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Research Paper

Assessment of agricultural information sourcing and linkages between research and extension organizations in Benue State, Nigeria

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The study assessed agricultural information sourcing and linkage between research and extension organizations in Benue State, Nigeria. Simple random sampling was used to select a total of 32 respondents each from Agricultural Development Project/Benue State Agricultural and Rural Development Authority and the University of Agriculture, Makurdi. Primary data were collected using structured questionnaire. Data collected were analyzed using descriptive statistics. Results revealed that 37.5% of researchers sourced their agricultural information from research findings and journals, agricultural development project staff sourced their agricultural information from subject matter specialists. On the factors affecting linkage, researchers: 37.5% top-down policies, agricultural development project staff: 50% lack of motivation, rate of contact between researchers and extension agents: researchers, 62.5% fair, agricultural development project staff: 62.5% fair, relationship between researchers and extension agents, researchers: 62.5% very weak, agricultural development project staff: 75% weak and on communication link, researchers: 62.5% scientific publications and agricultural development project staff 62% subject matter specialists. It is recommended that varied sources of agricultural information should be made available to agricultural resource persons, top-down linkage policies should be avoided and agricultural development project staff should be motivated.

Keywords: Agricultural information, sourcing, linkages, research, extension, organization

INTRODUCTION

The importance of information in the development of agriculture cannot be overemphasized. This is because extension practitioners depend largely on information to communicate effectively with target audience (Bronstein, 2010). The reasons users' select a specific information source have become of great importance because of developments in the field of information in the past decades. Information source preferences of users have been affected by the development of computers and telecommunications technologies, the information explosion and the availability of a whole range of modern information technologies for the efficient use of information resources, one consistent finding in the literature has been that, in most cases, when choosing among sources of information available to them, users will base their decision upon the single criterion of least average rate of probable work (Allen, 1977; Anderson *et al.*, 2001; Culnan, 1983; O'Reilly, 1982).

Research, extension and farmers are the three main pillars of agriculture system and their effectiveness largely depends on strong linkage among one another. Hence, strong interaction and effective collaboration among these stakeholders is essentially needed to achieve the common objective of increasing agricultural production and to uplift the living standard of the rural poor (Yenesew *et al*., 2016). Agricultural research without appropriate linkages to extension may neither be aware of the difficulties faced by farmers (knowledge of which is crucial to formulating appropriate research) nor know how their findings are applied (Pezeshki-Raad and Dehkordi, 2006).

Information is any message or news viewed, read or told verbally which add to knowledge, awareness or understanding of some issues or problem that prepares somebody for uncertainty of life. Information means many things to many people depending on the context of usage. Scientifically, information is processed data it is also considered to be that which aids decision making. Information could also be visualized as a commodity, which could be bought or sold. Information is whatever is capable of causing human mind to change its opinion about the current state of real world.

Information plays a pivotal role in our society at all times. Information is very crucial for everyday living of people all over the world, and it enables people to relate with one another including farmers (Kughur *et al*., 2015). Information is one of the basic human needs after air, water, food and shelter (Stanley, 1990). According to Camble (1992), in agriculture, information is required to manipulate factors of production such as land, labour and capital resources into meaningful and productive use. It is this recognized capacity of information to facilitate and bring about significant changes within an individual, group or a country that makes it so vital in the development process.The existence of weak linkages among the research and extension have been identified as a major drawback to generation, wider testing, dissemination and adoption of improved agricultural technologies (Yenesew *et al*., 2016). If the linkage among the agricultural knowledge system actors is weak, the flow of information is hampered either from research to extension or from extension to farmers thereby adversely affecting agricultural production and productivity (Adesoji and Tunde, 2012).

For agro-technologies to be relevant to local needs, researchers and extension workers should work together in identifying research problems, adapting research recommendations to local conditions and providing feedback to researchers about the innovations that have been developed (Yenesew *et al*., 2016). How well researchers and extension agents communicate and cooperate has a strong influence on whether agricultural production succeeds or fails as a catalyst of national development and a tool for eliminating poverty hence, strong linkage among researchers and extension services is essential (Yenesew *et al*., 2016).

