

## **The Influence of Agricultural Development Project (ADP) on the Living Standard of Rural Farmers in North Central Nigeria**

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**Abstract:** *The study sought to ascertain the influence of Agricultural Development Project (ADP) on the living standard of rural farmers in North Central Nigeria. The specific objectives were to identify the: teaching methods used by ADP extension agents for effective teaching of farm technologies to enhance the living standard of rural farmer, rural farmers' constraints in successful participation in the ADP project, extent to which rural farmers' adoption of improved farm technologies/practices helped to influence their living standard, extent to which provision of infrastructural facilities to rural farmers influence their standard of living and influence of ADP on the living standard of rural farmers. In line with these objectives, five research questions were answered and five hypotheses tested at 0.05 level of significance. The study adopted survey research design. The population of the study was 223. The instrument was validated by five experts. The reliability of the instrument was established using Cronbach alpha method and the reliability coefficients obtained were 0.86, 0.83, 0.72, 0.73 and 0.77 for sections A, B, C, D and E respectively. The overall reliability was therefore 0.78 indicating that the instrument is high in internal consistency and hence reliable for use in the study. Data was collected by the researcher and five research assistants. 217 copies representing 97% of the instrument were retrieved and analyzed using mean and standard deviation for research questions and t-test for testing hypotheses. It was found from the study that there are 18 teaching methods used by ADP extension agents, the study also revealed that there are 29 constraints to the rural farmers' successful participation in the ADP project. Adoption of improved farming practices by farmers as learnt from the ADP extension agents has influenced their standard of living to a very high extent, ADP's Provision of infrastructure to rural farmers has influenced their living standard to a very high extent and that there are 28 ways Agricultural Development Project influence the living standard of rural farmers. It was also found that there is no significant difference between the mean response of farmers and extension agents in the five hypotheses tested for the study at 0.05 level of significance. It was further concluded that despite the 29 challenges constraining farmers participation in the project, (ADP) has to a very high extent influenced the living standard of the rural contact farmers. Based on findings of this study, it was recommended among others that; Government through her ministry of agriculture and rural development should collaborate with the ADP extension agents in order to solve the problems constraining farmers' participation in Agricultural development projects by provision of fund and favorable policy initiatives and that ADP extension agents should continue to improve farmers' production practices through their various services as it has been established that it influences their standard of living.*

**Keywords:** *Agricultural Development, living standard, rural farmers, extension agents.*

## 1.0

## INTRODUCTION

### 1.1 Background of the Study

In many developing countries today, there is a growing need for rapid rural development in which Agricultural Development is increasingly utilized to be an essential component that enhanced rural farmers' living standard. According to World Bank Group (2014) Rural Farmers are those involved in farming and carrying out other related activities in the villages. They may cultivate food crops, mono crop, and rear livestock, engage in fishing and hunting among others, but they depend on seasonal and natural conditions to carry on their farming activities. Majority of communities in Nigeria are rural dwellers and agrarian by occupation. Development strategy for a country whose rural population are mainly rural farmers cannot be achieved without first sustained growth in rural income and standard of living primarily from agriculture. It was based on this that the state wide Agricultural Development Project (ADP) was designed and established by the Federal Government to influence rural farmers' participation in farming.

The concept of Agricultural Development Projects (ADPs) evolved from the desire of the Federal Government to throw its might behind the states government's efforts in the development of agricultural projects. This desire was reflected in the third National Development plan in which it was recognized that rapid economic development cannot be achieved within defective institutional framework (Madukwe, 2015). Evbuomwan (2017), outlined the activities of ADPs in Nigeria that has influenced rural farming to include, conducting worthwhile trainings on improved agricultural technologies, provision of rural infrastructure such as portable rural roads, construction of dams and boreholes for water supply. Others include supply of farm inputs such as fertilizers, herbicides, Planters, harvesters, processing machines and other agro-chemicals through farm services centres to enhance the technical and economic efficiency of small farmers in general. Naswem & Ejembi (2017) emphasis further that ADP also helped in the improvement of extension staff and farmers' training, introduction of new credit and marketing services and Provision of improved seeds. Osuntogun *et al.* (2014), stressed that ADP generate modern farming technologies in conjunction with relevant agricultural research institutes, disseminate improved agricultural technologies to contact farmers through effective extension delivery and linking farmers to sources of fund (soft-loan grants) and to educate farmers on how to get better market for their produce.

