Awareness and Uses of Science and Technology Information among Rice Farmers in Akwa Ibom State, Nigeria

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Abstract

This study set out to examine the awareness and uses of science and technology information among rice farmers in Akwa Ibom State, Nigeria. To this end, the survey research design using the instrument of questionnaire was used to determine the uses and gratifications of science and technology information among rice farmers in Akwa Ibom State. With a total number of 20,000 rice farmers in the state according to Rice Farmers Association of Nigeria, Akwa Ibom State chapter, Meyer's statistical method (1979) was used to determine the sample. To this end, 384 respondents were drawn for the study. It was found out in the study that rice farmers in Akwa Ibom State do not have adequate information on science and technology to assist them in their farming. Consequently, they end up making grave mistakes that are detrimental to their farm business. It is therefore recommended that information on science and technology should be made more commonly available so farmers can access them and thereby improve their productivity.

Key Word: Information, awareness, uses and gratifications, science and technology, Rice farmers

Introduction

A growing society is an informed society; the world has come to a stage where information is of the essence and any society who desires meaningful development must embrace information. We live in an information-driven society; as a result, there is absolutely no sphere of life where adequate, effective, prompt and up-to-date information is not necessary for growth and progress. Information is the lubricant that greases the bolts and joints of any organisation. It is the air that a person, group, organisation or people breathes upon to maintain its life. There is virtually nothing one can do without communication. Communication plays a vital role in our existence.

Several scholars have expressed their views and understanding of the term communication. While Hamilton (2011, p. 3) defines communication as the process of people sharing thoughts, ideas and feelings with each other in commonly understandable ways, Griffin & Bone, (2014, p. 5) see communication as the use of symbols by humans to create messages for other humans. Wood (2012, p.3), Wood, (2014, p.10) takes her shot at communication as a systemic process in which people interact with through symbols to create and interpret meanings. Also, Gamble & Gamble (2010, p. 4) define communication as the deliberate or accidental transfer of meaning. As Baran (2010, p. 4) simply sees communication as the transmission of a message from a source to a receiver, Verderber, Verderber & Sellnow, (2014, p. 7) defines communication as a complex process through which we express, interpret, and coordinate messages with others to create shared meaning, meet social goals, manage personal identity, and carry out our relationships.

From the foregoing, one unique feature in the above definitions of communication is the sharing of meaning. In fact, this is the true essence of communication as communication cannot be said to be what it is without meaning sharing in ways that the parties concerned can effectively understand. Communication is one activity that occupies our lives; we engage in communication constantly as we connect with, agree or disagree, influence, learn from, make choices, gather more information that shapes our existence and worldviews, among others. Everybody needs communication irrespective of class, age, status, ethnic group, career, even farmers alike. Their daily in tune with happenings around them and beyond is necessary for a successful engagement in their farming.

Information can only gain momentum when it is given adequate awareness. Awareness is a state where one is conscious and can perceive events around him. The world has come to a stage where science cannot be ignored especially as we navigate an increasing scientific and technological world. People need to be better informed about technological advances, breakthroughs and innovations in an understandable and comprehensible way. The task of keeping the public abreast of happenings around her is majorly that of the media- print, electronic, internet, etc. The media possesses the task and responsibility of raising public awareness on developments in science and technology. Other sources of information includes expert opinions, personal experiences, internet, libraries,

Consequently, farmers, most importantly rice farmers, are dependent on daily and up-to-date information that is required for a smooth farming operation. This information includes information on how to control pest and diseases, sources of improved seedlings, latest varieties, changing weather patterns, environmental hazard, finance and access to loan, improved agronomic practices, marketing information and the likes. The information obtained can also help farmers identify records of efficiencies that results in higher productivity and profitability, ways of achieving more at a lowest possible cost, appropriate use of fertilizer, among others. Farmers can only get to strengthen what they know or unlearn negative farm practices through information. They need to reach out and connect professionally, (Griffin & Bone, 2014).

Rice as the most consumed food in Nigeria and a staple food for more than half of population of people in the world; requires prompt attention in order to sustain its production the world over. Hollaus, Schunko & Vogi, (2022) note that rice farmers grow rice in a variety of agroecosystems, depending on their environmental and social settings and on the agricultural technology systems applied.

