Analysis of Determinants of Job Performance of Agricultural Extension Worker as a Leader to Farmers in Nigeria

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Abstract  
This study analysed the determinants of job performance of agricultural extension worker as a leader to Farmers in Nigeria. Data were collected from 240 randomly sampled households in Benue State, Nigeria using a structured questionnaire. Data collected were analysed using descriptive statistics and inferential statistics. The study showed that more than half (60%) of the agricultural extension workers had a moderate level of job performance. Leadership competency \( r = 0.65 \) had a moderately positive and significant relationship with extension worker’s performance while organisational commitment \( r = 0.69 \) had a moderately positive and significant relationship with agricultural extension workers job performance. The study indicated that 58.3% variation in agricultural extension workers job performance is accounted for by variations in leadership competency and organisational commitment. They explained the behavior of agricultural extension workers job performance at 76% level of confidence. The study showed a positive contribution of leadership competency and organisational commitment to job performance. It is recommended that in order to achieve a good performance of agricultural extension workers, appropriate agricultural extension policies and strategies should be tailored towards improving leadership competency skills of agricultural extension workers and enhancing their organisational commitment and job commitment to work with the rural communities.

Key words: Agricultural extension, extension workers, leadership competency, organizational commitment, work performance, Nigeria.

1. Introduction  
The Agricultural Development Programmes (ADPs) are currently responsible for carrying out the bulk of agricultural extension activities in the States of Nigeria as well as in the Federal Capital Territory, Abuja. The ADPs are designed to improve the agricultural productivity, income, and general well being of the small scale farmer who is the centre-piece of all agricultural development efforts in Nigeria (Asiabaka, 1991; Madukwe and Obibuaku, 1991; FGN, 1997).

The success of ADPs depend on a large scale adoption of improved agricultural technologies by farmers and brilliant performance of frontline extension workers, that is, extension agents (EAs), block extension agents (BEAs) and block extension supervisors (BESs), saddled with this responsibility (Akinsorotan and Adah, 1997). The performance of BESs depends partly on effective supervision from
the zonal extension officer (ZEO). Also, the performance of EAs/BEAs depends partly on effective supervision from BESs. Poor performance of the ZEO can result in performance failure of BESs. Poor performance on the part of the BES will largely lead to poor performance of EAs/BEAs and ultimately contact farmer groups/women groups (Benor and Baxter, 1984; Ekumankama, 2000).

Performance requirements are a determination of the acceptable behaviour directly related to the worker’s performance on the job or operation. The general requirements of most jobs are stated in the form of job descriptions or job specifications, and procedures or work methods. The manager should translate the requirements of the job into meaningful and, possibly measurable objectives so as to make performance requirements understood. Ideally, these objectives should be in measurable terms, such as quantity (how much or many), quality (how well), and time (how long). A major advantage of translating performance requirements into objectives is that objectives become a motivational tool or target for achievement (Morgan, 1982).

Agricultural extension workers are personnel who are responsible for meeting the goals of extension system. However, only little empirical literature exists on the roles and performance of extension workers in Nigeria. There are sporadic studies on criticism that extension was not being able to perform the necessary changes in the rural community (Sallam and Akram, 2005). Therefore, it is very critical to know the leadership competencies of extension workers and how these leadership competencies influence their performance.

Furthermore, in the context of agricultural extension, most international studies generally focus on evaluation of extension system and methodology rather than personnel. For example, economic evaluation of the performance extension system (Bindlish and Evenson, 1993), economic impact of extension system of agriculture extension (Brikkhaeuser, 1991) and measuring performance indicators of paid-extension system (Dinar and Keynan, 1998). There is rarely focusing on the aspects of extension workers’ leadership competencies and their performance. Davis and Verma (1993) asserted that studies concerning job performance evaluation in extension organisation contexts are still limited. Since personnel performance is regarded as an important element of extension organisation behavior, there is a strong necessity to determine further the relationships between the qualities of (extension worker as a) leader such as competencies in human development learning, leadership development, communication methods, extension program planning, extension program implementation, extension program evaluation, as well as organizational commitment and extension workers’ performance.

Globally, several studies in agricultural extension contexts focus on evaluating the effectiveness of extension organisations from economical prospective. For example Dinar et al. (2007) focused on assessing the impact of agriculture extension on farm production, farmers’ adoption rate of the new technology disseminated by extension workers.

In the Nigerian agricultural extension organisations there is a lack of proper and adequate understanding of the performance of extension personnel. An institutional analysis should assess the existing performance. There should be attention to performance of extension workers; mechanisms for improving work conditions; identification of competencies and the reinforcement of commitment towards extension profession and organisation. Investigating relationships of these variables with performance is useful in studying the phenomenon from ‘being person-oriented to being behavior oriented’ (Welbourne et al., 1997). McCaslin and Mwangi (1994) further emphasised that continuous and accurate staff evaluation is essential in improving agricultural extension workers’ performance and productivity. It was against this background that this study was undertaken to analyse the determinants of job performance of agricultural extension workers as a leader in Nigeria.

The broad objective of this study is to analyse the determinants of job performance of agricultural extension workers as a leader in Nigeria. The specific objectives of this study are to:
i. determine the level of job performance among extension workers in Nigeria;
ii. determine the relationship between performance of extension workers and leadership competencies and organisational commitment in Nigeria; and
iii. determine the predictors of job performance of agricultural extension workers in Nigeria.

The following null hypotheses were stated and tested:

i. there is no significant relationship between leadership competencies and job performance of agricultural extension workers in Nigeria;
ii. there is no significant relationship between organisational commitment and job performance of agricultural extension workers in Nigeria;
iii. selected explanatory variables have no significant influence on job performance of agricultural extension workers in Nigeria.

