fact that Nigerian agriculture and food security has great challenges. The obvious challenges arise from long period of neglect and relegation of agriculture to the back ground, among others. This paper therefore, proffers ICT solution to agricultural problems in Nigeria.

Keywords Agriculture; Skill Acquisition; Economy; Food Security; ICT

1. Introduction

Despite the growing importance of oil in Nigeria, the country has kept her foot and tracks as an agrarian economy alongside agriculture being recorded for its major share in Gross Domestic Production (GDP), as well as total exports which employ's the bulk of labour [7].

Almost 60%-70% of the Nigerian populations are involved in farming, but there is great trace of hunger and treat to poverty. Nigerians living on less than N 100 or US \$ 0.7 per day are about 70%. Food security is a key target area to attain as a fundamental agricultural objective in Nigeria. Focus on households having access to ensured acceptable nutritious food for healthy living [5].

According to Nigeria Agriculture and Food Security Challenges 2001, food domesticated is on the increase, but there is not enough to meet national food demand. With this there is lack of adequate and nutritious food to low income earners and poverty as these foods are expensive most of the time [5].

Oil is the main stay of Nigerian economy; if it is removed there may be a total collapse. As a result the economy should be diversified through agriculture and industrial establishment. The nation's economy is dependent on oil mostly (mono economy) and this will not lead us anywhere good.

ICT skill acquisition has been observed to be the quickest route out of economic stagnation [4] China, Japan and South Korea represent the simple modern examples of countries, that where regarded as very backward and under developed, but they have changed this view by investing in ICTs [5].

Nigeria can change by adapting to the trend in technology not to remain afloat in this competitive world. As stated above, Nigeria is to invest adequately in ICTs that is prevalent in advanced countries.

2. Objectives of Agricultural Policy and Food Situation in Nigeria

In a wide sense, the objectives of the new agricultural policy include:

- To achieve self-sufficiency in basic food supply and the attainment of food Security.



- To increase production and processing of export crops, using improved production and processing technologies.
- To increase agricultural raw materials for industries.
- To generate gainful employment in agriculture
- To obtain rational utilization of agricultural resources, improved protection of agricultural resources from drought, desert encroachment, soil erosion and food and the general preservation of the environment for the sustainability of agricultural production.
- To promote increase application of modern technology to agricultural production.
- To improve the quality of life of rural dwellers.

These objectives are achievable but the big question is how far they have been achieved. The nation's food balance sheet and the level of dependency on food import. See table 1.1 and figure 1.1. Here is the answer to the question.

Figure 1.1 represents the various quarters from 2013 to 2016 which indicates a gradual dip in the GDP. We can change the poor performance of agriculture yesterday for the better tomorrow.

Review of Efforts made by Nigerian Government to Boost Agriculture Nigeria government has made various efforts to boost agricultural products since 1960. These efforts include:

1. The 1962-1968 development plan laid emphasis on the introduction of more modern agricultural methods through farm settlements, cooperative plantations, supply of improved farm implements and a greatly expanded agricultural extension service.
2. Establishment of National Accelerated Food Production Programme NAFPP in 1972.
3. River Basin and Rural Development Authorities was established in 1976.
4. Operation feed the Nation (OFN) was introduced during General Obasanjo's regime.
5. Green Revolution Programme was inaugurated in 1980.
6. The World Bank funded Agricultural Development projects.
7. Rural Integrated Agricultural Development Programme (ADP)
8. Agricultural Extension and Research institutes, etc.

Each of the above programmes sought to improve food and cash crop production in Nigeria, but the tables and the bar chart shown above show that all these efforts have not much impact on agricultural production in Nigeria. This has led to mass food importation as local production has failed to meet the demand of Nigerians. Food production must grow consistently above demand to bridge short falls.

3. Challenges of Agriculture in Nigeria

The following are problems of agriculture in West Africa which incidentally is the same with that of Nigeria. The problems includes [1]:

1. Small farm size: This arises from the land tenure system. In many areas, farms are very small as a result of fragmentation of land. This does not encourage large scale farming.
2. Climatic problems: Adverse climatic condition such as insufficient rainfall, drought etc. affect agriculture in Nigeria.
3. Pest attacks: Attack by diseases and pests contribute to low productivity.
4. Illiteracy and conservation attitude of farmers: This is a major factor hindering agricultural production in Nigeria.
5. Inadequate capital: Some farmers are poor and many of them cannot afford the required capital for large scale farming and new techniques for agriculture.
6. Poor marketing facilities: Facilities for the marketing and distribution of crops are inadequate.
7. Inadequate storage facilities: Storage facilities for many agricultural products are inadequate.
8. Poor transport facilities: Transport facilities for evacuation of crops are inadequate.
9. Use of crude implement for farming.