Akwa Ibom State, a state in the South-Eastern Nigeria is a state endowed with numerous natural resources to include oil and agricultural produce like rice, maze, coconut, citrus, yam, cocoa, plantain, vegetables, livestock farming, among others. As an agricultural state with a heavy reliance on agriculture by her residence, agriculture has become a major component of development championed by various governments in the state. In a bid to boost food production, the Akwa Ibom State government has supported rice farmers in the clearing of many hectares of farmland and provision of a one-point-five metric ton per hour rice mill at Ikot Essen in Ibiono

Ibom Local Government Area in collaboration with the Federal Ministry of Agriculture, for easier processing of rice and its availability in quantities and at affordable price.

Science and Technology

Our understanding of the natural and physical world is a product of science borne through observations and experiments. Technology on the other hand is an art or ability employed into creating and developing innovations. The knowledge of science aids in the development of technological ideas to combat scientific challenges. Science and technology have brought with them a plethora of new tools and technologies available for farmers today on all aspects of farm operations. They play a vital role in ensuring the farmers get access to information regardless of their agro-ecological location. Through information and communication technology farmers derive information on activities of other farmers in other areas of the globe. The information and knowledge gained will help improve efficiency and service delivery in the farm, improve decision making for farmers, good pre and post-harvest practices, improve productivity, improve their farming skills as well as result in high crop yield.

Science technology thrives on the wings of information and communication technology which plays an unprecedented role in the agricultural sector. Technology here comprises of those networks, mobiles, devices, services and applications that assist farmers in managing, exchanging information, sharing knowledge and meeting up with trends in the sector. This includes television, radio, cell phones, internet, geographic information systems, sensing technologies, drones, big data, and the likes. This technology facilitates a better and more effective communication and delivery system. The long wait previously encountered in feedbacks have been bridged through a new, advanced and a more advanced technology which allows farmers to keep surfing for new ways of cultivating, harvesting, storing as well as distribution of their produce.

Science and technology has come to be; It has revolutionized the ways of doing things and made easier previously drudgery tasks. Farmers are able to stay abreast with recent information such as a more advanced ways of enhancing the quality of crop production. Knowledge of science and technology is present in every field of life; it can computing technology, health technology, satellite technology, biotechnology, biological sciences, information technology, natural science, veterinary science, agricultural technology, among others.

In the agricultural technology, science and technology plays a key role of ensuring the provision and processing of food and fibre production- soil, crop, animal cultivation, etc. In rice farming, several innovations have been recorded to aid rice cultivation. For instance, the International Rice Research Institute (IRRI), a global research organisation, developed rice production product called Crop Manager- a computer programme designed to assist rice farmers in tasks like nutrient management and fertilizer selection. Others include biofortification, hybrid grains, among others. The question now is: how many rice farmers have access to these technologies? The focus of this research is rice farmers in Akwa Ibom State, Nigeria.

The presence of these gaps between rice farmers, their awareness and uses of science and technology information is of utmost concern. Tsingo & Behrman (2017) note that technological innovations in agriculture have transformed the farming systems farmers leading to the realisation of economic incentives of higher outputs, profits and sustainability. Also, Lijie, Jiajia, Qiong & Dong-joo (2022) stress the importance of rice technological modes. These are more are attempts at emphasizing the need to allow technology unhindered access to rice farmers for optimal production.

This study set out to examine the awareness and uses of science and technology information among rice farmers in Akwa Ibom State. It is an established fact that for any society to enjoy any meaningful development there must be widespread and timely dissemination of information. In the agricultural sector for instance, the need for information cannot be over-emphasized as many farmers in civilized climes have come to embrace agricultural communication as a boost to crop yield in the pre and post-production of crops. In this century and with the advent of digital technology, science and technological information have been receiving time to time improvement on information as regards crop production. The information of yesterday may not be essential today hence the need for farmers to stay abreast with the trends in the sector.

In a specialised farming like rice cultivation, up-to-date information is essential if farmers must break the genes of subsistent farming and graduate into large scale farming production. As has been observed overtime, rice farmers in Akwa Ibom State are still holding fast to the traditional ways of cultivation and this system has not given them the big bang in production. Hence, rice production in Akwa Ibom State has been scarcely for consumption with very limited exports. One then wonders if the reason for the low yield in rice production is attributory to the level of

awareness or dearth of science and technology information among rice farmers. This however is been suspected as the reason for the poor yield as well as detrimental farming activities among these farmers. The question then is: what is the level of awareness and uses of science and technology information among rice farmers in Akwa Ibom State?