2. Review of Literature

2.1 Agricultural Extension as a Service to Community

The term agricultural extension is a professional communication intervention deployed by organisations to disseminate agricultural knowledge and technologies to rural communities. Extension has a long history, based on adult education, communication science, community development, rural development, international development, and has strong linkages with agricultural research and practice (Karbasioun et al., 2007).

According to Van den and Hawkin's (1996), agriculture extension is a public service for human resources development (HRD) of workers in agribusiness sector, including farmers. However, the function of agricultural extension is not only seen as vehicle for spreading scientific and technical progress and technology transfer. The agricultural extension, therefore, is a broader concept which emphasised implementation of projects, delivery of knowledge and information. The system is also an avenue for mutual interaction and opportunity that help people to develop solutions to their problems. Extension then is much related to a leadership function in the community. So, an extension worker is not simply seen as a technical innovation motivator, but is gone beyond a human resource development to a leader to help in institution building and mobilization of resources in the community.

2.2 Extension Worker as a Leader

Leadership is crucial in agricultural extension services. Interest in the concept of leadership has been steadily increasing among scholars, public and private organisations since late 20th century (Shriberg et al., 2005). There are as many definitions of the concept of leadership as there are authors on the subject of leadership. Bass (1990) indicated that there are almost as many different definitions of leadership as there are persons who have attempted to define the concept. Some of the authors have defined leadership as a position, a person, a behavioural act, a style, a relationship or a process. Thus, finding one specific definition of leadership is a very complex task as studies on the topic are wide and varied and there is no generally accepted definition (Bass, 1985).

Generally, leadership involves influencing other individuals to act towards the attainment of a goal or goals. In the 1950’s, Stogdill (1974) captured what is considered an accurate definition of leadership: “….the process of influencing the activities of an organised group in efforts towards goal setting and goal achievement” (Stogdill, 1974). This is in line with Dubrin (2007) who defined leadership as a process whereby an individual influences a group of individuals to achieve a common goal.

In the field of agricultural extension, leadership has critical strategic importance since it deals with developing groups of farmers in the community. Agricultural extension worker in this sense serves as an administrative leader and coordinator for formulating, developing, implementing and evaluating
agricultural extension programmes as well as develop farmers in managing resources in the rural areas. He guides the extension education activities for farmers as groups or individuals towards the purposeful pursuance of given objectives within a particular situation by means of extension communication methods.

Radhakrishna et al. (1994) emphasised that the leadership role of extension workers has become an increasingly critical element in the successful performance of extension programmes. Havelock (1973) identified four leadership functions of extension worker, namely, as a catalyst, solution giver, process helper and resource linker. This means that extension workers as leaders should raise the awareness of farmers, form functional farmers groups and make decision for solution together with farmers. Extension workers, who possess the desire to lead, may enhance their skills and abilities required for the leadership role that might influence their performance and success.

Furthermore, the importance of the leadership skills has become widely acknowledged as explanation of personnel and organisational performance in the various employment sectors. In the context of agricultural extension organisation, skilled extension workers are needed to coordinate human, capital and material resources required to accomplish the goals of agricultural extension services. So, leadership in extension context is indeed a social function which is necessary for the achievement of collective objectives. It can be said that the agricultural extension leadership within a rural community is not just a position in a hierarchy or a chain of commands in extension system, but it involves actions of the extension worker as a leader. It is a kind of mutual interaction between extension worker and farmers.

2.3 Conceptualization of Performance
The success of an extension services organisation is reliant on the extension leader’s ability to optimise human resources. A good extension worker as a leader understands the importance of individuals in achieving the goals of the extension services, and that motivating these farmers is of paramount importance in achieving these goals. It has been widely accepted that effective organisations require effective leadership and that organisational performance will suffer in direct proportion to the neglect of this (Dubrin, 2007). It is generally accepted that the effectiveness of any set of people is largely dependent on the quality of its leadership – effective leader behaviour facilitates the attainment of the follower’s desires, which then results in effective performance (Maritz, 1995).

2.4 Meaning of Performance
Performance is generally discussed within the contexts of leader behaviour, motivation, task design, goal setting, and most other primary areas of organisational research. For example, the term performance is widely used in all fields of management using terms such as performance management measurement (Armstrong, 2006) and evaluation or appraisal (Murphy and Cleveland, 1995). One of the pioneer researchers who conceptualized the term “performance” was Vroom (1964) who suggested an equation to picture performance and he narrated that it is a product of personal ‘ability’ and ‘motivation’ of an individual or performance = ability × motivation. Vroom’s model explains that an individual who is thought to be highly motivated would not be able to perform a job well if he does not possess relevant skills, knowledge and attitudes (KSAs). In other words, both ability and motivation are essential ingredients to good employee performance. The formula to determine performance as drawn above can be implemented at various fields such as a management, education, and organisational behaviour.
2.5 Leadership and Performance
The success of an extension services organisation is reliant on the extension leader’s ability to optimise human resources. A good extension worker as a leader understands the importance of farmers in achieving the goals of the extension services, and that motivating these farmers is of paramount importance in achieving these goals. It has been widely accepted that effective organisations require effective leadership and that organisational performance will suffer in direct proportion to the neglect of this (Dubrin, 2007). Furthermore, it is generally accepted that the effectiveness of any set of people is largely dependent on the quality of its leadership. Effective leader behaviour, therefore, facilitates the attainment of the follower’s desires, which then results in effective performance (Maritz, 1995).