These traditional problems facing agriculture in Nigeria can be solved; if changes are made from the solutions applied to these problems in the past have not yielded much result. It is a must that we look for a new way out of



our Agricultural problems. So, integration of Information and Communication Technology (ICT) to our Agricultural practice is the answer to our problems of Agriculture.

4. ICT Integration in Nigeria

Over the years, deliberate, though ineffective efforts have been made by donors and African countries to bring about agricultural development without much to show for it. Much of the failure is attributed to non-integration of agricultural information with other development programmes to address the numerous related problems that face farmers. Information is an essential ingredient in agricultural development programmes, but Nigerian farmers seldom feel the impact of agricultural innovations either because they have no access to such vital information or it is poorly disseminate [6].

The integration of Information and Communication Technology (ICT) in agriculture can be utilized for providing accurate, timely, relevant information and services to the farmers, thereby facilitating environment for more remunerative agriculture.

With ICT facilities, farmers can be updated on temperature, humidity and rainfall with additional parameters such as atmospheric pressure, solar radiation, wind speed and soil moisture. In India, Ingen technologies provide this information to farmers. Ingen Technologies also use predictions and analytical software to predict demand for beverages of a major software drink company.

The use of ICT portal or agricultural website helps in dissemination of vital agriculture information such as online detailed contents, crops, crop management techniques, fertilizers and pesticides, and many other agriculture related materials.

Most of the small scale farmers sell their products to middlemen who now determine the prices to the detriment of the farmers. But with the provision of commodity prices and market information on real time basis available on the internet, the farming community can be provided with choices they lack today. This will ensure better price realization and stimulate a drive towards better productivity. Again with e-commerce farmers can sell their products online. In this regard the farmer can sell his product right inside his farm. What the farmer needs do is to register his location and products, to ensure that products ordered online can be traced to a particular farmer [9]. This can widened the market for farmers.

With ICT, one can get information on market potential of some agricultural products. For instance, instead of selling unprocessed groundnuts you could further add value to it by further processing the nuts into peanut, butter and cooking oil. Prompt ICT information on weather, pests and diseases can prevent calamity experienced in agriculture in recent times, due to vagaries of weather and attack of pest and diseases.

Still in India, “aQUA technology” is applied to assist farmers. “aQUA” technology stands for “almost all Questions Answered”. It is a farmer –expert question and answer data base supporting Indian languages. It is an online multilingual multimedia informatics lab that answers farmer’s queries, based on location, season, crop and other information provided by farmers [3].

ICT offers more avenues for sharing of knowledge with stakeholders of different types and with different situations. Apart from canning and other methods of food preservation, various communities have their local ways of preserving agricultural products. This type of information can be shared among farmers. Information sharing is achieved through computer network which helps in dissemination of research products and messages. With Global Positioning System (GPS), one can describe the exact latitude and longitude of one’s farm. This is a way of promoting what is known as precise farming (Hutchinson and Sawyer, 2000). GPS can be used to control costs and boost crop yield. With GPS, farmers can map and analyze their fields for characteristics such as acidity and soil type.

Inadequate capital is one of the problems of agriculture in Nigeria. Some of the farmers especially small scale farmers are unaware of existing loan facilities due to poverty and low level of literacy. ICT can assist farmers by providing vital information on existing loan facilities

Through information provided by ICT, farmers will become aware of the latest agricultural tools and methods that make farming easy instead of the use of crude method. They can forms a group and hire these tools. At this point in time, it is pertinent to say that one does not claim to have exhausted what ICT can do for agriculture with the above discussion. The role of ICT in agriculture is enormous.



5. Tables and Figures

Table 1.1: Foods Production, Demand with Shortfalls and Imports (Million Metric Tons)

Description	1994	1995	1996	1997	1998	1999	2000	2001
Product-ion	86.70	89.25	93.35	95.64	98.74	100.41	102.12	103.86
Food demand	87.23	89.55	96.26	99.03	101.87	104.63	107.46	110.37
Short fall	(0.53)	(0.30)	(2.91)	(3.43)	(3.13)	(4.22)	(5.34)	(6.51)
Food Import	0.67	0.58	2.95	3.47	3.24	4.48	5.59	6.91

Source; Federal Office of Statistic (FOS). Review of Nigeria Economy, Various Issues.

