
Extension Agents Perception of Open Data Usage in Agricultural Communication in Abia State

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Abstract

The study assessed agricultural extension agent's perception of open data usage in agricultural communication in Abia State. Simple random sampling technique was used to select 83 extension agents for the study. Data for the study was collected with the use of questionnaire and described with frequency counts, percentages and mean. A moderate percentage (68%) of extension agents were aware of open data with only 15% and 7% having high and very high level of awareness. A relatively high percentage (54%) understand what open data is all about with only 49% consenting to be involved in the use of open data mainly at a moderate level (66%). Extension agents mainly perceive open data to facilitate agricultural research ($\bar{x} = 3.2$), facilitate access to research findings ($\bar{x} = 3.2$), give access to the work of other extension agents in other states ($\bar{x} = 3.2$), expose them to innovation in agriculture ($\bar{x} = 3.2$) and ensure timely access to all necessary information ($\bar{x} = 3.1$). The major challenges to the use of open data among extension agents were lack of fund to purchase internet bundle ($\bar{x} = 2.2$), unavailability of internet facilities ($\bar{x} = 2.1$), lack of basic ICT facilities ($\bar{x} = 2.1$) as well as lack of adequate knowledge of the use of ICT ($\bar{x} = 2.0$) and open data ($\bar{x} = 2.0$). Propagation of the use of open data could be done mainly by provision of ICTs in offices ($\bar{x} = 3.6$), training of extension agents to understand the concept of open data ($\bar{x} = 3.6$) and provision of internet facilities for extension agents ($\bar{x} = 3.5$). The study emphasized the need for Government through the Agricultural Development Programme (ADP) to provide basic ICT tools in offices and provision of internet facilities to enable extension agents maximize the use of open data.

Keywords: Open data, challenges, agriculture, extension agents

Introduction

Effective linkage between key players in the agricultural sector is one important way of improving the agricultural sector (Andrason & Van Schalkwyk, 2016). With the advent of mobile phones in many developing countries, agricultural communication is experiencing major changes. Though these changes may not be happening at an appreciable rate, more knowledge and skill in these ICT gadgets and applications may facilitate more use. In the Nigerian contemporary agricultural sector, accessing useful data, processing and managing it, is critical to innovation awareness and acceptance among the farmers. In addition, with increasing environmental and other critical challenges faced by farming households, it is important to embrace a timelier and accessible means of accessing and disseminating agricultural information among the users in the agricultural sector.

Verweij, Roosenschoon, Parr, Kamau, Macharia and Msengezi (2017) recognized open data as a driver for economic growth with the potential to contribute to Sustainable Development Goal of zero hunger. As data has become increasingly digital, and thus potentially much more accessible, there is an increased sensitization for the right to access information and knowledge as public goods. Open data simply involves making data available for anyone to access, use and share it while respecting any rights attached to it. When data is available to the people, it enhances institutional responsiveness and better decision-making by both policy-makers and citizens. Open Data by definition is accessible, interoperable, reusable and universal data. Laperrière (2019) emphasized that Open Data do not only allow wider access to historical and usable data that would enable farmers to develop their farming and production practices for the better, it also facilitates efficiency in anticipating and monitoring changes for instance weather variables and aids sharing crucial information across country borders leading to transfer of best practices across countries. The author noted that through the use of satellite data, remote sensing and mapping, stakeholders in agri-business, farmers inclusive can harness the most relevant and useful information to improve and adapt practices, make better decisions and ensure sustainability.

Also, the agriculture sector is currently increasing the combination of technologies, such as geolocation, soil and environmental conditions monitoring, Artificial Intelligence (AI), etc to uphold precision in combination of variables to improve the quantity and quality of agricultural products (Open data in the agriculture system, 2019). To successfully implement and combine these technologies, data particularly open data is very important. In other words, open data facilitates precision agriculture.

