

Communicating Agricultural Research to Farmers in Rural Areas in Nigeria: Key to National Development

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Abstract

Pervasive underdevelopment keeps characterizing our society while sponsorship for Agricultural researches is on the increase. Most communities in Nigeria are agrarian with rural farmers who have little or no access to modern technology nor can communicate in any language other than their indigenous languages. The objective of this study is to investigate the impact of the use of indigenous language as an appropriate mode of communication, in the dissemination of Agricultural research findings on the development of the knowledge of the rural farmers. The study used the instruments of questionnaire and semi-structured interview to elicit information from the sample population which consists of 107 Agricultural researchers and Extension Officers in the Root Crops Institute and Michael Okpara University of Agriculture both in Umudike, Abia State, Nigeria, and focus groups of 200 rural farmers from the institutions' host communities. The data generated from the questionnaire were analysed using mean simple equation and represented on a pie chart. The result shows that greater percent of the rural farmers are left in the dark of most of the scientific findings due to failure to communicate them using the appropriate language. The study therefore, concludes that there will be no meaningful development in a nation if the rural farmers who should provide food for the nation's teeming population, fail to access the right information for the development of their farming system.

Keywords: *Agricultural research, Communication strategy, development, extension service, Indigenous language and rural farmers*

Introduction

If a nation would develop at par or be ahead of others, appropriateness in the use of language and information dissemination must be given priority. There may be lofty ideas but without the appropriate means of communicating it to the right audience, it will die unceremoniously as communication is the soul of life. Many people and countries of the world are suffering and deprived not because of the dearth of ideas to solve their problems but because there is lack of the appropriate means of communicating the ideas necessary for the needed changes in life. Communicating research findings in developing nations especially Nigeria is an issue that bothers the mind. Many laudable scientific research have been conducted and most of them were carried out with grants and sponsorship from various donor agencies with the aim of actualizing a sustainable food and other development goals. There are institutions in Nigeria whose core mandates are to sustain agricultural development and food security in the nation. These researches are either done individually or in collaboration with different research institutions, (Ike Nwachukwu, 2017). However, it is actually worrisome how in spite of all these provisions, the people especially the rural farmers that host most of these institutions cannot boast of adequate knowledge of the modern or improved system of

farming. Hence, this study tries to investigate the use of indigenous language in the dissemination of agricultural research findings to rural farmers.

The Concept of Communication

Communication has been given various attentions from different domains. It is believed from the linguistic perspective that communication is not just human specific, all creatures that interact among themselves communicate (Tserdanelis & Wong, 2004; Age, Obinne & Demenogu, 2012; Oluikpe & Oluikpe, 2014). Communication, from some linguists' perspectives, deals with the exchange of ideas, information, etc., that involves two or more persons whereby there is mutual understanding among them. Food and Agriculture Organisation (FOA) of the United Nations (2006), in a similar vein upholds communication as a 'two-way process' whereby data and information are traded between/among two or more parties, whereby the communicators have schemata knowledge of the medium of exchange among them. Age, Obinne & Demenogu (2012) opine that communication is dynamic and cyclical. The cyclical nature of communication demands that the receiver of the message should send back a response to the source or sender based on what the understanding is and this is called the feedback.

The elements of communication include the following: source, message/information, channel/medium, receiver and feedback. In this study, the researcher who generates the information after a careful research is the source, the finding is the message, the farmers are the receivers, and the channel/medium can be any means by which the message would get to the desired recipient. This could be via verbal or non-verbal means. Age et al (2012, p.120) categorise channels in communication as follows: physical channels (e.g. visits, seminars, workshops, exhibitions, advisory village meetings, agricultural shows, etc.); non-physical channels (e.g. T.V, radio, any print media, etc.), technical channels, human discipline, token of communication (e.g. signals, gestures, and other forms of symbols). The feedback entails whatever response that emanates from the receiver as the message is digested. The feedback is very necessary because it helps the source to know those areas that need to be improved upon. It is obvious as we observe from most of the views above that communication must involve two or more parties, therefore, based on our context, we regard communication as that which takes place among the farmers in the rural areas; the extension workers and the agricultural researchers through an appropriate medium that will enable an understanding of the required information for sustainable development.