The poor inter-organizational relationship between research and extension services almost guarantees that research results will not reach farmers and if they do, farmers will not be able to use them (Adesoji *et al*., 2006). Agbamu, (2006) identified one of the problems bedeviling agricultural extensions in Nigeria as ineffective agricultural research and extension linkage and poor input supply. Agbamu, (2006) identified poor feedback from farmers to researchers. However, the most obvious cases are those where researcher and technology transferred workers (extension agents) are ignorant of each other's activities. In Nigeria, what is obtainable or practice is that, research stops too early and extension starts too late in what should be a continuous process (Oladele, 1995). Also, basic extension directors as well as middle level managers within these respective organizations (research and extension) operate in an independent manner with little appreciation or understanding of how the management of their organization or programme affects the overall system performance (Olajide, 1978).

The lack of effective linkages and understanding of their importance among researchers and extension system may explain the present low adoption of technology and minimal research utilization in agricultural production systems. There is a growing mountain of shelved, perfected yet unutilized research outputs and there are large amounts of information getting tied up in journal publications targeted to peer groups rather than intended beneficiaries who rarely have access nor understand such publications. Yet, technology can solve many of the problems farmers and producers are facing today, for example, the constraints to increasing production, productivity and adding value, ensuring sustainable agriculture and rural development, bridging the digital divide and harnessing the benefits state-of-the-art innovations in the fields of agriculture, biodiversity, genetic engineering, bio-energy and environmental services, just to mention a few (Smith *et al*., 2004).

Information is very vital to human and societal development. Specifically, extension information is relevant to agricultural practices and development. Consequently, extension organizations play prominent role in dissemination of agricultural information for farmers' utilization (Fadiji *et al.,* 2005). Agricultural information is conceived as a productive resource potentially limiting and influencing the efficiency of production (Bawa *et al*., 2014). Agbamu (2006) observed that farmers' sources of information fundamentally shape the kind of decision they make. Access to adequate information is very vital to increased agricultural productivity (Mgbada, 2006). Farmers generate and use knowledge and are constantly experimenting to manage risks and improve their operations. According to Smith *et al*. (2004), farmers are therefore, the natural partners of researchers and their institutions for a mutual exchange

and reconciliation of modern and traditional knowledge. Farmers and their organizations are the main actors responsible for using and translating formal research results into real life production systems (as opposed to sometimes unrealistic controlled and experimental systems) and natural resource management practices

Government has made various efforts to build the capacity of the researchers and extension systems and strengthen their linkages to improve adoption and productivity. The linkage between research and extension plays a significant role in the generation and dissemination of appropriate technologies. Strengthening research and extension linkages must mean cultivating greater and more effective interaction among the stakeholders in the agricultural sector. To this end, several linkage initiatives have been tried out at different times with different levels of effectiveness The study therefore aim to investigate the factors affecting the relationship between agricultural extension workers and famers access to agricultural information.

SOCIAL NETWORK THEORY

This study is based on Social Network Theory; (SNT) is a social science concept that discusses the connection and relationship in a social structure (Kadushin, 2004). This theory emerged in the late 19th century attempts to find something that might connect people/organizations in their group or communities. According to Brass (1992), a social network is a generic way a set of nodes or actors are connected by a set of social relationships, ties, or a specified type of ties. The term “network” is generally used for the structure of ties among the actors in a social system (Nohria and Eccles, 1992). These actors could be roles, individuals, organizations, industries, or even nation states. Their ties may be based on conversation, affection, friendship, kinship, authority, economic exchange, information exchange, or anything else that forms the basis of a relationship. In a network, flows between objects and actors and exchanges, which might contain an advice, information, friendship, career or emotional support, motivation and cooperation, can lead to very important ties (Kadushin, 2004).