Open data is key to information transparency and scientific advancement, especially in Agricultural research. It exposes extension agents to the same raw data that scientists and policy makers use hence allowing them a more in depth understanding of concepts. The use of open data supports the development of a more analytical and collaborative network in the agricultural sector which is very instrumental to

generation of new knowledge and innovation. With the increasing emphasis on the use of digital tools in agricultural communication, the concept of open data becomes very important as digital tools will be of no benefit if the data to be disseminated is not accessible. Also, in the face of global covid-19 pandemic, agricultural information dissemination based on physical contacts becomes more limited, researchers in agriculture, governments, and funding agencies are beginning to embrace information dissemination using digital tools, without relevant and useful data being accessible, the use of these digital tools may not be maximally harnessed. Food and Agriculture Organisation (FAO) (2020) noted that the agricultural extension system needs to rapidly innovate to ensure sustenance of timely information dissemination.

The extension agents are the bridge between researchers and farmers. The responsibility of transferring research findings to farmers' rest mainly on the extension agents. Unfortunately, these extension agents are faced with numerous challenges in tackling this important task. Firstly, the agricultural system is a dynamic system with new challenges evolving over time. The extension agents need constant update of their knowledge-base in order to remain valid and effective in their work. Having access to relevant and timely information will help them in updating their knowledge. Secondly, the problem of shortage of extension agents in the system is a major challenge to effective information dissemination. Extension agent-farmer ratio in Nigeria particularly Abia state is poor and cannot support an effective information dissemination. Making data open and accessible to both extension agents and farmers will enhance the use of digital tools, hence ensure more effective information dissemination by the few available extension agents. Improved access to, and use of, open data at grassroots, local, national and global levels holds the potential to transform both long-standing and emerging problems as well as finding solutions that benefit farmers and global food security in timelier and less expensive manner.

Global Open Data for Agriculture and Nutrition (2018) noted that because open data is accessible, usable and sharable by anyone, it is speedily giving solutions to problems that would otherwise be expensive, time intensive or impossible to solve using closed data sources. It explained that making open data work in the agriculture sector requires a shared agenda to increase the supply, quality, and interoperability of data, alongside action to build capacity for the use of data by all stakeholders. Proper understanding of the extension agent's perception of open data usage and the challenges they faced in the use of open data is very important as this will help proffer more effective means of open data usage as well as harnessing more its potentials.

Objectives of the study

The broad objective of the study was to assess agricultural extension agent's perception of open data usage in Agricultural communication in Abia state

The specific objectives were to:

1. determine awareness of open data concept among extension agents;
2. determine extension agent's perception of open data usage in agricultural communication;
3. identify the challenges to the use of open data among extension agents; and

4. ascertain ways of propagating open data usage among extension agents.

Methodology

This study was conducted in Abia State, Nigeria. Abia State occupies about 6320 square kilometers with a projected population of 3,727, 347 (National Bureau of Statistics, 2017) situated between longitude 7° 22' 0.01" E and Latitude 5° 06' 23.69" N.

The population of the study consist of all the extension agents in Abia State. Simple random sampling technique was used to select eighty-three (83) extension agents from the total of 106 extension agents in the state. Structured questionnaire was used in the collection of data for the study and the data obtained was analysed with frequency counts, percentages and mean.

Agricultural extension agent's perception of open data and ways of propagating open data was captured using a 11 item statements and 9 item statements respectively rated on a Four-point Likert-type scale which was assigned values of 4(strongly agree), 3(Agree), 2(Disagree) and 1(Strongly disagree). A midpoint of 2.50 was obtained, with the decision rule that the extension agents agree with statements with mean score of 2.50 and above and disagree to statements with mean score less than 2.50. Challenges to the use of Open data by the extension agents was captured using an eight item statements rated on a Three-point Likert type scale which was assigned values of 3(major challenge), 2(moderate challenge) and 1 (minor challenge). A midpoint of 2.0 was obtained and decision rule was that statements with mean score of 2.0 and above are major challenges to open data usage while those with mean score less than 2.0 are not major challenges.

Results and Discussion

Awareness of Open Data among Extension Agents

A moderate percentage (68%) of extension agents were aware of open data with only 15% and 7% having high and very high level of awareness. Findings imply that awareness of open data among extension agents was relatively low while the level of awareness was quite low. This could impact the use of open data as people hardly adopt what they are not aware of. Only 54% understand what open data was about, with 49% consenting to being involved in the use of open data, while 66% were involved at moderate level.

