# Influence of Infrastructures on Agricultural Extension Service Visitations in Niger State, Nigeria

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## ABSTRACT
The study examined the influence of infrastructures on agricultural extension service visitations in Niger State, Nigeria. To achieve the study objectives, multistage sampling technique was used to randomly select 152 respondents for the study, using validated interview schedule with reliability coefficient of 0.79. Data collected were analyzed using descriptive statistics and regression model. Result showed that the mean age of the respondents was 58years, while the mean household size of the respondents was 6 persons. Findings indicated that radio signals, schools and motorable roads were the common infrastructural facilities available in the study area. The result further revealed that infrastructural facilities such as motorable roads, research institutes, telecommunication networks and electricity supplies had significant influence on extension service visitations in the study area. Therefore, it was recommended that rural telecommunication infrastructures should be provided by telecommunication companies to facilitate access to agricultural information and communication between stakeholders in agricultural extension service delivery. It was also suggested that agencies like National Fadama Development Project and Rural Access and Mobility Project should provide more feeder roads to open-up rural areas and ease transportation or movements of village essential service providers.
Keywords: Extension service, Influence, Infrastructures, Visitations, Niger State

## INTRODUCTION

Development in the agricultural sector in the developing countries is hinged on the effectiveness of the extension system that is in place, because in those countries the small-scale farmers depend on extension personnel for useful information necessary for their production activities (Okunlola, 2005). Agricultural extension service delivery involves educating farmers on improved farming techniques to increase farm productivity and income, as well as promoting socio-cultural, recreational and intellectual opportunities with attendant improvement in the welfare of rural dwellers.

Anderson and Feder (2004) reported that the objectives of agricultural extension services are to transfer practical useful knowledge from researchers to farmers, involving farmers in the process of making decision that affect their day to day activities and stimulating desirable agricultural

development. The authors further stressed that agricultural extension agents often render services that are not directly related to farm activities such as non-farm business management, health, home economics and nutrition. In apparent realization of the significance of extension services to agriculture and rural development, various governments in Nigeria introduced a number of extension systems such as Conventional extension system, Commodity extension system, University-based extension system, Training and Visit extension system, Community-based extension system and Unified agricultural extension system (Jibowo, 2005).

One of the most remarkable novelties in Nigeria's agricultural extension is the introduction of Training and Visit (T and V) extension system. The T and V extension system was adopted in Nigeria in a most excited fashion to acquaint farmers with new agricultural technologies and best agricultural practices through training and retraining and regular (fortnightly) extension visits to farming families.

However, Pinstrup-Andersen and Shimokawa (2010) said that agricultural and rural development depends largely on effective infrastructures. Infrastructures encompass roads, irrigation, electricity, Information and Communication Technologies (ICTs), health and school facilities among others. According to Fan (2004), the provision of those infrastructures will contribute to effective delivery of goods and services that promote prosperity, quality of life, social well-being, health, safety and economic growth. But in recent times, governments' dwindling developmental budget and poor progress in providing economic and social infrastructures has created a barrier between the farmers and extensions workers, which has hindered successful utilization of agricultural research and technologies. It is against this background that this study was carried out to determine the influence of infrastructures on agricultural extension service visitations, to provide information on the state of infrastructures and how they impact on

extension service delivery for policy making and necessary action by relevant agencies or investors. The specific objectives of the study are to: describe socio-economic characteristics of the respondents; ascertain infrastructural facilities available in the study area; and determine the influence of infrastructural facilities on agricultural extension service visitations.

## METHODOLOGY

The study was conducted in Niger State which is located within Guinea Savannah ecological zone of Nigeria. The State's coordinates is 10.2155$^{o}$ N, 5.3904$^{o}$ E. With annual growth rate of 3.4%, the State has estimated population of 5,337,149 in 2015, of which 85% of the people are farmers. Annual rainfall ranges from 1,100mm in the Northern part to 1,600mm in the Southern part of the State. The mean average temperature is around 32$^{o}$C. Some of the crops grown in the State include yam, cotton, maize, sorghum, millet, soybean, cowpea, rice and groundnut. While some of the tree crops cultivated are mango, citrus, cashew, banana, pawpaw. Livestock reared include goat, sheep, cattle, chicken, camel and donkey. The State has three Agricultural Zones (Niger State Geographic Information System, 2007).

Multistage sampling technique was used for the selection of respondents for the study. The first stage was random selection of one Local Government Areas (LGAs) from each of the three agricultural zones in the State. The selected LGAs are Lavun, Borgu and Gurara. The second stage was random selection of three villages in each of the selected LGAs. In the third stage, 10% of the farmers were selected in each village using simple random technique. Total sample size of 152 respondents was selected for the study from established sampling frame of 1520. Content validity of the instrument for data collection (interview schedule) was ensured through experts' consultation. The interview schedule which was further subjected to Cronbach's Alpha reliability test (0.79) was used by the researchers and enumerators for data collection in