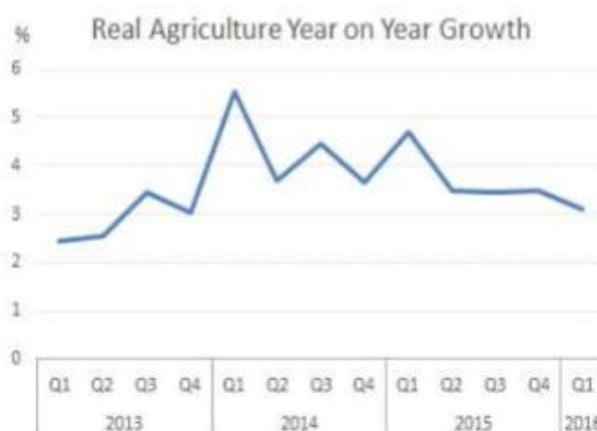


Figure 1.1: Growth rate of Agriculture

Source: National Bureau of Statistics, Nigerian Gross Domestic Product Report, Quarter 1, 2016

6. Conclusion

Information and communication Technology (ICT) is capable of lifting Nigeria's agricultural practice to the next level. It is a change agent we cannot ignore. Nigeria as a developing nation cannot be isolated from the wind of globalization. Application of ICT in agriculture has worked well in Korea, Japan, India and China, countries once regarded as undeveloped, but has now been lifted by ICT into leading positions in the comity of nations.

What Nigeria needs do now is serious investment on ICT infrastructures and making ICT facilities readily available to farmers at their door steps. The issue of adequate power supply is very important as far as ICT is concerned. Nigeria can learn from countries that have succeeded in agriculture through integration of ICT.

7. Other recommendations

Equalize the length of your columns on the last page. If you are using *Word*, proceed as follows:
Insert/Break/Continuous.

References

- [1]. R.A.I Anyanwuocha R.A.I (2006) Fundamentals of Economics for senior Secondary Schools, Onitsha, Africana first publishers, 2006.
- [2]. Central bank of Nigeria (2010): CBN Annual report 2010.
- [3]. P. Mukesh, T.P. Deepati, B. Kanini, "ICT for Agriculture Technology Dissemination", 2001. [Online]. Available: [#8230.](http://agropedia.iitk.ac.in/?q=content/ict-agriculture-technology-di) [Accessed: Dec. 09, 2014].
- [4]. G.N. Odachi, "Enhancing the Attainment of Millennium Development Goals through ICT", Journal of Science Education, Vol 9, No 1, 2009.



- [5]. G.N. Odachi, Journal of Research and Development, Volume 3 No 1, December 2011.
- [6]. V.N. Ozowa, "Information needs of small scale farmers in Africa". [Online]. Available: <http://www.worldbank.org/html/cgiar/newsletter/june97/9nigeria.html>. [Accessed: Dec. 09, 2014].
- [7]. S.O. Talabi, O.Onasanya, "Nigeria Agriculture- Introduction". [Online]. Available: <http://www.onlinednigeria.com/inks/agricadv>. [Accessed: Dec. 09, 2014].
- [8]. "Nigeria's Agriculture and Food Security Challenges".
- [9]. [Online]. Available: <http://www.foa.org/tc/qork05/Nigeria.ppt.pdf>. [Accessed: Dec. 09, 2014].
- [10]. A.I. Samuel, "Using ICTs to Bridge the Agricultural Extension Gap and in providing Market Access for Rural Farmers in Nigeria: A practical Approach".
- [11]. [Online]. Available: <https://www.google.com/ICT-in-agriculture-in-Nigeria.html>. [Accessed: Dec. 09, 2014].
- [12]. Hutching, Sawyer, "Computers, Communications, Information", Users Introduction, New York, Irwin McGraw Hill, 2000.

Authors Profile

PREYE OFUNAMA is a Lecturer with Federal Polytechnic, Ekowe, Bayelsa State, Nigeria. She is with the Department of Fisheries. Developing young individuals in the Agricultural sector via trainings, seminars, and workshops is the tool she uses. Also providing solutions to farmers in Aquaculture production, and the production of fish feeds for rural farmers is a mechanism to check cost of production.



WARI DENYEFA CLETUS is a lecturer in the department of computer science. Federal Polytechnic Ekowe, Bayelsa State, Nigeria. His research area covers field like computer programming, data structure and analysis and business development.