Omonijo *et al.* (2014), pointed out the methods used by ADP extension agent to influence rural farmers' adoption of farm technologies in the crop sub-sector to include the employment of On-farm Adaptive Research (OFAR) and Small Plot Adoption Technique (SPAT). These were achieved under the umbrella of the Training and visit (T & V) system of extension with contact farmers as the centre piece of all extension actions. Hanson and Just (2014) identified training and visit as yet another effective method of communicating the farmers by the Extension agents. They said that visitation enables the extension worker get acquainted with a villager. Target farm families or farm groups (contact farmers) were visited on fixed schedules. Obibuaku (2016), also noted that demonstration method was used to present an improved practice in an interestingly convincing way and which makes rural contact farmers understood the need for it and its practical

application to their situation. Demonstration teaches skills, stimulates and motivates action and builds confidence in the extension worker.

Ukaegbu (2015), reported that lack of capital limits the farmers' ability to utilize fertilizer and insecticides with which to improve their yields. Oyaide (2016), contended that farm credit is a necessary input for structural transformation and expansion in size-scale relationship in rural primary education. He said that inadequate farm credit prevents the adoption of innovation because farmer cannot with their low income, finance such practice as hiring labour and storage. This problem of lack of credit, according to Agbamu (2015), leads to seeds, fertilizers, vaccines, implements and insecticides not readily available to farmers in most of the developing countries and affects their rate of adoption of innovations.

The Agricultural Development Project of Nigeria is made up of Seven (7) sub-projects. The project is made up-of; (a) Project management and finance, (b) Administration and training, (c) Engineering services, (d) Technical services, (e) Agricultural Extension Services. (f) Rural institution development planning, (g) monitoring and evaluation (BNADP, 2015). The continuous increase in the demand for agricultural products by an enlarged populace has put the rural farmer in such a position where he needs the knowledge of modern farm technologies through the ADP and its extension services. Since the majority of the farmers in rural areas are illiterates and use primitive and less productive technologies in farming, they need an agency which will disseminate such information about the new farming technologies from research station. Such an agency is the Agricultural Development Project (ADP) which forms a link between the rural farmers and the research institutes and which this study sought to find its influence on rural farmers.

## **1. 2 Statement of the Problem**

Over the years, several farmers had practiced agriculture using crude implements and local farming system inherited from ancestors. These methods of farming did not result to increased production or profitability from sale of farm produce. The researcher further observed that in the study area (north central Nigeria), rural farmers have experienced decline in production of farm produce. Further investigation by the researcher as to the cause of continuous decline in production of basic food crops such as maize, rice and yams revealed that farmers had no access to basic training on improved agricultural technologies and farm inputs. The neglect of the agricultural sector in favor of the oil sector and the nature of the agricultural system had severe impact on the living standard of rural farmers. It was this poor condition of the rural areas that led to initiation of several agricultural policies and programmes to revamp the sector. It was expected that the activities of the ADP would contribute to the farmers' agricultural productivity and raise the living conditions of the farmer in the country. Available \data on Nigeria shows that poverty which is as a result of peasant farming in Nigeria is on the increase in the urban and rural sectors. Federal Office of Statistics (FOS, 2011) and "calls to question the effectiveness of government agricultural policies and programmes such as the ADP. It has also been asserted that traditional extension service, financed and provided by the state may have failed to meet their objectives of improving farmers' welfare and in some cases may have little or no influence. It is therefore necessary to ascertain the influence of ADP on rural farmers' living standard in North Central States of Nigeria.