In all environments, linkage must build reputation-enhancing relationships with outside resource providers who are willing to share valuable information, technology, resource persons and finance among others. The use of SNT in organizations started in the 1980s (Birley, 1985). Organizations used their own informal business and personal networks to establish new linkages. For example, social network contacts are the most needed by new organizations to overcome their difficulties in getting suppliers and customers at the early stage of business formation. Network relationship refers to a strategy that focuses on creating and maintaining a lasting relationship between organizations and their network (Premaratne, 2002). Strong ties can be defined as the relationship between an individual and his kinship, close friends and family (Granovetter, 1982). Interaction with strong ties gives the person a stronger relation to the others. According to Granovetter (1982), strong ties show some key characteristics between the parties of the relationship, such as frequent interaction, extended history, intimacy and sharing, reciprocity in exchanges that allow for mutual confiding and trust-based interactions. Strong ties facilitate the flow of richer, detailed and redundant information and knowledge resources between individuals and their respective groups.

A conceptual framework for the functioning of the linkage, as shown in (Figure 1), can be conceived as having many parts which have been grouped into: the formal agricultural knowledge system embracing researchers and extensionists, linkage activities and methods; the farmers (the end users of technologies) and problems affecting the linkage activities. The agricultural research and extension system identifies farm families as their target and the hub around which researchers and extensionists focus their actions. The constraints which hinder research and extension linkage potentially affect the agricultural output of farmers, whereas effective links will enhance farmers output through the availability of farming innovations.

METHODOLOGY

The University of Agriculture, Makurdi, Nigeria and Benue State Agricultural Development Project (ADP) (Benue State Agricultural and Rural Development Authority, BNARDA) was the area of the study. The University established on January 1, 1988 has the tripartite mandate of teaching, research and extension services. Through this mandate, the university is supposed to among other things train manpower that is consistent with the requirements of an integrated research extension system.

The establishment of Universities of Agriculture came into effect on 1st January, 1988 following a demerger process that resulted in simultaneous coming on stream of the two Universities of Agriculture located in Makurdi in Benue State, and Abeokuta in Ogun State. A third one located in Umudike in Abia State was established in 1992. The Federal Government of Nigeria had by the end of 1983 established seven new Universities of Technology, four of which were rationalized in 1984 by merging them with, and as campuses of bigger and more established Universities as a cost saving measure. Following the initiatives and reports of the National Universities Commission (NUC) on the establishment of Universities of Agriculture, the government carefully reviewed the situation against the background of the success stories of Agricultural Universities worldwide and decided to opt for converting the two campuses at