The extension service is an indispensable aspect of communicating research findings to the rural farmers. The extension workers are the intermediaries between the researchers and the rural farmers. Age et al (2012) describe the extension workers as the purveyors of technical and specialised information who need the required freedom to effectively carry out their responsibilities. They should also understand that the farmer is more knowledgeable in his experiences, problems and his indigenous practices which should not be jettisoned. There is meant to be an interpersonal relationship existing between the researcher and the extension worker and between the extension worker and the rural farmers. Obinne (1992) opines that they should have respect for whatever the farmers believe in - values, societal norms, language, etc. and show empathy for them. This kind of relationship, according to Soola

(1993), brings the desired behavioural change and result. The extension officers should be versatile in both modern technology and indigenous communication which should also involve the knowledge of the rural farmers' indigenous language and farming methods in order to carry them along and win their confidence.

Information Communication Technology (ICT) development in the world today has greatly advanced to the point that it makes communication and improvement in every area of life so feasible. Researchers no longer depend only on the non digital information technology (the mass media) such as radio, TV, newspapers, etc. but also on the digital technology for the communication of their findings. The digital technology makes room for easy and better processing, storage, dissemination, retrieval and exchange of information (USAID, 2003). The convergence of both digital and non digital information technology has contributed to reshaping the world and bringing it to the status of a global village. There is no kind of information that is sought that cannot be got at the snap of the finger on the internet. For this and some other reasons, the governments of many nations have embarked on ICT based Agricultural development. In Nigeria today, farmers now use phones (Ike Nwachukwu, 2017). However, the benefits of the ICT Agricultural development are not fully appropriated due to lack of infrastructural development. Majority of the farmers in Nigeria are poor and live in rural areas where they have no access to modern facilities/technology and internet. They are at the mercies of the extension workers to update their knowledge. Collaboration with linguists such as sociolinguists, translators and interpreters, language documentation experts etc. who have the expertise in language use and communication strategies will help in effective communication and interpretation of new inventions to the rural farmers in their indigenous languages and cultures.

Language and Indigenous Communication System

For humans, language is the basic means of communication, however, the use of language must be appropriate if the required results would be achieved. Language as a means of communication can act as serious constraint to the rural farmers accessing the right information. Ramos & Emurotti (2017), truly observe that science cannot be properly communicated or popularised unless language and cultural barriers are tackled. In this study, our interest is on effective communication using the indigenous language, having in mind that most rural farmers are uneducated. They lack both the writing and the speaking skills of the English language but at the same time have an already existing effective indigenous language with which effective communication can take place. Sinha, (2013), submits that the main drawback to the rural communities is reaching them through the appropriate communication channels. This refers to those means of communication that could be easily understood by them. In Sinha's (2013, p.4) words, "to develop the frame of mind of the people from rural and remote areas, to expel superstitions, to establish an opinion through proper argument and above all to extend the knowledge of scientific experiments, it is necessary to move science from laboratory to the grass root level".

According to Wilson (1987), indigenous communication system is a continuum and a vehicle for information dissemination, entertainment and education that can be useful in societies which have not been obviously displaced by globalization or any other external influence.

Nwosu (2013) lists some indigenous system of communication to include, the town crier, cooperative societies, town/village unions, voluntary organizations, drinking clubs, self-help groups, masquerade cults, market women associations, religious groups, choral groups and many others whose activities are geared towards effective communication. Salawu (2006) laments over the unhealthy influence of colonization in most developing countries especially as it concerns their indigenous communication. The people's indigenous languages are no longer esteemed, English language as well as the culture has been given the preferred seat. This has also adversely affected the indigenous language and the culture which is an intricate part of the language (Oko, 2017). Every language is a vehicle used in conveying the culture of a people, and it is indisputably right to say that the best way for people to be convinced and development achieved is in their language and through their culture.