2.6 Dimensions of Performance
K-State Cooperative Extension Service (2006) developed a performance appraisal model for extension workers. This model assumes that performance measurement of extension workers can be accomplished using the following dimensions: quality of work, quantity of work, dependability, work schedule, work allocation, poise and composure, organization and customer satisfaction. However, in order to establish the content dimensions of job performance, Viswesvaran (2001) suggests that a comprehensive specification of the content dimensions of the job performance constructs can be obtained by collating all the measures of job performance that have been used in the extant literature. In the light of the pervious performance measurement, models, roles, tasks and job descriptions of the Nigerian extension workers, therefore, and for the purpose of measuring the perception of extension workers’ performance, some of the aforementioned performance criteria were used in identifying the performance of extension workers and two dimensions were developed by the researchers based on the Nigerian setting. Further descriptions, of these dimensions are as follows:

Quality of work: Terziovski and Dean (1998) stated that improvement in work quality is likely to increase productivity, performance and profits; hence, quality of work is regarded as the most effective dimension affecting the employee’s performance. The performance measures for the quality of extension workers assess their ability to perform the objectives of extension programmes and outcomes set in the programmes.

Quantity of work: Quantity of work refers to completion of assigned work within the prescribed time limits.

Attendance at work: Attendance at work refers to the extension workers’ willingness to work on a timely basis, for example, no absence without good excuse and or reports for work late, attendance in terms of participation in extension training sessions and regular staying on the daily job.

Dependability: As indicated by K-State (2006), dependability emphasises the completion of assignment on time and with full commitment.

Feedback of extension activities: The feedback of extension activities as dimension of job performance can be operationally defined as the tasks that extension workers have to perform in order to accomplish successful feedback concerning strengths and weaknesses of carrying out extension activities.

Client’s satisfaction: Agricultural extension services, like other public sector services, have seen an increased emphasis on measuring quality of programmes through client satisfaction surveys (Radhakrishna, 2002). In agriculture extension contexts, however, client satisfaction refers to the way a customer feels about the agricultural extension programme on scales that range from very satisfactory to very dissatisfactory.

2.7 Leadership Competencies
Today’s agricultural extension organisations demand a challenging combination of individual talent and collective ability and effort. Extension workers as leaders to rural community must develop the right level of leadership competencies. Competencies have become a leading construct in human resource practices, such as recruitment and selection, career development, performance management, and the management of change (Heinsman et al., 2007).

The term competency is defined in the literature as behavioural characters that an individual needs to demonstrate. Boyatzis (1982) defines competency broadly as an underlying characteristics of a person. It could be motive, trait, and skill, aspect of one’s self image or social role, or body of knowledge which he uses. Seevers et al. (1997) reported that in 1993, the Personnel and Organization Committee of the Extension identified 16 core competency areas that all extension agents should possess. The core competency areas include: applied research, change management, communication and human relations, computer operation and software, conflict resolution, cooperative extension system, educational programming (programme development), evaluation and accountability, instructional development and learning, marketing and public relations, organisational development, personnel organisation and management, professional and career development, public policy education, human resource development and management, and strategic planning. These core competency variables were found useful in shaping the extension worker’s behaviour as a leader.

Moreover, the linkage between competency and job performance is addressed by Boyatzis (1982) in “model of effective job performance”. This model specifies that effective action, and therefore performance, will occur when all of the critical components namely organizational environment, job demands and an individual’s competencies are consistent or fit. According to this model, an individual’s competencies represent capability that an employee brings to the job situation as required by the job tasks. These job requirements can be considered as what the job demands on an individual. In agricultural extension work contexts, competencies refer to extension workers’ skills and knowledge (e.g. human development, leadership development, communication and programme development skills), which are necessary to successfully perform extension tasks. Thus, an extension worker who is aware, for example, of his or her ability to communicate or interact well with people of the rural community; plan, implement and evaluate extension programme, may use these skills in order to increase performance.

Nowadays, agricultural extension service is experiencing transition and rapid change. As a result, extension needs to address the necessary competencies that contribute to performance of its extension workers. Therefore, selecting leadership competencies as independent variables helps to understand the role it plays on the performance of agricultural extension workers. Boone (1990) asserted that extension organisations are replacing the notion of jobs with consideration of what competencies will be required for the 21st century. This trend has led to renewed interest in person, since the extension organisations is said to be an agency of change for problem solving, a catalyst for individual and group action (Havelock, 1973). Spencer and Spencer (1993) stated that competence “is an underling characteristic of an individual that is causally related to criterion-referenced effective or superior performance in a job situation”. This means that competence components for effective extension leadership have included a leader’s ability to encourage farmers, to provide support for subordinates, to plan well, to have knowledge of his organisation, to have personal communication skills to be able to solve the conflict among farmers. So, extension worker as a leader to farmers ought to be competent in certain skills and behaviours to be successful. Those skills and behaviours are termed essential behavioural leadership qualities (Oyinlade, 2006), and the assessment of leader’s performance should be based solely on these qualities.
2.8 Organisational Commitment
According to Stum (1999), employee commitment reflects the quality of the leadership in the organisation. Therefore it is logical to assume that leadership behaviour would have a significant relationship with the development of organisational commitment. Previous research suggests a positive direct relationship between leadership behaviour and organisational commitment. Transformational leadership is generally associated with desired organizational outcomes such as the willingness of followers to expend extra effort (Bass, 1985). A willingness to expend extra effort indicates some degree of commitment. Contingent reward behaviours that represent transactional leadership have been found to be reasonably associated with performance (Bass, 1990; Bass and Avolio, 1990).