Table 1. Awareness of open data among extension agents

| Variable | Percentage |
|---|-------------------|
| Aware of open data | 67.5 |
| Level of awareness of open data | |
| Low | 15.7 |
| Moderate | 28.9 |
| High | 14.5 |
| Very high | 7.2 |
| Understand what open data is all about | 54.2 |
| Involvement in the usage of open data | 49.4 |
| Level of involvement in use of open data | |
| Low | 7.2 |
| Moderate | 65.9 |
| High | 14.6 |
| Very high | 12.2 |

Source: Field Survey, 2019

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The result as presented in Table 2 shows that out of the 12 item statements used to capture extension agents' perception of open data usage in agricultural communication, the extension agents agreed to 9. They mainly perceive open data to facilitate: agricultural research ($\bar{x} = 3.2$), access to research findings ($\bar{x} = 3.2$), access to the work of other extension agents in other states ($\bar{x} = 3.2$), timely access to all necessary information ($\bar{x} = 3.1$); exposes them to innovation in agriculture ($\bar{x} = 3.2$) and is time consuming ($\bar{x} = 2.7$).

Results imply that extension agents in the study area have right perception of open data. This is an indication of readiness to adopt open data usage. Ifeanyi-obi (2016) noted that awareness and right understanding of contemporary concepts in agriculture is a prerequisite to farmers' readiness to adopt. People can only adopt what they understand and have proper disposition to. In addition, extension agents' right perception of open data could be attributed to the fact that majority (72%) of them hold at least a bachelor's degree. Level of education is known to be a major determining factor in understanding and adoption of innovation in agriculture. Okoli, Okereke, Onubuogu and Esiobu (2014) noted that high level of education is an added advantage for achieving understanding, huge income and running efficient and sustainable agribusiness enterprise.

Table 2. Agricultural extension agent's perception of open data usage in agricultural communication

| Statements | Mean | Standard deviation |
|--|-------|--------------------|
| Open data is not useful for extension agents | 1.8* | 0.7 |
| I am not educated enough to use open data | 1.6* | 0.6 |
| Open data is time consuming | 2.7** | 1.5 |
| Use of open data among extension agents will facilitate timely access to all necessary information | 3.1** | 1.9 |
| Open data exposes me to innovation in agriculture | 3.2** | 0.9 |
| I can easily access the work of other extension agents in other states through open data | 3.2** | 0.8 |
| Open data exposes my data to risk of loss of privacy | 2.8** | 0.7 |
| Information accessed through open data are not reliable | 1.8* | 0.5 |
| Open data usage facilitates agricultural research | 3.2** | 1.7 |
| Extension agents can access research findings easily through open data access | 3.2** | 1.5 |
| Use of open data will facilitate marketing information hence enhance agricultural system | 3.1** | 1.6 |

Source: Field Survey, 2019: ** $\bar{x} \geq 2.5$, * $\bar{x} < 2.5$

Challenges to Use of Open Data among Extension Agents

The major challenges as indicated by the extension agents were lack of fund to purchase internet bundle ($\bar{x} = 2.2$), unavailability of internet facilities ($\bar{x} = 2.1$), lack of basic ICT facilities ($\bar{x} = 2.1$), lack of adequate knowledge of the use of ICT ($\bar{x} = 2.0$) and open data information is a very vital resource for development in any sector ($\bar{x} = 2.0$). This corroborates with Bakker and Addison (2019) which identified poor ICT infrastructure and power supply, (digital) illiteracy and high costs of services as major barriers to adoption and scaling up of ICT for Agriculture initiatives in rural areas. Access to timely relevant information will help farmers in making informed decision. Unfortunately, access to information in the agricultural sector is faced with several challenges and this has reduced the rate of agricultural development. Oyindeinbofa (2017) noted that the lack of access to basic agricultural knowledge and information by rural farmers in Nigeria contributes to poor crop and livestock productivity. He further explained that access to information and knowledge are very vital in agricultural development of any community and where they are poorly disseminated the community's agricultural development becomes highly impeded. Extension agents are the major key players in ensuring timely information access to farmers, improving their access to information through open data usage will contribute in ensuring farmers receive necessary information timely. Akinngbe, Ezeuzo and Onwubuya (2017) found weak communication and linkage among farmers and extension service providers to be a challenge in reaching these rural women. The use of open data will help in filling this gap as extension workers will have more access to information and disseminate same to farmers timely.