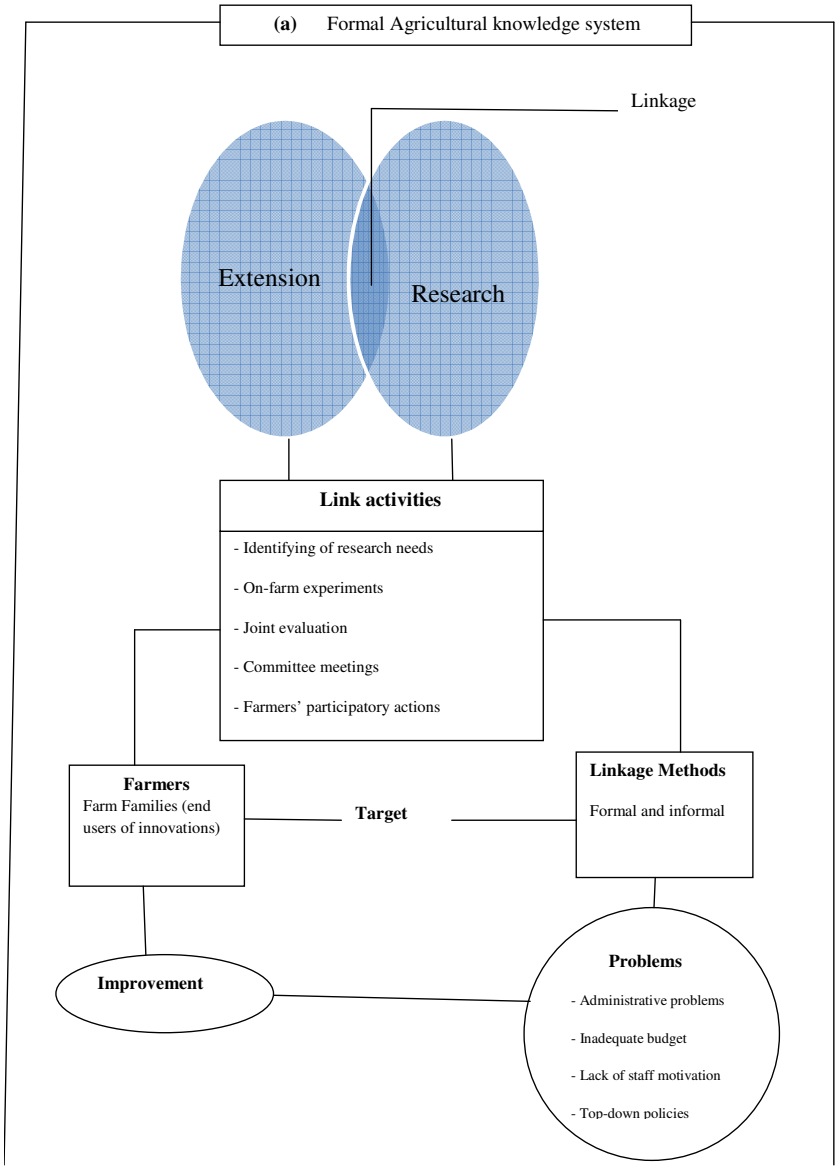

Figure 1. Formal agricultural knowledge system.

Makurdi and Abeokuta into full fledged specialized Universities of Agriculture. These universities run undergraduates and postgraduates programmes.

The Agricultural Development Projects (ADPs) were first launched as viable projects in 1972 only two years after the end of civil war, when Nigeria was facing its first food and fibre shock. The project was launched against the background of Nigerian agriculture which in the 1950s and 1960s had attained prominent expertise through complete reliance on small scale farmers. The main and first feature of the ADP was its reliance on the small scale farmers as the central focus for increased food production. The projects were funded under a tripartite agreement involving World Bank 66%, Federal government 20% and State government 14% in addition to payments of salaries of local staff. The two main objectives of the ADPs were to increase food production and to raise the income of small-scale farmers. The ADPs started three (3) pilot projects in 1975 covering one Local Government Area (LGA) in 3 States. The success of the pilot schemes lead to expansion to other LGAs and State in the late 70s and by 1984, all the states of the

Table 1: Sources of Agricultural Information by Researchers and ADP/BNARDA Staff

Source of information	Researchers		ADP/ BNARDA Staff	
	Frequency	Percentage	Frequency	Percentage
Research	12	37.5		
Journals	12	37.5		
Conference proceedings	6	25	4	12.5
Books	4	18.75	2	6.25
National Bureau of Statistics	3	9.38		
Periodicals	2	6.25		
Scientists	Nil	Nil	8	25
Subject Matter Specialists	Nil	Nil	20	62.5

Table 2. Factors affecting linkage activities between researchers and ADP/BNARDA staff.

Factors	Researchers		ADP/BNARDA Staff	
	Frequency	Percentage	Frequency	Percentage
Inadequate budget	8	25	2	6.25
Top-down policies	12	37.5	6	18.75
Administrative problems	6	18.75	8	25
Lack of staff motivation	6	18.75	16	50
Total	32	100	32	100

Federation implemented the project (Adegboye, 1991). The study comprises all staff of the University of Agriculture, Makurdi and Agricultural Development Project (ADP) in Benue State, known as Benue State Agricultural and Rural Development Authority with the acronym (BNARDA). Multi-stage sampling procedure was adopted to select respondents. From the University of Agriculture, Makurdi, College of Agricultural Economics and Extension and Institute of Food Security were purposively selected because of their direct involvement in linkage activities. In College of Agricultural Economics and Extension and Institute of Food Security 16 staff each was randomly selected from making a total of 32 respondents. From BNARDA, Agricultural Extension Department, Home Economics Department and Fadama Unit were purposively selected based on their direct involvement in linkage activities of the both institutions. Twelve (12) staff of Department of Agricultural Extension, 10 from Home Economics Department and 10 from Fadama Unit were randomly selected making a total sample of 32 respondents for each institution. Primary data were collected using structured questionnaire. Data obtained were analyzed using descriptive statistics.