Language and National Development

The place of language in national development can never be overemphasised. No society can grow above its communication system. Language is key to constituting nationhood and consolidating national development. Lado (1964) asserts that language is intimately tied to both man's feelings and activity and is also bound up with nationality, religion and the feeling of self. The potentiality of language as a vehicle for the conveyance of culture, ideas, values, beliefs, information and norms, among others, remains the determining force in the development of nationhood. Development as Oyelaran (1988) and Adediji (1992) express it, is not limited to education, politics, culture, technology but cuts across all facets of human life. It is a constant and appreciable phenomenon. Olusoji (2012, p.4) citing, Awolokun (1995), views national development as "a minimum socio and political development in the building of a national identity. The ability of a country to improve the social welfare of the people by providing social amenities like quality education, water, good roads, access to health care facilities, etc. accounts for the development of that nation". However, none of these developments strides can be achieved without the use of the appropriate language as a means of communication. Hence researchers and other stakeholders should see that the rural farmers are not left in the dark of the various research findings that will help improve their agricultural production which will in turn engender national development.

Theoretical Framework

This study is contextualized on the theory of communicative competence. Communicative competence as a concept was coined by Hymes (1972), supported and improved by Canale & Swain (1980, 1983); Bach, (1990). It is focused on the appropriateness of the use of language. This means for effectiveness in communication, the four *Ws* must be considered. They include the following in communication: who, where, when and how in communication. The language user must consider who the listener is, the environment where the speech act would take place, the appropriate time for the communication and the medium of communication. Canale & Swain (1983) include the verbal and non verbal communication strategies. These strategies are involved when there is a breakdown in communication due to performance variables or insufficient competence. Strategic competence involves what the speaker should do when the message is misunderstood so as to avoid a lacuna.

Hymes (1970) in his view about human communication posits that communication must be active, which warrants that both parties involved in the communication process must have a common knowledge of communicative competence. Feedback is also an essential part of the communicative process. However, he does not deny the fact that there may be some situational constraints in human communication. Bell, (1981, p.125) uses the acronym *SPEAKING* to elucidate these constraints in human communication as: *S* means setting (time and place and scene, the cultural definition of interaction), *P* means participants (the senders and receivers of the messages), *E* means ends (the outcomes, results, intended or otherwise of the communication and the goals, actions, etc.), *A* means acts (the form and sequence of the message; how the message is communicated), *K* means key (the manner in which the message is delivered), *I* means instrumentalists (the channels- written, spoken, etc., used for the transmission of the message), *N* means norms (expectations concerning the conduct of the interaction which govern the behaviour of the speaker(s) and the hearer(s) and their interpretation of the messages), finally, *G* means genre (type of interaction readily identifiable by the language used).

Some research works have assessed communicating scientific discoveries to the rural dwellers. Sinha, (2013) focuses on the importance of technological development in the dissemination of information among rural dwellers. He maintains that the mass media such as television, newspapers and radio are veritable tools in communicating research discoveries to rural dwellers but observes that some factors such as lack of education, poor financial funding deny these rural farmers access to important information. He therefore suggests that for meaningful development to take place in these remote areas, documentary films and participatory communication through agricultural fairs should be organised. These will afford the people the privilege of exchanging laboratory experiments to field experiments.

Nigussie (2017) in his study also examined the use of indigenous communication forms in conveying food security messages in endemic food insecure areas of Irob and Gulomekeda Districts in Eastern Tigray, rural Ethiopia. The study shows that there are no strategic means of communicating information on food security in the area except through the frequent public meetings which are dominated by opinions of government officials and development agents and had little or no value to add to their livelihood. The rural respondents suggested that the government agents and food security experts should adopt the locals' indigenous means of communication in disseminating information on food security seeing its potency in mobilizing communities and making the people actively involved in activities.