Table 3. Challenges to use of open data among agricultural extension agent

| Statements | Mean | Standard deviation |
|---|-------|--------------------|
| Involves internet which is not readily available | 2.1** | 0.8 |
| Lack of basic ICT facilities needed in the office | 2.1** | 1.1 |
| Do not have an android phone to access the internet | 1.6* | 0.5 |
| Lack of fund to purchase internet bundle | 2.2** | 0.7 |
| Lack of adequate knowledge on the use of open data | 2.0** | 0.7 |
| Don't find useful information in my area | 1.4* | 0.6 |
| Fear of losing my basic data (loss of privacy) | 1.8* | 0.9 |
| Do not have basic ICT knowledge to use open data | 2.0** | 0.5 |

Source: Filed Survey, 2019: ** $\bar{x} \geq 2.0$, * $\bar{x} < 2.0$

Strategies to Propagate Open Data Usage for Agricultural Communication among Agricultural Extension Agent.

Provision of ICTs in the office ($\bar{x} = 3.6$), training of extension agents to understand the concept of open data ($\bar{x} = 3.6$), provision of internet facilities for extension agent ($\bar{x} = 3.5$) and sensitization of extension agents to appreciate open data benefits ($\bar{x} = 3.5$) were the major ways of propagating open data usage indicated by the extension agents. Training is an important activity in every sector in order to improve the capacity of staff. Zikhali (2017) stated that training is a vital tool in improving the quality of labour force, which in turn contributes to national economic growth. It is important to organize training for extension agents on open data to help them learn the basics of open data usage. This could help to increase their use of open data. Also, extension agents could be equipped to access different online training courses on open data. These are very useful too in upgrading their knowledge on open data. In the same vein, Man, Saleh, Hassan, Zidane, Nawi, and Umar (2016) highlighted that training results in more motivation, increased knowledge and value of human resources among extension agents in Iraq. Lack and inadequate provision of needed resources and facilities has been a major detrimental factor to effectiveness of extension agents in Nigeria. Most of the ADP offices in the country are poorly furnished with the basic infrastructure needed for effective performance lacking.

Table 4. Strategies to propagate open data usage for agricultural communication among agricultural extension agent

| Statements | Mean | Standard Deviation |
|--|-------|--------------------|
| Provision of basic ICTs in the offices | 3.6** | 1.9 |
| Provision of internet facilities for extension agents | 3.5** | 0.9 |
| Sensitization of extension agents to appreciate open data benefits in agricultural communication | 3.5** | 1.5 |
| Having more agricultural database that could enhance easy access to agricultural information | 3.2** | 1.4 |
| Training of extension agents to understand the concept of open data | 3.6** | 1.7 |
| Development of policies to support the use of open data | 3.3** | 1.8 |
| Developing specific policies that protect one's data in open data community | 3.1** | 1.4 |
| Having defined ethics in the use of open data | 3.1** | 1.6 |
| Having institutional structures that support the use of open data | 2.9** | 0.9 |

Source: Field Survey, 2019: ** $\bar{x} \geq 2.5$, * $\bar{x} < 2.5$

Conclusion and Recommendations

Extension agents are both aware and involved in the use of open data. However, they see open data as time consuming, but exposes them to innovation in agriculture, while provision of fund is the major challenge they have in the use of open data.

Sensitization of agricultural extension agents through government or intervention agencies organized workshops and seminars will educate extension agents to appreciate open data benefits in agricultural communication. The need for government to provide basic ICT's for extension agents in their offices as well as provision of internet facilities is recommended to encourage and enhance usage of open data by extension agents. In addition, provision of fund for purchase of internet bundle by the Extension Department of the Agricultural Development Programme (ADP) is a necessary incentive to propagate open data usage among extension agents.

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