The concept organisational commitment (OC) is useful in predicting employees’ behaviour such as job performance. The importance of investigating OC seems to be recognised widely (Mathieu and Zajac, 1990; Morrow, 1993; Meyer and Allen, 1997; Chen and Francesco, 2003; Awamleh, 1996). For example, Meyer and Allan (1997) emphasised the importance of studying organizational commitment. First organisations continue to exist in the world. Organisational commitment still plays a key role in an organisation’s development (Hsieh, 2000). Second, organisational commitment is the reason why organisations can compete with each other. For example, with high organisational commitment, employees in an organisation perform their jobs well. This organisation can retain highly quality employees its wants to keep. This organisation will be able to enhance its ability to compete with other organisations. This is especially important when an organisation spends an amount of money to train its employees to learn new skills, knowledge and abilities. Those employees will become highly valuable. So, if these employees do not have enough organisational commitment to continue with the organisation, the organisation will not only lose the ability to compete with other organisations, but also its investment in employee training. Third, commitment develops naturally. Shaw et al. (2003) stated that the employee needs to commit to something. When employee feels a low level of organisational commitment, the employee may change the organisations. In agricultural extension contexts a more serious threat is that an extension worker may leave the extension services in order to pursue another career.

According to Mowday et al. (1979), people who have a strong commitment display the following behaviours: (1) they strongly believe in and accept the organisation’s values and goals, (2) they are willing to exert effort on the organisation’s behalf, and (3) they have a strong desire to keep membership in the organisation which they work. Moreover, Meyer et al. (1989) stated that employees’ job performance is arguably as important as or more important than whether they ultimately stay or leave. Meyer et al. (1989) findings underscore the need for more research examining relationship between commitment and work related behaviour other than turnover.

3. Methodology
3.1 The Study Area
Benue State is one of the 36 states of Nigeria located in the North-Central part of Nigeria. The State has 23 Local Government Areas, and its Headquarters is Makurdi. Located between Longitudes 6° 35’E and 10° E and between Latitudes 6° 30’N and 8° 10’N, the State has abundant land estimated to be 5.09 million hectares. This represents 5.4 percent of the national land mass. Arable land in the State is estimated to be 3.8 million hectares (BENKAD, 1998). This State is predominantly rural with an estimated 75 percent of the population engaged in rain-fed subsistence agriculture. The state is made up of 413,159 farm families (BNARDA, 1998) and a population of 4,219,244 people (NPC, 2007). These farm families are mainly rural. Farming is the major occupation of Benue State indigenes. Popularly known as the “Food Basket” of the Nation, the State has a lot of land resources. For example cereal crops like rice, sorghum and millet are produced in abundance. Roots and tubers produced include yams,
cassava, cocoyam and sweet potato. Oil seed crops include pigeon pea, soybeans and groundnuts, while tree crops include citrus, mango, oil palm, guava, cashew, cocoa and *Avengia spp*.

### 3.2 Sampling Technique

Benue State is divided into three agricultural zones namely, Zone A, Zone B and Zone C. The target population for this study was the field extension workers that included the ZEOs, BESs, BEAs, and EAs in Benue State ADP (BNARDA).

Multi-stage random sampling procedure was used in the selection of the agricultural zones, blocks, and circles. The first stage involved sampling of the agricultural zones in Benue State: Zones A, B and C. The ZEOs whose zones were selected served as respondents. The second stage involved simple random selection of ten blocks from each of the agricultural zones. The BESs and BEAs working in these blocks served as respondents. The third stage involved simple random sampling of six circles from each of the blocks. The EAs whose circles were selected served as respondents. A total of two hundred and forty-three (243) respondents consisting of 3 ZEOs, 30 BESs, 30 BEAs and 180 EAs constituted the sample size for the study. However, two hundred and forty (240) questionnaires were found suitable for use in the analysis.

### 3.3 Data Collection

Data were collected mainly from primary sources. Primary data for the study were generated through the use of a structured questionnaire, copies of which were administered to the 243 respondents selected for the study.

### 3.4 Method of Data Analysis

Data collected were analysed using both description statistics and inferential statistics. Description statistics such as frequency distribution, percentages and means were used to analyse specific objective i. Inferential statistics such as correlation analysis was used to analyse specific objective ii, while binary logistic regression model was used to analyse specific objective iii. Hypothesis i and ii were tested using Spearman rank correlation while hypothesis iii was tested using binary logistic regression model.

### 3.5 Model Specification

#### 3.5.1 Variable Measurement

To assess the job performance of the field extension workers, each of the sampled EAs, BEAs and BESs was assessed by his/her immediate supervisor on a five point Likert-type scale. The five points on the scale were graded as follows: 1= Very Low, 2=Low, 3=Average, 4=High and 5=Very High job performance. The job performance indices or variables were derived from the respective performance requirements of these groups of respondents as reported by Benor and Baxter (1984), Ezeano (1996), Amalu (1998), Okarimia and Nwogu (2000) and Okpongete (2000). The ZEOs were asked to indicate the extent to which each of the different job performance statements or items or indices represent the performance level of each of the BESs under them. The BESs were asked to indicate the extent to which each of the different job performance statements or items or variables represent the level of performance of each of the EAs under their jurisdiction. The BESs were also asked to indicate the extent to which each
of the different job performance statements or items or indices represented the performance level of each of the BEAs working in their respective blocks. The mean performance score for each of the different job performance statements or items or variables for BESs, BEAs and EAs was calculated by dividing the total job performance score by the number of respondents, respectively. The job performance level for each group of respondents was computed by dividing the grand mean performance score by the number of the different job performance statements or items.