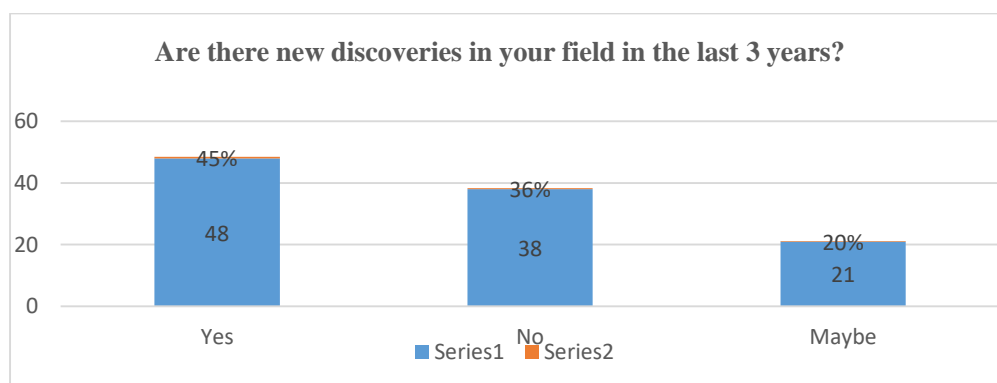
Age, et al (2012), in another research, focuses on communication as a potent sociological tool for agricultural and rural development. The paper views the various aspects of communication and the barriers associated to it as it concerns sustainable rural and agricultural development in Benue State. It concludes by saying that pursuing and harnessing the full potentials of the rural populace towards achieving a sustainable and holistic agricultural development will be like a pursuit of shadows. They therefore recommend that target audience should be selected and addressed based on their needs and agro ecological areas. They also suggest that the decentralization of agricultural messages through the radio and television should be encouraged.

Ahamefule (2013), in a related survey, gives credence to indigenous communication as enabling factor for rural development in Nigeria. He embarked on an anthropological field work in Mbano, South East Nigeria where he adopted a multi-stage and purposive sampling methods to examine the rural development efforts as they relate to the use of indigenous media. He observes that a lot of factors have hindered the full realisation of development in the rural areas of Nigeria; that the best form of development is participatory development which involves the rural people; that the use of indigenous communication is important to socio-economic development of the rural communities. He therefore, concludes that participatory development is ideal and must cost a good knowledge of the culture of the people which is the bedrock of indigenous communication. All the works reviewed so far are related to our present study because they emphasise the need to communicate research findings to the rural dwellers/farmers; the role of indigenous communication in rural and national development. However, the need to use the indigenous language of the rural farmers in communicating research finding is the call of this study.

Methodology

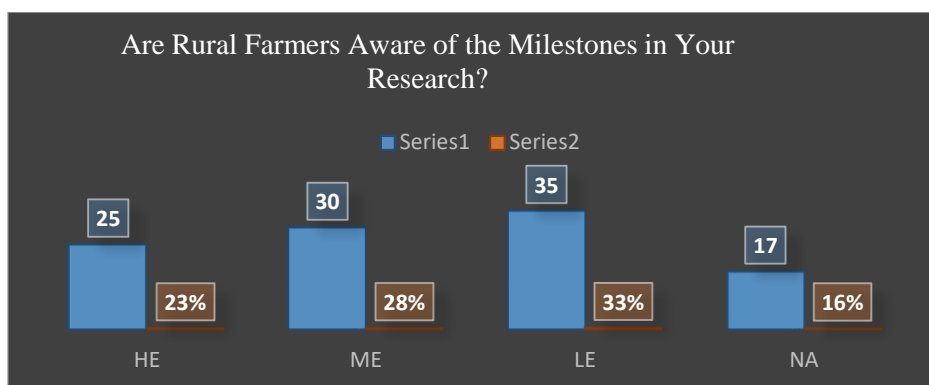
For this study we adopted both quantitative and qualitative research paradigms. We generated data through the use of the instruments of questionnaire, interview and focus group discussion especially for the uneducated rural farmers. Sample consists of 107 Agricultural researchers, few Extension officers from the National Root Crops Institute and Michael Okpara University of Agriculture both in Umudike, Abia state, Nigeria and 200 rural farmers from the institutions' host communities, namely: Amaba, Olokoru, Umuariaga and Umudike. These are rural communities inhabited by mostly rural farmers who mainly depend on subsistence farming. The sample technique employed was purposive sampling so as to get the appropriate target population. The questionnaire was structured both in specific open form of (Yes, No, Maybe) and four point likert scale responses thus: (HE: High Extent, ME: Moderate Extent, LE: Low Extent, and NA: Not at All). The information generated from the responses on the questionnaire were analysed using mean simple equation and represented on a pie and bar charts while the responses generated from the interviews and focus group discussions, formed part of our analysis and discussions in this study.