Objectives of the Study

The objectives of this study are to:

1. ascertain the level of knowledge of science and technology among rice farmers in Akwa Ibom State,
2. find out the sources of information on science and technology mostly used by rice farmers in Akwa Ibom State,
3. examine the uses of science and technology information among rice farmers in Akwa Ibom State,
4. examine the gratifications of science and technology information among rice farmers in Akwa Ibom State, and to
5. identify the challenges Akwa Ibom State rice farmers face in the absence of science and technology information.

Research Questions

The following research questions were derived from the study objectives:

1. What is the level of knowledge of science and technology among rice farmers in Akwa Ibom State?
2. What are the sources of information on science and technology mostly used by rice farmers in Akwa Ibom State?
3. What do rice farmers in Akwa Ibom State use science and technology information for?
4. What gratifications do rice farmers in Akwa Ibom State derive from science and technology information?

5. What are the challenges Akwa Ibom State rice farmers face in the absence of science and technology information?

Theoretical framework

This study is hinged on the uses and gratifications theories respectively. Wood (2004, p. 31) opine that theory offers an account of what something is, how it works, what it produces or causes to happen, and what can change how it operates. The uses and gratifications theory came due to the need to study why people choose to consume various forms of media and the gratifications they sought. Propounded by Jay Blumer and Elihu Katz in 1974, the theory characterises media users as active in the selection of the media they consume. According to Hasan (2010), the "uses" approach assumes that audiences are active and willingly expose themselves to media while the term "gratification" refers to the rewards and satisfaction experienced by audiences after the use of media. Another scholar, Folarin (1998) points out that people are actively influencing the effect process, since they selectively choose, attend, perceive and retain the messages from media messages on the basis of their needs and beliefs. People do not use media passively; they are engaged and motivated in their media selection. On the basis of those principles, uses and gratifications goes on to outline five assumptions:

- Media use is goal-directed. People are motivchated to consume media.
- Media is selected based on the expectation that it will satisfy specific needs and desires.
- Media influence on behavior is filtered through social and psychological factors. Thus, personality and social context impact the media choices one makes and one's interpretation of media messages.
- Media are in competition with other forms of communication for an individual's attention. For example, an individual may choose to have an in-person conversation about an issue instead of watching a documentary about the issue.
- People are usually in control of media and therefore are not particularly influenced by it.

The uses and gratifications theory stresses the power of choice individuals possess over the media. Media messages have different effects on media audiences. Although people may take in the same media messages, each of them is impacted differently in their individually oriented ways. People seek out specific media to satisfy specific needs. This explains how people use the media

for their own needs and the satisfaction they get when their needs are fulfilled. For rice farmers who have basically cognitive needs to acquire knowledge, facts and information to aid their farming, they need to stay abreast with current trends in order to avoid grave consequences.

Studies on Adoption of Improved Rice Farming Technology

Several studies have lend support to this study. In a related study on Adoption of Climate Smart Agricultural Practices by Rice Farmers in Akwa Ibom State, Nigeria, Etim & Ndaeyo (2020) observed that rice production has been adversely affected by rising temperature and varying rainfall resulting in reduced productivity. With the aid of oral interview and questionnaires, information was elicited from 90 farmers. Data were analyzed using descriptive statistical tools and univariate probit model. Findings showed that education level of farmers, family size, farm income and access to information on climate change were positively and directly related to rice farmers willingness to adopt climate smart agricultural practices. Result also showed that 55.85 per cent of rice farmers received information on climate change from village meetings, friends, relatives and other farmers.

In another study on Agricultural Cooperatives and Training of Male and Female Farmers on Improved Rice (Oryza sativa) Production Techniques in Ini Local Government Area, Akwa Ibom State, Nigeria, Etim Asuquo & Osu (2022) found out that farmers (male and female) were not efficiently trained in agricultural cooperatives and improved rice production techniques. In their recommendation, they called for periodic training sessions for rice farmers through the use of facilities and demonstrations in the farm.

Also, Ambali, Areal & Georgantzis (2021) in a study on Improved Rice Technology Adoption: The Role of Spatially-Dependent Risk Preference, using data from a field experiments and a survey conducted in 2016 in Nigeria, found out that risk adverse (risk avoidant) farmers are less likely to adopt High Yield Varieties (HYV), with the spatial lags of farmers' risk attitudes found to be a good instrument for spatially unobserved variebles (e.g., environmental and climatic factors. The authors concluded that studies supporting policy action aiming at the diffusion of improved rice varieties need to collect information, if possible, on farmers' risk attitudes, local environmental and climatic conditions)e.g., climatic, topographic, soil quality, pest incidence) in

order to ease the design and evaluation of policy actions on the adoption of improved agricultural technology.