3.5.2 Spearman rank correlation

The Spearman correlation coefficient is defined as the Pearson correlation coefficient between the ranked variables (Myers and Well, 2003). For a sample of size $n$, the $n$ raw scores are converted to ranks $x_i, y_i$, and $\rho$ is computed from these:

$$\rho = \frac{\sum_i (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_i (x_i - \bar{x})^2 \sum_i (y_i - \bar{y})^2}}.$$ 

Tied values are assigned a rank equal to the average of their positions in the ascending order of the values. In applications where ties are known to be absent, a simpler procedure can be used to calculate $\rho$ (Myers and Well, 2003; Maritz, 1981). Differences $d_i = x_i - y_i$ between the ranks of each observation on the two variables are calculated, and $\rho$ is given by:

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}.$$ 

An alternative name for the Spearman rank correlation is the "grade correlation" (Yule and Kendall, 1950); in this, the "rank" of an observation is replaced by the "grade". In continuous distributions, the grade of an observation is, by convention, always one half less than the rank, and hence the grade and rank correlations are the same in this case. More generally, the "grade" of an observation is proportional to an estimate of the fraction of a population less than a given value, with the half-observation adjustment at observed values. Thus this corresponds to one possible treatment of tied ranks. While unusual, the term "grade correlation" is still in use (Piantadosi et al., 2007).

The sign of the Spearman correlation indicates the direction of association between $X$ (the independent variable) and $Y$ (the dependent variable). If $Y$ tends to increase when $X$ increases, the Spearman correlation coefficient is positive. If $Y$ tends to decrease when $X$ increases, the Spearman correlation coefficient is negative. A Spearman correlation of zero indicates that there is no tendency for $Y$ to either increase or decrease when $X$ increases. The Spearman correlation increases in magnitude as $X$ and $Y$ become closer to being perfect monotone functions of each other. When $X$ and $Y$ are perfectly monotonically related, the Spearman correlation coefficient becomes 1. A perfect monotone increasing relationship implies that for any two pairs of data values $X_i, Y_i$ and $X_j, Y_j$, that $X_i - X_j$ and $Y_i - Y_j$ always have the same sign. A perfect monotone decreasing relationship implies that these differences always have opposite signs.

The Spearman correlation coefficient is often described as being "nonparametric." This can have two meanings. First, the fact that a perfect Spearman correlation results when $X$ and $Y$ are related by any monotonic function can be contrasted with the Pearson correlation, which only gives a perfect value when $X$ and $Y$ are related by a linear function. The other sense in which the Spearman correlation is non-parametric is that its exact sampling distribution can be obtained without requiring knowledge (i.e., knowing the parameters) of the joint probability distribution of $X$ and $Y.$
3.5 2.1 Determining significance

One approach to testing whether an observed value of \( \rho \) is significantly different from zero (\( r \) will always maintain \( 1 \geq r \geq -1 \)) is to calculate the probability that it would be greater than or equal to the observed \( r \), given the null hypothesis, by using a permutation test. An advantage of this approach is that it automatically takes into account the number of tied data values there are in the sample, and the way they are treated in computing the rank correlation.

Another approach parallels the use of the Fisher transformation in the case of the Pearson product-moment correlation coefficient. That is, confidence intervals and hypothesis tests relating to the population value \( \rho \) can be carried out using the Fisher transformation:

\[
F(r) = \frac{1}{2} \ln \frac{1 + r}{1 - r} = \text{arctanh}(r).
\]

If \( F(r) \) is the Fisher transformation of \( r \), the sample Spearman rank correlation coefficient, and \( n \) is the sample size, then

\[
z = \sqrt{\frac{n - 3}{1.06}} F(r)
\]

is a z-score for \( r \) which approximately follows a standard normal distribution under the null hypothesis of statistical independence (\( \rho = 0 \)) (Choi, 1977; Fieller et al., 1957).

One can also test for significance using

\[
t = r \sqrt{\frac{n - 2}{1 - r^2}}
\]

which is distributed approximately as Student’s t distribution with \( n - 2 \) degrees of freedom under the null hypothesis (Press and Flannery, 1992). A justification for this result relies on a permutation argument (Kendall and Stuart, 1973).

A generalization of the Spearman coefficient is useful in the situation where there are three or more conditions, a number of subjects are all observed in each of them, and it is predicted that the observations will have a particular order. For example, a number of subjects might each be given three trials at the same task, and it is predicted that performance will improve from trial to trial. A test of the significance of the trend between conditions in this situation was developed by Page (Page, 1963) and is usually referred to as Page’s trend test for ordered alternatives.

In this study, the conceptualization by Vroom (1964) that performance is a product of personal ‘ability’ and ‘motivation’ of an individual or \( \text{performance} = \text{ability} \times \text{motivation} \) was used as a guide to investigate the relationships between the extension leadership competencies and extension worker’s job performance. Leadership competency variables in Extension work in this study comprises human development skills, leadership development skills, agriculture extension methods and communication skills, agriculture extension program planning skills, extension program implementation skills and extension program evaluation skills. Organisation commitment comprises: strong belief in and acceptance of the organisation’s values and goals, willingness to exert effort on the organisation’s behalf, and strong desire to keep membership in the organisation which they work. In order to seek the relationship between agricultural extension workers job performance and their Leadership competency and Organisation commitment, the Spearman correlation analysis was adopted. The variables were specified as follows:

\[Y = \text{Agricultural extension worker job performance}\]

\[X_1 = \text{Human development learning}\]

\[X_2 = \text{Leadership development}\]

\[X_3 = \text{Communication methods}\]
X_4 = Extension program planning  
X_5 = Extension program implementation  
X_6 = Extension program evaluation  
X_7 = Organisational commitment (strong belief in and acceptance of the organisation’s values and goals)  
X_8 = Organisational commitment (willingness to exert effort on the organisation’s behalf)  
X_9 = Organisational commitment (strong desire to keep membership in the organisation)  
Overall (LC) = Overall leadership competency  
Overall (OC) = Overall organisational commitment

The Spearman rank correlation coefficient $r$, can take any value between $-1$ and $+1$. A statistically significant correlation coefficient in the range $0 < r \leq 0.3$ will be regarded as week correlation; $0.3 < r \leq 0.6$ will be regarded as moderate correlation; $0.6 < r < 1$ will be regarded as strong correlation, while a correlation coefficient of $1$ will be regarded as perfect correlation.