RESULTS AND DISCUSSION

Results in (Table 1) indicates sources of agricultural information, for researcher: research, 37.5%; journals, 37.5%; conference proceedings, 25%; books, 18.75%; National Bureau of Statistics (NBS), 9.38% and periodicals, 6.25%. For BNARDA staff: conference proceedings, 12.5%; books, 6.25%; scientists, 25% and subject matter specialists (SMS), 62.5%. For researchers, a reasonable proportion (50%) obtained agricultural information from both conduct of research and journals. Researchers conduct research and a lot of first hand information are obtained from research activities. When research is conducted, certain conditions may be controlled to observe the performance of what is been investigated in absence of the conditions that were controlled. Researchers also read and obtained information from scientific publications. Reading of other scientific publications also helps researchers in reviewing literature on the subject matter. For BNARDA staff, most (62.5%) obtained agricultural information from subject matter specialists. This implies that the subject matter specialists were the main source of agricultural and scientific information for ADP/BNARDA staff. This is an indication that the training and visits (T&V) extension approach promoted by the World Bank actually provided agricultural information to the ADP staff using SMS. Researchers obtained agricultural information from conduct of research and journals therefore, things that would ensure smooth conduct of research and availability of journals among researchers should be encouraged and for ADP staff, T &V extension approach of the World Bank should be resuscitated by the state government to ensure that agricultural information from the SMS reach the extension agents and by extension farmers for properly utilization to improve their agricultural production and ultimately their standard of living. Results in (Table 2) show that for researchers: inadequate budget, 25%; top-down policies, 37.5%; administrative problems, 18.75% and lack of staff motivation 18.75%. For ADP/BNARDA staff: inadequate budget, 6.25%; top-down policies, 18.75%; administrative problems, 25% and lack of staff motivation, 50%. For researchers, the

Table 3. Rate of contact between researchers and ADP/BNARDA Staff.

	Researchers		ADP/BNARDA Staff	
Rate of Contact	**Frequency**	**Percentage**	**Frequency**	**Percentage**
High	2	6.25	2	6.25
Moderate	2	6.25	4	12.5
Fair	20	62.5	20	62.5
Poor	8	25	6	18.75
Total	32	100	32	100

Table 4. Relationship between researchers and ADP/BNARDA Staff.

	Researchers		ADP/BNARDA Staff	
Relationship	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Very strong	Nil	Nil	2	6.25
Strong	2	6.25	2	6.25
Weak	10	31.25	24	75
Very weak	20	62.5	4	12.5
Total	32	100	32	100

highest (37.5%) was top-down policies, while ADP/BNARDA staff lack of staff motivation was (50%). Most agricultural policies in Nigeria are formulated without the consideration of people that are directly affected. Governments constitute committees for policy formulation/review and such policies are formulated or reviewed without the input of the stakeholders. That is why most policies that were formulated/reviewed without the contributions of the stakeholders meet stiff resistance from many people who are directly involved in its implantation. Staff motivation is one of the key factors affecting staff morale in any organization. Motivation could be done in different forms including but not limited to prompt payment of staff salary, provision of means of mobility, attending of refresher courses, promotion, etc. This confirms Gebrehiwot *et al*. (2012) who stated that motivation and morale of extension workers in Nigeria are very low due to low incentives, high duties/burden of extension workers, and low infrastructural developments. In any situation, if staff involve in carrying out certain functions are not motivated they become demoralize, which affect the performance of the entire organization. Top-down linkage policies should be avoided and ADP/BNARDA staff should be motivated.