December, 2017. Data were collected on socio-economic characteristics and infrastructural facilities. Socio-economic characteristics such as age and educational level were measured in years. While house hold size and extension contacts were measured in numbers. Sex and marital status were determined by asking the respondents to indicate their actual sex and marital status from the list of options provided. Infrastructures such as radio signal, television signal and telecommunication network were measured in numbers. While motorable road, library, school, health centre, internet, borehole and irrigation facilities were measured as dummy variables. Electricity supply was measured in hours and closeness to research institute was measured in kilometers. Descriptive statistics were used to achieve objectives one and two, while objective three was achieved using ordinary least square regression model. The model is specified implicitly and explicitly as follows:

$Y= F (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}\ e)$

$Y=a+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\beta_6X_6+\beta_7X_7+\beta_8X_8+\beta_9X_9+\beta_{10}X_{10}+\beta_{11}X_{11}+\beta_{12}X_{12}+e_1$

Where:

Y= Agricultural extension service visitations (Number of extension visits per year)

$\beta_1 - \beta_{12}$ = Parameters estimated

$X_1 - X_{12}$ = Independence variables

$X_1$= Motorable road (Access to motorable road=1, otherwise=0)

$X_2$ = Radio signal (Number)

$X_3$ = Television signal (Number)

$X_4$ = Library facility (Presence of library=1, otherwise=0)

$X_5$ = Electricity supply (Hours)

$X_6$ = Closeness to research institute (Kilometers)

$X_7$ = School (Presence of school=1, otherwise=0)

$X_8$ = Health centre (Presence of health centre=1, otherwise=0)

$X_9$ = Internet facility (Internet facility available=1, otherwise=0)

$X_{10}$ = Telecommunication network (Number)

$X_{11}$= Irrigation facility (Presence of irrigation facility=1, otherwise=0)

$X_{12}$= Borehole (Borehole available=1, otherwise=0)

*e* = error term

## RESULTS AND DISCUSSION

### Socio-economic Characteristics of Respondents

Table 1 showed that 78.9% of the respondents were male while 21.1% were female; this suggests that male farmers dominate agricultural activities in area, which may be attributed to the fact that male have more access to production inputs including extension services than the female due to cultural and religious barriers. The result also revealed that the mean age of the respondents was about 58 years. The result implies that majority of the farmers in the study area are ageing. This points the need for extension workers to encourage young individuals into the farming occupation during extension visitations in order to enhance the innovativeness of the respondents in the area. Table 1 indicated that majority (86.2%) of the respondents were married. Married respondents are likely to produce more food crops for their families and thus may need more information from agricultural extension agents. This assertion supports the view of Onu (2003) who stated that married status of the farmer has advantage for increased productivity and innovativeness since married people tend to be more committed to task in agricultural activities.

Furthermore, Table 1 showed that the mean family size of the respondents was 6 persons. Availability of family labour could motivate the respondents to produce more crops using the services of agricultural extension workers. Similarly, the result revealed that 38.8% each of the respondents attended primary and secondary education. In view of the fact that sizeable percentages of the respondents were literate in the study area, they can be easily taught or trained by the extension agents during visitations.

Result further showed that about half (47.4%) of the respondents had between 3-4 extension visitations during the production season. While 28.9%, 12.5% and 11.2% of the respondents had

between 5-6, 1-2 and 7-8 extension visitations, respectively. This result implies that majority of the respondents had 3-4 extension visitations in a year. When compared with Training and Visit (T&V) extension system which recommended fortnightly visits to farmers, the farmers in the study area can be said to be underserved by the extension agents and this can be attributed to inadequate infrastructures among others.

Table 1: Socio-economic characteristics of respondents

| Gender | Frequency | Percentage | Mean |
|---|---|---|---|
| **Sex** | | | |
| Female | 32 | 21.1 | |
| Male | 120 | 78.9 | |
| Total | 152 | 100.0 | |
| **Age** | | | |
| 20-30years | 2 | 1.3 | 57.84 |
| 31-40years | 3 | 2.0 | |
| 41-50years | 31 | 20.4 | |
| 51-60years | 63 | 41.5 | |
| 61-70years | 44 | 28.9 | |
| 71-80years | 9 | 5.9 | |
| Total | 152 | 100.0 | |
| **Marital status** | | | |
| Single | 3 | 2.0 | |
| Married | 131 | 86.2 | |
| Divorced | 11 | 7.2 | |
| Widow | 6 | 3.9 | |
| Widower | 1 | 7 | |
| Total | 152 | 100.0 | |

| | | | |
|---|---|---|---|
| **Family size** | | | |
| 1-6 members | 93 | 61.2 | 6.19 |
| 7-12 members | 59 | 38.8 | |
| Total | 152 | 100.0 | |
| **Educational status** | | | |
| No formal | 26 | 17.1 | |
| Primary | 59 | 38.8 | |
| Secondary | 59 | 38.8 | |
| Tertiary | 8 | 5.3 | |
| Total | 152 | 100.0 | |
| **Extension visits** | | | |
| 1-2 | 19 | 12.5 | |
| 3-4 | 72 | 47.4 | |
| 5-6 | 44 | 28.9 | |
| 7-8 | 17 | 11.2 | |
| Total | 152 | 100.0 | |