In a related development, Zarmai, Okwu, Dawang & Nankat, (2014), undertook a review of Information Needs of Rice Farmers: A Panacea for Food Security and Poverty Alleviation. According to the scholars, rice is the most important food crop in the world, being the staple food for more than half of the world's population, predominantly in Asia and Africa where more than 90% of the world's rice is grown and consumed. From their findings, information is very vital and is one of the most valuable resources in agricultural development. Accordingly, all attention geared towards agricultural production by government and non-governmental organisations must take cognizance of the importance of information needs of rice farmers, access and utilization of same in order to meet the ever increasing challenges of food security and alleviation of poverty for a stable economy. They recommended farmers' adult and literacy programme to help farmers acquire basic skills and abilities to seek and receive needed agricultural information through modern communication channels, among others.

A review of these studies reveals that rice farming is an aspect of agricultural practice that has been given prior attention by researchers. It is in this regard that this study was borne out of the need to find out the level of awareness and uses of science and technology information among rice farmers in Akwa Ibom State Nigeria. The recommendations reached at the end of each study will help in improving agricultural development not only in Nigeria but in the world at large.

Methods

This study adopted the survey research method to draw the population for the study because it allows for the study of people, their opinions and perception on any given issue that interest the public. The population of this study comprised of rice farmers in Akwa Ibom State which amounted to 20,000 members according to statistics as recorded in the Association of Rice Farmers in Akwa Ibom State document. With a total number of 20,000 rice farmers in the state, Meyer's statistical method was used to determine the sample for this study. The multi-stage sampling technique was used. Furthermore, the cluster sampling was used to divide Akwa Ibom State into clusters. These clusters are the three senatorial districts in the state- Ikot Ekpene, Uyo and Eket senatorial districts. Available sampling was later used to select respondents at the last stage. To

this end, 384 respondents were drawn for the study. Out of the 384 copies of the questionnaires administered on the respondents, 372 copies were filled and returned.

Data presentation

Table1: Level of knowledge of science and technology among rice farmers in Akwa Ibom State

Level of knowledge	**Frequency**	**Percentage%**
Greater knowledge	62	17%
Little knowledge	288	77%
No knowledge at all	22	6%
Total	**372**	**100%**

Data from Table 1 indicates that majority of the respondents (77%) have little knowledge of science and technology among rice farmers in Akwa Ibom State.

Table 2: Sources of information on science and technology mostly used by rice farmers in Akwa Ibom State

Sources of Information	**Frequency**	**Percentage%**
Television	50	13%
Radio	92	25%
Internet	56	15%
Newspapers/Magazine	**54**	**15%**
Opinion leaders/colleagues	**120**	**32%**
Total	**372**	**100%**

Significantly, most of the respondents in Table 2 derive information on science and technology mostly from opinion leaders and colleagues. This may be due to the poor access to other source of communication.

Table 3: Responses on what rice farmers in Akwa Ibom State uses science and technology information for.

Responses	**Frequency**	**Percentage%**
Follow-up on trends	46	12%
Weather reports	23	6%
Financial services	166	45%
Marketing information	54	14%
Outbreak of diseases	28	8%
Latest varieties	33	9%
Not at all	22	6%
Total	**372**	**100%**

Responses in the table above indicate that rice farmers in Akwa Ibom State utilize science and technology information for a variety of reasons.

Table 4: Gratifications rice farmers in Akwa Ibom State derive from science and technology information

Gratifications	**Frequency**	**Percentage%**
High productivity	23	6%
Low cost	52	14%
Appropriate farming skills	22	6%
Appropriate application of fertilizer	22	6%
Improved seedlings	44	12%
Absence of drudgery	26	7%
Partnership	24	6%
Good record keeping techniques	28	7%
Access to better production strategies	22	6%
Awareness on trends/innovations	21	6%
Crop protection	22	6%
Improved soil fertility	24	6%
Address challenges	21	6%
Science-based rice planting solutions	21	6%
Total	**372**	**100%**

Data in Table 4 above show the various gratifications rice farmers in Akwa Ibom State derive from science and technology information.