### **1.3 Purpose of the Study**

The purpose of this study is to determine the influence of Agricultural Development Project (ADP) on the living standard of rural farmers' in North Central Nigeria. Specifically the study sought to:

- i. Identify teaching methods used by ADP extension agents for effective teaching of farm technologies to enhance the living standard of rural farmers.
- ii. Identify rural farmers' constraints in successful participation in the ADP project.
- iii. Ascertain the extent to which rural farmers' adoption of improved farm technologies helped to influence living standard of rural farmers.
- iv. Ascertain the extent to which provision of infrastructural facilities to rural farmers influence standard of living
- v. Determine the influence of ADP on the living standards of rural farmers.

The significance of this study is far-reaching in several dimensions to the various levels of government ranging from; Federal, State and Local, Non-Governmental organizations, extension officers and rural farmers. International organizations concerned with the rural development will find information generated by this study useful to them. Professional personnel in other life sectors such as health, Education and industry will also benefit from the information generated by this study. The study focused on the influence of Agricultural Development Project (ADP) activities on the living standard of rural farmers in North central Nigeria comprising of Benue, Kogi, Nasarawa, Kwara, Niger, Plateau states and FCT Abuja.

## **2.0 LITERATURE REVIEW**

### **2.1. Theoretical Framework of the Study.**

The theoretical frame work of this study was anchored on hierarchy of effect theory.

#### **2.1.2 The Hierarchy of Effects theory**

The hierarchy-of-effects theory is a marketing paradigm that explains how advertising influences consumer decisions to buy or not to buy an item or service. The hierarchy depicts the consumer's journey from learning and decision-making through advertisements. A hierarchy-of-effects model is utilized to establish a structured series of adverting message objectives for a specific product in order to achieve the desired result: sale. The hierarchy of effects is therefore applicable to this study because it explains how ADP introduction of new farm technologies affects the decision-making of target audiences when it comes to adoption of improved farm technologies by the rural framers to enhance more farm production and raise rural farmers' economic status. The concept was developed by Gary Steiner and Robert Lavidge (2014), in the early 1960s. The hierarchy of effect approach was adopted by ADP through agricultural extension agents by making concerted efforts of convincing and prompting rural farmers to adopt the new improved farm technology instead of the traditional farming methods inherited from their forefathers. The hierarchy-of-effects theory is a more sophisticated form of marketing that uses well-developed, persuasive advertising messages to create brand awareness over time in order to sell a product .The hierarchy-of-effects theory holds that people's attitudes, values, and behaviors are determined by three levels of cause and effect: cognitive, affective, and psychomotor domains. The hierarchy of effects theory considers a series of steps from gaining consumers' attention to their ultimate purchasing behavior by advertisers.

## 2.2. Conceptual Frame Work

### 2.2.1 Concept of Teaching Methods by ADP that Influence Living Standard of Rural Farmers

Agricultural Extension Services must essentially involve education and communication of technical information to rural farmers. For rural farmers to change, their traditional unproductive pattern of agricultural production, must acquire the necessary knowledge, attitude and skills. These are expected to enable them become more productive and grow individually. Uwaka (2015), indicated that to adopt and successfully use improved technique rural farmers must understand the -scientific complex knowledge. The understanding of this scientific complex knowledge may require effective teaching by the extension service. Williams (2016), stressed that an essential function of the extension workers is to create situations in which others learn. According to him, learning must be an active process, where the learning will accomplish nothing unless he puts forth both physical and mental effort. He further observed that learning takes place when a variety of activities are involved, such as seeing, discussing, feeling and acting. To this end therefore, Extension service will require many methods and teaching tools as people are influenced to make changes in behavior in proportion to degree of contact with several methods. The methods of disseminating new ideas and techniques' to farmers by Agricultural extension agents include; Demonstration. As pointed out by Omonijo *et al.* (2014), strategies for achieving/ implementing the ADP objectives in the crop sub-sector are usually the employment of On-farm Adaptive Research (OFAR) and Small Plot Adoption Technique (SPAT). These are achieved under the umbrella of the Participatory Extension Approach (PPEA) with contact farmers as the centre piece of all extension actions. A contact farmer (male or female) is a progressive and receptive farmer trained by the village Extension Agents (VEA) on the new practices and through whom information is communicated to other rural farmers within the rural communities.