3.5.3 Binary Logistic Regression Model

In the logistic regression model, the relationship between $Z$ and the probability of the event of interest is described by this link function.

$$
\pi_i = \frac{e^{zi}}{1 + e^{zi}} = \frac{1}{1 + e^{-zi}}
$$

or

$$
Z_i = \log(\frac{\pi_i}{1 - \pi_i})
$$

where

$\pi_i$ is the probability the $i$th case experiences the event of interest  
$Z_i$ is the value of the unobserved continuous variable for the $i$th case

The model also assumes that $Z$ is linearly related to the predictors.

$$
Z_i = b_0 + b_1x_{i1} + b_2x_{i2} + ... + b Px_{iP}
$$

where

$x_{ij}$ is the $j$th predictor for the $i$th case  
b$_j$ is the $j$th coefficient  
P is the number of predictors

If $Z$ were observable, one would simply fit a linear regression to $Z$ and be done. However, since $Z$ is unobserved, one must relate the predictors to the probability of interest by substituting for $Z$.

$$
\pi_i = \frac{1}{1 + e^{-(b_0 + b_1x_{i1} + b_2x_{i2} + ... + b Px_{iP})}}
$$

The regression coefficients are estimated through an iterative maximum likelihood method.

In this study it was assumed that ability (Vroom, 1964) which is defined as leadership competencies and organisational commitment (Allan and Myer, 1997) have joint effects on job performance of agricultural extension workers. In order to determine the predictors of job performance of agricultural extension workers in Benue State of Nigeria, the Binary Logistic Regression that was used is specified below:

$$
\log \frac{P}{1-P} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \mu
$$

where:

$$
\log P = \log \text{of the probability (P) of agricultural extension worker job performance ranking}
$$
$$1-P \quad \text{relative to non-performance ranking}$$

Where:

Performance = 1; \quad \text{Non-performance = 0}

Log = \text{logarithm to base 10}

$$\alpha = \text{Constant factor}$$

$$Y = \text{Agricultural extension worker job performance}$$

$$X_1 = \text{Human development competency}$$

$$X_2 = \text{Leadership development competency}$$

$$X_3 = \text{Communication competency}$$

$$X_4 = \text{Extension program planning competency}$$

$$X_5 = \text{Programme implementation competency}$$

$$X_6 = \text{Programme evaluation competency}$$

$$X_7 = \text{Organisational commitment}$$

$$\beta_i (i=1, 2, 3, 4, 5, 6, 7) \quad \text{are estimates of the coefficients}$$

$$\mu = \text{an error term measuring variation in extension worker performance unaccounted for by the independent variables}$$

Agricultural extension worker job performance was measured on 5-point scale based on the performance dimensions as follows: Very low performance = 1; Low performance = 2; Moderate performance = 3; High performance = 4; Very high performance = 5. Non-performance was however scored zero (0).

Mean score of between 1.00 and 2.35 was regarded as low performance; mean score of between 2.36 and 3.65 was regarded as moderate performance; mean score of between 3.66 and 5.00 was regarded as high performance.

The estimates of the coefficients $$\beta_i$$ were estimates of the effect of the variables on changes in extension worker job performance. A positive $$\beta_i$$ was found for variables associated with increased extension worker job performance and negative $$\beta_i$$ was found for variables associated with decreased extension worker job performance. Failure to reject the joint hypothesis that the estimates of the coefficients are jointly equal to zero, suggests that the change in extension worker job performance cannot be explained by variation in the independent variables.

4. Results and Discussion

4.1 Level of Job Performance of Agricultural Extension Workers in the Study Area

The result of the job performance of agricultural extension workers in Benue State is presented in Table 1. The result shows overall job performance of respondents in descending order from low to high. The result indicates that the overall mean score ($$M$$) was 2.67 and standard deviation ($$SD$$) was 0.58. While more than a half (60%) of the agricultural extension workers had a moderate level of job performance, 25% of them had a low level of performance and 15% had a high level of performance. The levels of agricultural extension workers’ performance for each component of performance dimension are presented in Table 1.

4.2 Relationship between Leadership Competency and Job Performance

The result in Table 2 shows that at 1% level of significance, the hypothesis ($$H_0$$) that there is no significant relationship between agricultural extension workers job performance and leadership competency is rejected. This suggests that there is a significant positive relationship between agricultural extension workers job performance and leadership competency in the study area. This implies that
agricultural extension workers job performance in the study area increases with increase in their leadership competency and vice versa.

The leadership competency variables are competencies in extension program implementation \((r = 0.61)\), program planning \((r = 0.66)\), program evaluation \((r = 0.59)\), leadership development \((r = 0.53)\), communication methods \((r = 0.51)\), and human development learning \((r = 0.53)\). This means that all the components have equal strengths in determining the relationship between performance and components of leadership competencies. Overall, leadership competencies \((r = 0.65)\) had a moderately positive and significant relationship with extension worker’s performance. This results support the recent study by Ahlam (2001) in her study regarding competencies needed for effective extension workers in Egypt which confirmed that there is a relationship between performance of agricultural extension workers and the competency in developing agricultural extension programmes at the community level.