Findings: Question 1



From the chart above, 48 respondents that amount to 45% said Yes, there are findings in their field in the last 3years, 38 respondents which represent 36% said No while 21 respondents which represent 20% opted for maybe. The result shows that there are researches being carried out in the field of agriculture. This has authenticated our claim that discoveries are actually being made which are supposed to improve the well being of the farmers whether they are rural or urban dwellers and others consumers of agricultural product in society.

Research Question 2



From the above table, 25 respondents which represent 23% went for HE, 30 respondents which represent 28% opted for ME, 35 respondents which amount to 33% said LE, while 17 respondents which represent 16% said NA

Research Question 3

To what extent do you collaborate with the extension workers?

Options	Number	Percent
HE	17	16%
ME	35	33%
LE	30	28%
NA	25	23%
Total	107	100%

The table above shows that greater percentage of the researchers do not collaborate with the extension workers in the institution in order to see that their findings get to their target audience. Further inquiry on this point shows that there is lack of interpersonal communication between the researchers and the extension workers who are supposed to be the channel of information dissemination to the rural farmers. We observed from interaction that there is a superiority tussle existing among them. The extension officers have the responsibility of bringing to the knowledge of the researcher the progress report so as to enable him know areas of improvement or need among the rural farmers. Age et al. (2012) in

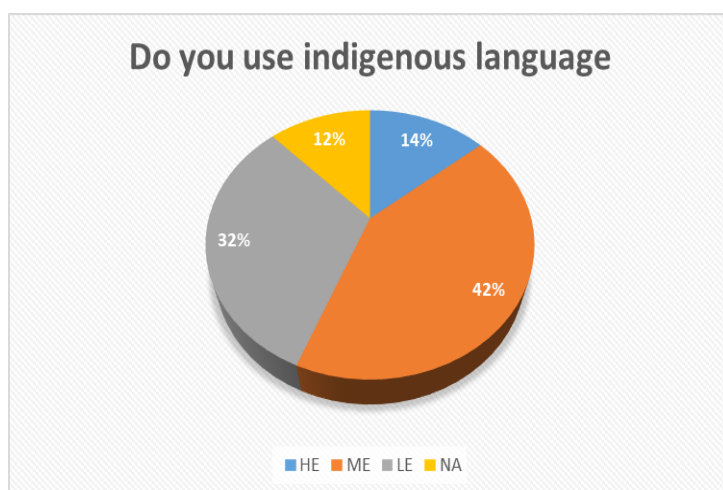
view of researchers/ extension workers' interpersonal communication advice that the parties involved should claim equality because every party has a special role to play. While the researchers generate their findings, the extension workers do the job of a purveyor of the information bringing into play their expertise on the technical terms and at the same time their indigenous communication knowledge.

Research Question 4

What channel do you use to communicate your findings?

Options	Number	Percent
Agric exhibition	15	14%
Journal	79	74%
Extension service	13	12%
Total	107	100%

Research Question 5



Discussion

Communication is a key element of social interaction, learning and capacity building process in Agriculture and rural development, (Lewis & Aarts, 2011; Rivera & Sulaiman, 2009; FAO 2006). It is quite disheartening that most researchers are only interested in publishing their findings without recourse to the rural farmers especially the subsistence farmers whose livelihood depend on that. These farmers are also major contributors to both rural, national and international development. Meaningful development will not be feasible at the national level if the rural areas are not developed.

Communication for development should have the rural farmers as the centre of attraction. Therefore, concerted efforts should be made in ensuring that they are being carried along.

This is achievable by using means, most likely indigenous, that they are conversant with to communicate with them. The responses of the researchers concerning the awareness of the farmers on the various milestones in their areas of research show that majority of the researchers have little knowledge on how much information their target audience (farmers) have about their findings. This is very disturbing because it shows that the communication cycle is not complete. The researchers should be concerned about the impact of their discoveries on the lifestyle and farming development of the farmers. This should be the evidence of the researchers' hard work.

Rural farmers should be their major concern and not necessary those who read about their breakthrough on the internet. Unfortunately, as Ike Nwachukwu, (interview, 2019) observes, most of these rural dwellers do not have access to the internet facility and modern communication gadgets. Mchonu (2003), Okiyi (2005), Sinha (2013) and some other researchers believe that access to the meaningful information is key to development, especially development of the rural dwellers.