### 2.2.2 Constrains of the ADP System in Nigeria

According to World Bank Group (2014), rural farmers are those involve in farming and carrying out other related farming activities in the villages. The primary occupation for rural people is agriculture and animal husbandry. They may cultivate food crops, mono crops, and rear livestock, engage in fishing and hunting among others, but they depend on sectional and natural condition to carry on their farming activities. In rural areas people live further away from each other because of their quest to acquire more farm land for agricultural purposes and this sometimes lead to constant communal land crises. The achievements of the ADP system on the rural economy in the last two decades of its existence may have been limited by the following, among others. Prior to the inception of the Agricultural Development Project (ADPs) in Nigeria, the constraints militating against enhanced production and productivity on the part of the small holder farmers had been identified as little access to credit, lack of improved technology and access to improved inputs, among others (Fadayomi, 2013). Consequently, it was felt that no meaningful increase in production and incomes by the rural farmers could be attained without adequate government intervention by way of improved services to the rural sector of the economy. A project approach was therefore though imperative in order to create the environment for production, and as the quickest means of addressing the set of constraints faced by the smallholder farmers. This formed the basis for the ADP strategy in Nigeria (Onemolease, 2017).

### **2.2.3 Rural Farmers' Adoption of Farm Technologies that Influenced Rural Farmers Living Standard**

Development as previously stated in this study is about people. Highlighted fruits of adoption of modern farming practices include better nutrition, lower death rates, a broader consumption basket, improved productivity, rising incomes and enhanced quality of life. There are several performance indicators to assess rural community development or the effectiveness of adoption of modern farming practice. A number of them are discussed below: Pinstrup and Pandya (2014), associated significant improvement in living standards in ADP enclave areas to increase in crop production. Kwa (2013), reported that maize production doubled from 237 million tons in 1985 to 460 million tons in 1991 in ADP enclave areas. Kwa (2013), used this parameter as a performance indicator, when he reported that the adoption of improved seed variety especially maize has been high in most ADPs. Adoption rose from 15% in 1980 to about 40% in 1990. For cassava, the adoption rates are estimated to be as high as 60% - 70% in some states. Fertilizer adoption in ADPs has grown exponentially from 28% in the 1980's to over 70% in 1990. The high rate of adoption was due to intensive extension activity, high rates of subsidization profitability and availability of fertilizer to farmers. Kwa (2013) reported that in general agricultural extension was carried out with 50% of achievement by reaching 1:700 extension worker to farmer ratio compared to pre-project value of over 1:1,500.

### **2.2.4 Extent of ADP Provision of Infrastructural Facilities that Influence Rural Farmers' Living Standard**

Akpobo (2017), stated that the ADP approach was said to have been originally designed in Malawi, East Africa, to tackle the problem of poverty. The above concept was transferred to Nigeria in 1974 and as explained by Auta and Dafwang (2016), the Nigerian government and the World Bank went into bilateral talk which resulted into the introduction of the Agricultural Development Projects (ADPs) in Nigeria in 1975. The first generation of ADPs started as enclave projects which covered few local government areas in three states in 1975 with the establishment of the first three enclave projects in the Northern part of the country. This includes: Funtua, Gusau and Gombe Agricultural Development Projects (Idrisa, *et al.*, 2014). Distinctive feature of the ADPs is the development of rural infrastructures closely related to agricultural and rural development vis a vis contribution to rural livelihood and food security in Nigeria. These include the construction of all-weather rural roads, dams, farm service centres and rural water supply. The achievements of the ADPs in the area of rural infrastructure have been very outstanding especially with respect to feeder roads. According to Kwa (2013), most ADPs exceeded their targets on road construction and maintenance. Onemolease (2017), reported that feeder roads rehabilitation and maintenance growing at an annual rate of 9.4% moved from annual average of 2394km in 1986 to 2.956km in 1989. Also, between 1975 and 1989 significant achievements were also recorded in the area of construction of dams, wells, boreholes, farm service centres and Fadama development