Table 1: Level of Job Performance of Agricultural Extension Workers in Nigeria

<table>
<thead>
<tr>
<th>Performance Dimensions</th>
<th>Level</th>
<th>Mean Score</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>Low</td>
<td>1.00-2.35</td>
<td>85</td>
<td>35.42</td>
<td>2.62</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>2.36-3.65</td>
<td>106</td>
<td>44.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.66-5.00</td>
<td>49</td>
<td>20.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity</td>
<td>Low</td>
<td>1.00-2.35</td>
<td>137</td>
<td>57.08</td>
<td>2.18</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>2.36-3.65</td>
<td>71</td>
<td>29.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.66-5.00</td>
<td>32</td>
<td>13.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependability</td>
<td>Low</td>
<td>1.00-2.35</td>
<td>20</td>
<td>8.33</td>
<td>3.21</td>
<td>0.56</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>2.36-3.65</td>
<td>132</td>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.66-5.00</td>
<td>88</td>
<td>36.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback</td>
<td>Low</td>
<td>1.00-2.35</td>
<td>57</td>
<td>23.75</td>
<td>2.91</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>2.36-3.65</td>
<td>120</td>
<td>50.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.66-5.00</td>
<td>63</td>
<td>26.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attendance</td>
<td>Low</td>
<td>1.00-2.35</td>
<td>118</td>
<td>49.17</td>
<td>2.31</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>2.36-3.65</td>
<td>90</td>
<td>37.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.66-5.00</td>
<td>32</td>
<td>13.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmer satisfaction</td>
<td>Low</td>
<td>1.00-2.35</td>
<td>48</td>
<td>20.00</td>
<td>2.76</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>2.36-3.65</td>
<td>153</td>
<td>63.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.66-5.00</td>
<td>39</td>
<td>16.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall performance</td>
<td>Low</td>
<td>1.00-2.35</td>
<td>60</td>
<td>25.00</td>
<td>2.67</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>2.36-3.65</td>
<td>144</td>
<td>60.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.66-5.00</td>
<td>36</td>
<td>15.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Minimum Mean = 1; Maximum Mean = 5

Furthermore, Linder (2001) conducted a correlation study to examine the relationship between human resource competency and work performance and found that the correlation between the competency and work performance was strong and significant. New (1996) also pointed out that job competency was an aspect of activities in a particular role or positions which was associated with effective work performance. This shows that competency leads to confidence of the agricultural extension...
workers to have control over their work and, hence, flexibility and creativity to achieve a remarkable performance.

The implication of the foregoing findings is that extension workers are successful because they acquired competency in one or more occupational fields that help them to perform their job tasks well. The conclusion that can be drawn from this statement is that competency is a bunch of behavioural characters related to job performance. Therefore, agricultural extension work competency remains one of the important variables to use in order to explain the performance of agriculture extension workers. The highly significant correlation coefficient value suggests that there is a strong positive relationship between extension work competency and job performance. Consequently, work competency could potentially be used to integrate and link an organisation’s main human resource process such as extension performance management, training and development sessions’ workshop, extension and rural career development, succession planning and rewards to the agricultural extension and rural development strategy.

It can therefore be concluded that leadership competency is a tool that can help agricultural extension organisation to focus on developing the human capital. Absolutely, when leadership competency are used within an organization, they can serve as a road map to human resource practices and encourage organisation to identify competency gaps in order to improve extension workers’ job performance.

Table 2: Correlation Coefficients Matrix of Relationship between Performance of Agricultural Extension Workers and Leadership Competencies and Organisational Commitment in Nigeria

<table>
<thead>
<tr>
<th>Variables</th>
<th>Y</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
<th>X5</th>
<th>X6</th>
<th>Overall (LC)</th>
<th>X7</th>
<th>X8</th>
<th>X9</th>
<th>Overall (OC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X1</td>
<td>0.53*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>X2</td>
<td>0.53*</td>
<td>0.64</td>
<td>1.00</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X3</td>
<td>0.51*</td>
<td>0.62</td>
<td>0.64</td>
<td>1.00</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>X4</td>
<td>0.66*</td>
<td>0.62</td>
<td>0.63</td>
<td>0.75</td>
<td>1.00</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>X5</td>
<td>0.61*</td>
<td>0.59</td>
<td>0.67</td>
<td>0.71</td>
<td>0.66</td>
<td>1.00</td>
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</tr>
<tr>
<td>X6</td>
<td>0.59*</td>
<td>0.61</td>
<td>0.58</td>
<td>0.66</td>
<td>0.75</td>
<td>0.63</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>0.65*</td>
<td>0.79</td>
<td>0.82</td>
<td>0.88</td>
<td>0.87</td>
<td>0.84</td>
<td>0.83</td>
<td>1.00</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>LC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X7</td>
<td>0.31*</td>
<td>0.03</td>
<td>0.04</td>
<td>0.01</td>
<td>0.07</td>
<td>0.05</td>
<td>0.06</td>
<td>0.02</td>
<td>1.00</td>
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<tr>
<td>X8</td>
<td>0.47*</td>
<td>0.88</td>
<td>0.70</td>
<td>0.79</td>
<td>0.20</td>
<td>0.84</td>
<td>0.62</td>
<td>0.38</td>
<td>0.28</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X9</td>
<td>0.57*</td>
<td>0.60</td>
<td>0.38</td>
<td>0.70</td>
<td>0.29</td>
<td>0.73</td>
<td>0.55</td>
<td>0.30</td>
<td>0.40</td>
<td>0.37</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>0.69*</td>
<td>0.73</td>
<td>0.85</td>
<td>0.76</td>
<td>0.89</td>
<td>0.82</td>
<td>0.87</td>
<td>0.65</td>
<td>0.59</td>
<td>0.43</td>
<td>0.68</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Correlation coefficient (r) is significant at 5% level (2-tailed).