Table 5: The challenges Akwa Ibom State rice farmers face in the absence of science and technology information

Challenges	**Frequency**	**Percentage%**
Unavailability of irrigation facility	32	9%
Poor soil quality	34	9%
Lack of finance	37	10%
Weeds	23	6%
Poor weather condition	30	8%
Lack of suitable land	23	6%
Poor access to modern rice farming techniques	42	11%
Lack of knowledge	43	12%
Poor yield	23	6%
Pests and diseases problems	42	11%

Poor storage system	22	6%
High cost/ inadequate fertilizer	21	6%
Total	**372**	**100%**

Table 5 above indicates the different challenges faced by rice farmers in Akwa Ibom State in the absence of science and technology information which includes poor access to modern rice farming techniques (11%) and lack of knowledge (12%).

Discussion

This study was set out to determine the uses and gratifications of science and technology information among rice farmers in Akwa Ibom State. Table 1 indicates that majority of the respondents (77%) have little knowledge of science and technology among rice farmers in Akwa Ibom State, however, about 6% are less informed about science and technology. Knowledge is said to be power; where rice farmers are well equipped with science and technology information, rice farming will not only be made easy but cheap. Technology cannot be equated with manual labour. The emergence of technology into the agricultural sector has helped in making previously difficult task easier and achievable in the less possible time. This has helped rice farmers in tremendous ways although it may not be so for those who do not understand or are tight to the traditional ways of farming at the neglect of the modern.

Although science and technology information is of the essence for rice farmers, the sources through which they receive this information should not be ignored. Significantly, most of the respondents in Table 2 derive information on science and technology mostly from opinion leaders and colleagues. This may be due to the poor access to other source of communication. One then cannot ascertain the authenticity of the information they receive from the supposed opinion leaders whether they are accurate or false. There are also records of other sources on science and technology information which are mostly the traditional media and the internet.

Responses in the Table 3 indicate that rice farmers in Akwa Ibom State utilize science and technology information for a variety of reasons. According to them, they use information on science and technology to follow-up on trends; get information on financial services such as loans and incentives, weather reports, disease outbreaks, and the likes. Evidences of these utilization is observed in the records of the benefits derivable from science and technology information is seen

in Table 4 as data here show the various gratifications rice farmers in Akwa Ibom State derive from science and technology information to include improved seedlings, low cost, absence of drudgery, among others.

In Table 5, rice farmers in Akwa Ibom state identified several challenges that impede the success of their farming. According toHollaus, Schunko&Vogi, (2022), to solve these problems, farmers applied preventive and reactive strategies based on traditional knowledge and scientific knowledge, resulting in a hybridization of knowledge system. This goes on to buttress the need for science and technology information to guide rice farmers in their operations.

Also in a similar study by Abdullah, Ghazanfar, Rehman, Ghazanfar & Saud (2013), farmers had no information which is usually disseminated by the agricultural extension department and were growing varieties of rice that were prohibited to grow in Pakistan. This reveals the need to equip farmers with the necessary information and guaranteed access to such information. Other researchers Nkwabi, Sharma, Dev & Sharma (2021), found out that most of the farmers were not very skillful in the use of farm inputs, particularly newly introduced improved technologies.

Conclusion and Recommendations

Among other sectors of our economy that requires urgent attention, the agricultural sector is one sector that needs information as an integral part of farming especially in the face of harsh economic realities. The time has come for a drastic shift from the traditional ways of rice farming into the embrace of modern farming techniques that will drive a robust economy and food sufficiency in our country. Information sharing is an enabler that allows rice farmers to bridge the gaps between the known and the unknown. Farmers have also identified the poor access to science and technology information which is traceable to the numerous challenges reported which could have been curbed if they had access to requisite information.

Access to information on science and technologies is therefore paramount in the success of rice farming. Without access to information on science and technologies, improve yields may be a mirage. Also, without internet access and speed to run the various applications, farmers who are in dire need of technological information may be far from it.

The study therefore recommends thus:

1. Science and technology information should be simplified by the media and extension workers so that farmers can make effective use of them.
2. Farmers need to utilize various mediums of communication to access rice-related science and technology information in order to improve their productivity.
3. Internet access should be increased especially in rural areas where most farmers can access at whatever time to choose to do so.
4. Increasing awareness on science and technology among rice farmers and simplifying the application of science and technology will encourage rice farming.

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