Results in (Table 3) show the rate of contact, for researchers: high, 6.25%; moderate, 6.25%; fair, 62.5% and poor, 25%. For ADP/BNARDA staff: high, 6.25%; moderate, 12.5%; fair, 62.5% and poor, 18.75%. For researchers, majority (62.5%) stated the rate of contact between researchers and ADP/BNARDA staff was fair (62.5%). For ADP staff, majority (62.5%) indicated that the rate of contact was fair. This implies that researchers and ADP staff's contact in the study area was rare. Researchers and ADP staff does not have a common forum for regular contact. This is a clear indication that researchers and ADP staff hardly meet except in rare cases. Furthermore, the number of ADP staff that would have contact with researchers in a year would be very meagre. This does not encourage linkage that could benefit farmers. Regular contact is recommended between researchers and extension staff, otherwise research findings would only remain in pages of papers (journals) without been tried by the farmers on a mass scale. The finding corroborates Smith *et al*. (2004) who stated that the lack of effective linkages, understanding and contact among researchers and extension system explain the present low adoption of technology and minimal research utilization in agricultural production systems. There is a growing mountain of shelved, perfected yet unutilized research outputs and there are large amounts of information getting tied up in journal publications targeted to peer groups rather than intended beneficiaries who rarely have access nor understand such publications. Yet, technology can solve many of the problems farmers and producers are facing today.

Results in (Table 4) show the relationship, for researchers: very strong, nil; strong 6.25%; weak, 31.25% and very weak, 62.5% and for ADP/BNARDA staff very strong, 6.25%; strong, 6.25%; weak, 75% and very weak, 12.5%. For researchers: majority (62.5%) stated that the relationship between ADP/BNARDA staff and researchers was very weak. For ADP staff the highest (75%) indicated a weak relationship. This is an indication that the relationship between researchers and ADP staff was weak. For agriculture to take its rightful place as it were in the 1970s a very strong relationship must exist between extension organizations and the research institutes. Upon this, strong relationship would extend to staff of both organizations. Without a good or strong relationship between extension organizations and

Table 5. Communication link between researchers and ADP/BNARDA Staff.

	Researchers		ADP/BNARDA Staff	
Communication link	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Scientific publications	20	62.5	2	6.25
Conferences	8	25	8	25
Technical reports	Nil	Nil	2	6.25
Others (formal and informal meetings)	4	12.5	20	62
Total	32	100	32	100

research institutes the research findings might not be able to reach the farmers. This corroborates with Agbamu, (2000) who reported that a strong relationship was expected between extension organizations and researchers for farmers to reap the full benefits of scientific findings.

Results in (Table 5) show the communication link, for researchers: scientific publications, 62.5%; conferences, 25%; technical reports, nil and others (formal and informal meetings), 12.5%. For ADP/BNARDA staff: scientific publications 6.25%; conferences, 25%; technical reports, 6.25% and others (formal and informal meetings), 62%. For researchers the highest (62.5%) scientific publications, while for ADP/BNARDA staff 62.5% others (formal and informal meetings). Researchers communicate through scientific publications using different media which include journals, conference proceedings, seminars and or workshops to inform others about scientific findings. Apart from informing the world about their research, publications are also use for promotion therefore, researchers published articles in journals to facilitate their promotion. This finding is similar to Adesoji and Tunde (2012) who stated that researchers communicate through publication using journals. For ADP/BNARDA staff their communication link was informal and formal meetings. This implies that unless there are meetings, the ADP/BNARDA staff does not have other better means of interacting with the researchers. Researchers have many means of communicating their findings to the public therefore; ADP/BNARDA staff should also find other means of communicating or interacting with researchers other than formal and informal meetings.

Conclusion and recommendations

Information sources obtained by researchers and extension services are in various forms. Some are in printed word via email, internet, radio and television, while others are traditional word via word-of-mouth, telephone or face-to-face communication. Lack of a close working relationship between agricultural research and extension organizations is one of the most difficult institutional problems confronting agriculture in Benue State. Research and extension organizations generally compete instead of working together and, frequently, leaders of these institutions do not see themselves as part of a broader system: the agricultural technology system (ATS). A good linkage system would improve the agricultural productivity of Nigeria. It is recommended that varied sources of agricultural information should be made available to agricultural resource persons, top-down linkage policies should be avoided and ADP/BNARDA staff should be motivated.

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