Source: Field Survey, 2017

**Availability of Infrastructural Facilities**

Findings in Table 2 indicated that radio signals were available in the localities of all (100.00%) the respondents. This point to the popularity of radio as a major source of information, because of accessibility of it signals even in the rural areas. Arokoya (2003) also reported that access to radio was higher compared to any other ICT for people living in rural areas. Schools are present in the communities of 63.8% of the respondents. The result further showed that 53.3% and about half (49.3%) of the respondents had motorable roads and health centres, respectively in their areas. Additional infrastructural facilities present the in the study area were electricity supply and telecommunication networks with 47.4% and 35.5% response rate respectively. Other infrastructures available in the study area with lower response rates were television signals

(28.9%), research institutes (25.7%), boreholes (15.1%), internet facilities (7.9%), rural community libraries (5.9%) and irrigation facilities (4.6%). The general inference that can be drawn from this result is that the respondents in the study area have low infrastructural facilities, which may hinder the provision of effective and efficient essential service delivery such as extension services in the rural areas. Those findings agrees with the report of FAO (2001) which stressed that electricity supplies, telecommunication facilities and other infrastructural services are limited in the rural areas.

Table 2: Distribution of respondents based on availability of infrastructural facilities

| Infrastructures | Frequency | Percentage |
|---|---|---|
| Motorable road | 81 | 53.3 |
| Radio signal | 100 | 100.0 |
| Television signal | 43 | 28.9 |
| Library facility | 9 | 5.9 |
| Electricity supply | 72 | 47.4 |
| Research institute | 39 | 25.7 |
| School | 97 | 63.8 |

| | | |
|---|---|---|
| Health centre | 75 | 49.3 |
| Internet facility | 12 | 7.9 |
| Telecommunication network | 54 | 35.5 |
| Irrigation facility | 7 | 4.6 |
| Borehole | 23 | 15.1 |

Source: Field survey, 2017

**Influence of Infrastructures on Extension Service Visitations**

Result in Table 3 revealed that access to motorable roads had significant positive influence on agricultural extension service visitations in the study area. This is likely because access to motorable roads throughout the year round would enable the extension workers to visit the clientele farmers any time or season unrestricted. The finding also indicated that closeness to research institutes significantly influenced agricultural extension service visitations positively in the area. This may be attributed to the fact that presence of research institutes in the vicinity of the respondents would make them more receptive to extension service visitations. Similarly, presence of telecommunication facilities had positive significant influence on agricultural extension service visitations in the area. Availability of signals of telecommunication networks will facilitate direct communication between the farmers and extension workers regarding dates and times of extension visits. This result affirms the finding of Umar (2015) who stressed that access to cell phone significantly influenced access to demand-driven extension services. Furthermore, availability of electricity power supplies had significant positive influence on extension service visitations in the area. This is expected because availability of power supplies

will make rural areas lively; thereby encouraging the extension workers to reside there for regular extension services or visits.

Table 3: Influence of infrastructures on extension service visitations

| Infrastructural facilities | Coefficients | T – ratios |
|---|---|---|
| Constant | 44783.3 | 1.20 |
| Motorable road | 79766.5 | 5.05* |
| Radio signal | 5986.6 | 1.58 ns |
| Television signal | 7.099055 | 1.74 ns |
| Library facility | 0.2453219 | 0.51 ns |
| Electricity supply | 1655.6 | 3.05* |
| Research institute | 772.59 | 7.28* |
| School | -29.5345 | -1.71 ns |
| Health centre | 0.41308 | 1.69 ns |
| Internet facility | 187.5668 | 0.87 ns |
| Telecommunication network | 749.938 | 4.76* |
| Irrigation facility | -24.7027 | -0.56 ns |
| Borehole | 34.0364 | 0.26ns |
| $R^2$ | 0.5796 | |
| Adjusted $R^2$ | 0.5666 | |
| F – ratio | 44.52 | |

Source: Computed from field survey data, 2017

***** = Significant at 5%
ns = Not significant

## CONCLUSION

Based on the findings of the study, it was concluded that majority of the farmers in the study area are ageing. Provisions of infrastructural facilities in the study area are low. Notwithstanding, infrastructural facilities such as motorable roads, research institutes, telecommunication networks and electricity supplies had significant positive influence on extension service visitations in the study area.

## RECOMMENDATIONS

In view of the aging farmers that dominate the farming activities in the study area, village extension workers should encourage young individuals into the farming occupation, in order to enhance the innovativeness of the farmers in the study area.

Provision of rural telecommunication infrastructures should be undertaken by telecommunication companies to facilitate access to agricultural information and communication between stakeholders in agricultural extension service delivery.

Also, electricity infrastructures should be extended to more rural areas by electricity companies to improve rural welfare and motivate essential service providers such as agricultural extension workers to reside in the rural areas for effective and efficient extension service delivery.

Research Institutes and Universities should establish more Adopted Extension Village Projects and demonstration plots in the rural areas, in order to increase extension service visitations to the rural farmers.

More feeder roads should be provided to the rural areas by agencies like National Fadama Development Project and Rural Access and Mobility Project (RAMP) to open-up rural areas and ease transportation as well as movements of village service providers.

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