4.3 Relationship between Organisational Commitment and Job Performance

The result in Table 2 shows that at 1% level of significance, the hypothesis (Ho2) that there is no significant relationship between agricultural extension workers job performance and organizational commitment is rejected. This suggests that there is a significant positive relationship between agricultural extension workers job performance and organizational commitment in the study area. This implies that agricultural extension workers job performance in the study area increases with increase in their organizational commitment and vice versa.
The result shows that organisational commitment ($r = 0.69$) had a moderately positive and significant relationship with agricultural extension workers job performance. Empirically, this result supported the study of Subramaniam (2000) who found a positive relationship between commitment and job performance in Japanese multinational company in Malaysia.

In their classic study regarding measurement of organisational commitment, Mowday, et al. (1979) identified a low and significant relationship between organisational commitment and performance. The findings were also consistent with past studies that have been conducted by Shaw, et al. (2003); Chen and Francesco, (2003); Yousef, (2000); and Suliman and Iles (2000). The results suggested that organisational commitment and job performance are positively correlated.

It can therefore be logically inferred that organisational commitment was significantly related to the performance of extension workers in the country. The implication is that extension workers seemed to demonstrate higher performance to the agriculture extension profession when encouraged with organisational commitment.

4.4 Predictors of Job Performance of Agricultural Extension Workers in the Study Area

The result of the binary logistic regression in Table 3 shows that at 5% level of significance, the hypothesis ($H_0$) that human development competency, leadership development competency, communication competency, extension program planning competency, programme implementation competency, programme evaluation competency and organisational commitment have no significant influence on agricultural extension workers job performance is rejected. There was a significant change in $-2 \log$-likelihood. This suggests that there was a significant cause-effect relationship between agricultural extension workers job performance and the selected explanatory variables. The Cox & Snell R square (coefficient of determination) ($R^2$) is 0.583. This indicates that 58.3% variation in agricultural extension workers job performance is accounted for by variations in the selected explanatory variables, suggesting that the model has explanatory power on the changes in agricultural extension workers job performance. The Nagelkerke R square (adjusted $R^2$) also supported the claim with a value of 0.759 or 75.9%. This implies that the selected explanatory variables explain the behavior of agricultural extension workers job performance at 76% level of confidence.
The result of the predictors of job performance of agricultural extension workers among the respondents is presented in Table 3. The result shows that the probability of agricultural extension workers job performance increases with increase in human development competency. This is because improvement in human development competency is expected to enable agricultural extension workers develop a satisfactory leadership competency, which positively impact on their job performance.

The result also shows that the probability of agricultural extension workers job performance increases with increase in leadership development competency. This is because improvement in leadership development competency is expected to enable agricultural extension workers develop a better leadership quality, which positively impact on their job performance.

The result further shows that communication competency has a significant and positive influence on agricultural extension workers job performance. This suggests that agricultural extension workers job performance becomes better as their communication competency increases. It can be inferred from this that agricultural extension workers often use communication methods that they perceive is useful to increase their expected job performance. The implication of this is that ability to use appropriate communication methods is a critical factor that imparts on the agricultural extension workers the capacity to perform well in their agricultural extension work.

The probability of agricultural extension workers job performance is shown to increase with increase in extension program planning competency. This suggests that extension program planning competency raises agricultural extension workers’ knowledge and understanding of the task ahead and leads them to make more accurate impact on their subjects and hence better job performance in their agricultural extension work.
Programme implementation competency has a significant and positive influence on agricultural extension workers job performance. This suggests that agricultural extension workers job performance becomes better as their programme implementation competency increases. This is because increase in programme implementation competency of agricultural extension workers implies ability to carry out the appropriate tasks more accurately, which could serve as a driving force to improving performance in their agricultural extension work.

Programme evaluation competency has a significant and positive influence on agricultural extension workers job performance. Programme evaluation competency implies ability to ensure that tasks are performed in line with programmes goals and objectives, and that expected outputs are realised. Increase in such competency is likely to impart on the agricultural extension workers the increased capacity to achieve their targets in their agricultural extension work, and hence obtain a much better job performance.

The result in Table 3 also shows that organisational commitment has a significant and positive influence on agricultural extension workers job performance. This suggests that agricultural extension workers job performance becomes better as their organisational commitment increases.

The foregoing findings support the positive contribution of leadership competency and organisational commitment to job performance. Past research results support this finding. For example, Steel and Scotter (2003) and Ashton (1996) found that competency was an effective predictor of job performance. The finding is also consistent with Nikolaou (2003) who found that work competency seemed to have a strong impact on job performance.

Regarding organisational commitment, Meyer et al. (1989) found that the organisational commitment dimensions namely acceptance and continuance contributed significantly to the prediction of job performance. The implication is that the value of commitment to the agricultural extension organisations, therefore, may depend on the nature of commitment. When commitment reflects an identification with and involvement in, extension organisation may benefit both in terms of reduced intention to leave the agricultural extension profession and increased performance. However, when commitment is primarily on the basis of recognition of the costs associated with leaving, the benefits of minimizing intention to leave the job may be obtained at the price of relatively poor performance. As a result, it is important for agricultural extension organisations to examine the policies they implement to improve extension workers’ commitment towards their job and extension organisations.

5. Conclusion and Recommendation
The study showed that leadership competency and organizational commitment is a bunch of behavioural characters related to agricultural extension workers job performance. The study showed a positive contribution of leadership competency and organisational commitment to job performance. A good performance of agricultural extension workers can be achieved through appropriate agricultural extension policies and strategies that are tailored towards improving leadership competency of agricultural extension workers and enhancing their organisational commitment. It is recommended that in order to improve the performance of agricultural extension workers, it should be taken into account the status of extension workers specifically on their competency skills and job commitment to work with the rural communities.
References


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