The table for question three shows that greater percentages of the researchers do not collaborate with the extension workers in the institution in order to see that their findings get to their target audience. Interviews with some extension officers and agric researchers on this point show that there is lack of interpersonal communication between the researchers and the extension workers who are supposed to be the channel of information dissemination to the rural farmers. We observe from interaction that there is a superiority tussle existing among them. The extension officers have the responsibility of bringing to the knowledge of the researchers the progress report on the impact of their research so as to enable him know areas of improvement or need among the rural farmers. Age, et al (2012) in view of the researchers/extension workers interpersonal communication, advice that the parties involved should claim equality because every party has a special role to play. While the researchers generate their findings, the extension workers do the job of purveyors of the information and bring into play their expertise on the technical terms and at the same time their indigenous communication knowledge.

The response to the fourth inquiry which was represented on a table shows that most research findings end up in journals on the internet or at the shelves in university libraries. Dalton (1970) opines that in order to have a sustainable development in a rural society, it is expedient that that the underlying communication pattern of the society must be understood. The researchers and agricultural development stakeholders have a big challenge at hand in ensuring that the lofty ideas from researchers are not wasted on the minority elite who have little or no need for them than the majority rural farmers who need improvement on their farm processes and livelihood. Ogwezzy (1999) and Akpabio (2003) assert that over the years, the African communication system has been able to sustain the rural populace through their various categories. They also believed that it enabled a level of consistency in their development.

Today, the rural dwellers are neither here nor there, cut away from the modern technology, yet they do not use their indigenous means of communication. Sinha, (2013, p.3) asserts as follows "the rural people earn their livelihood through agriculture...Newly invented fertilizers, seeds, cultivation procedure and style can change their lives also. Due to these

techniques, the poor people will experience advancement in life". Lack of adequate orientation or awareness on how to manage the numerous natural endowments in the rural areas, has led to different levels of crisis that have dragged the development of the people centuries backward.

Conclusion

The study with focus on communicating agricultural research findings to rural farmers has been able to expose that many researchers come up with new ideas that should be of great benefit to the farmers in the rural areas but the ideas end up on the internet for the elites; there is little or no efforts to interpret and communicate the agric research findings in the indigenous language or indigenous knowledge system of the rural farmers; most rural farmers are more comfortable with their indigenous knowledge system of farming; lack of interpersonal relationship between the researchers and the extension service workers; finally, the number of extension workers available in different areas is not sufficient for the role of interpreting and communicating the research findings, especially to the rural farmers in their indigenous language.

Recommendation

The study recommends that researchers in the field of science should collaborate with linguists or language experts to see that their findings are effectively translated into the indigenous languages using appropriate indigenous terms to replace those in English, Spanish, French as the case may be. Rural Sociologists and other experts in the field of humanities should also be involved and sponsored by the Federal Government to help in reaching the farmers with the appropriate means that make them (rural farmers) receptive to any change in the system that is not indigenous to them. Universities of Agriculture should encourage researchers' open day where rural farmers will come to the university and get first-hand information on the newest development in the field using their indigenous language. Linguists should be involved in extension services as it will guarantee effective communication processes among researchers and rural farmers. The government should have formidable monitoring team that sees to it that farmers in the rural areas are not in any way marginalised, having in mind that their development is the development of the nation at large.

References

- Age, A.I.; Obinne C.P.O.; Demenogu, T.S. (2012). Communiucation for sustainable rural development in Benue State, Nigeria. *Sustainable Agriculture Research*. Vol. 1 (1), 118-129.
- Adediji, O. (1992). *Emerging trends in Nigeria local government*. Ibadan: Adefila Commercial Printers.
- Akpabio, E. (2003). *African communication systems: An introductory text*. Lagos: B Print Publications.

Bachman, L.F. (1990). *Fundamental consideration in language testing*. Oxford: Oxford University Press.

Bell, R.T. (1981). *An introduction to applied linguistics: Approaches and methods in language teaching*. London: B.T. Batsford.

Canale, M. & Swain M. (1980). Theoretical bases of communicative approaches to second language teaching and testing. *Applied Linguistics*, 1(1), 1-47.

Dalton, G. (1970). *The Economic System. A Handbook of method in Cultural Anthropology*, R. Narrel and B.J. Cohen, (eds.). New York: Columbia University Press.

Food and Agriculture Organization of United Nations, (2006). Effective rural communication for development.

Hymes, D. (1970). On communicative competence. In J. Gumperz and D. Hymes (eds.) *Directions in sociolinguistics: The ethnography of communication*. 269-93. New York: Holt, Rinehart & Winston.

Lado, R. (1964). *Language teaching: A scientific approach*. New York: McGraw Inc.

Lewis, C. & Aarts, N. (2011). Rethinking communication in innovation process: Creating space for change in complex systems. *The Journal of Agricultural Education and Extension*. Vol.17 (1), 21-36.

Mchonu, K. (2003). Case studies: Impact of information to rural development: Background, methodology and progress. In M. Kamba (ed.), *Access to information: The dilemma for rural community development in Nigeria*. Retrieved from www.goggles.com March10, 2019.

Niggusie, H. (2017). Indigenous communication forms and their potential to convey food security messages in rural Ethiopia. [Http://doi.org/10.1177/09737030176998895](http://doi.org/10.1177/09737030176998895).

Nwachukwu, I. (2017). *Agricultural communication: Principles and practice*. Umuahia: SCCDR Publishers.

Nwachukwu, I. (July, 2019). Interview. Directorate of Agricultural Reseach Extension Service, Michael Okpara University of Agriculture, Umudike, Abia state .

Nwosu, I.E. (1987). Research Training for Rural Development and Communication: Adopting the Tri-Modular Training and Sequential Research Models. *Africa Council on Communication Education. Jrica Media Review, Vol.1(2)*

Nwosu, I.A. (2013). Indigenous communication as an enabling factor for rural development in Nigeria. *International Journal of Development and Management review, Vol. 8 (1)*

Obinne, C.P. (1992). Effective communication in agricultural extension. *Productivity*. Vol.33, pp. 309-316.

Ogueri, E.I. and Nnamdi, V. (2010). Sustainable rural development in Nigerian issues and facts. *International Journal of Sustainable Development. Vol. 2 (3)*

Okiyi, R.B. (2005). Using libraries as tools for education and national development in the 21st century. *Information on Social Change*. No. 21

- Oko, O.L. (2017). English in developing nations' indigenous language. *Ndunode: Calabar Journal of the Humanities*. Vol.12 (1). 184-193.
- Olusoji, O.A. (2012). Eeffects of English language on national development. *Greener Journal of Social Sciences*. Vol. 2 (4), 134-139.
- Oluikpe, B. & Oluikpe, E. (2014). *Principles of second language development: Processing, theories and issues*. Onitsha: Africana First Publishers.
- Oyelaran, O.O. (1988). Language marginalization and national development in Nigeria. *Ife Studies in English*. Vol. 2 (1) 1-13
- Ramos, A. & Empinotti, R. (2017). Indigenous languages must feature in science communication. Retrieved from [www.google.com on https://mg.co.za/.../](https://mg.co.za/.../) March 31, 2019.
- Rivera, W. & Sulaiman, R. (2009). Extension: Object of reform, engine for innovation. *Outlook on Agriculture*. Vol. 38 (3), 267-73.
- Salawa, A. (2006). Indigenous language media: A veritable tool for African language learning. *Journal of Multicultural Discourses*. Vol. 1 (1).
- Sinha, S. (2013). Science communication to expedite rural development: A case study. *Global Media Journal*. Vol. 4 (1), 1-10.
- Soola, E.O. (2002). Development communication: The past, the present and the future. In Soola, E.O. (ed.). *Communicating for development purposes*. Ibadan; Kraft Books Ltd.
- Tserdanelis, G. & Wong, Wai Peggy, (eds.), (2004). *Language file: Materials for an introduction to language and linguistics*. Columbus, Ohio: Department of Linguistics, Ohio State University.
- Wilson, D. (1987). Traditional media in modern African development. *African Media Review*, Vol. 1 (2), 84-104