### **2.2.5. Influence of ADP on Rural Farmers Standard of Living**

The ultimate objective of the ADP system is to raise productivity, increase farm output, income and standard of living of the rural farmers. Therefore, the impact of the achievements of the ADPs on the farmers can only be measured in such terms. Oyaide (2016), reported that in 1985 about 9 million tonnes grain equivalent, representing 44% total food production that year was produced



by farmers involved in the project. He further noted that the contribution of ADP farmers to the national food basket is believed to have reached 60% now that the entire country is covered in the project. Of the 9 million tons produced in 1985, 3.4 tonnes was incremental output which when valued at 1985 prices (N350/tonne). The bottom-line of the influence of increased productivity and output is however, that farmers' income and welfare is improved. According to Kwa (2013), the average income per hectare from various crops and returns to family labour per man day for most crops were over 200% above pre-project situations in most completed ADPs. This was a significant achievement notwithstanding the impact of inflation. This rise in income, he noted, was translated into improved standard of living of the rural dwellers. The improved living standard manifested in rising proportion of rural households owning items like motorcycles, bicycles and radios. There was also increased proportion of households that obtained adult education, engaged in tradition as secondary occupation and enjoyed better health conditions.

Ezeh (2016), states that one Naira (N1.00) investment on improved planting materials/seeds by the ADP given to farmers under SPAT has generated a N2.80 revenue to "Contact farmers" and N1.80 to the non ADP contact farmers and that the SPAT system of technology transfer to small holder farmers has made some noticeable and quantifiable impacts in terms of its multiplier effects on the income of the farmers. Kalu (2016), stated that ADP has improved the quality of life and economic wellbeing of the people living in relatively isolated and sparsely populated areas. It is about reduction of poverty, increasing productivity, providing basic services like health, education, drinking water, sanitation, extending infrastructure etc. Davidson & Ahmad (2016), observe that an affective poverty reduction strategy must attack poverty on all fronts at the same time, he stressed that one of the key ways in which ADPs are different from previous agricultural development programmes is that they rely on a holistic view of the social and economic challenges facing farmers and offer a multi-pronged approach to attacking poverty.

Kalu (2016) further stated that rural development physically transforms a backward community to stages represented by symbolic presence of structures such as modern buildings or town halls, schools, hospitals, roads, bridges, pipe borne water and electricity. In this sense, rural development can be seen as an attempt aimed at creating the external manifestation of an ideal society in form of large scale modern programmes and projects. Obasi (2015), stated therefore that rural development encompasses the entirety of rural life including the economic, political, social, and cultural development of the rural people. Irz, *et al.* (2014), identify effects of ADP on agricultural growth on farm economy, rural economy and national economy. The effect on farm economy is achieved through higher incomes for farmers, including small holders who constitute a large share of the rural poor, especially in north central Nigeria.

### **2.3 Review of Related Empirical Studies**

Olujenyo (2016), investigated the "influence of ADP on the quality of social existence of rural dwellers in developing economies in Ondo state (Nigeria)". The purpose of the study was to examine the extent to which the implementation of the ADP had influence the rural farmers in Ondo state of Nigeria. A survey design was employed and structured questionnaires served as the research instrument. The research instrument was used to ascertain the perception of 288 respondents about the performance of the ADP projects in terms of its impact on the rural farmers. The respondents consisted of 144 contact farmers and 144 non-contact farmers. Contact

farmers are those who belong to cooperative societies, while non-contact farmers do not belong. Random and systematic sampling served as the sampling techniques. Research data were analyzed using correlation and inferential techniques. It was found that average yields per hectare of land cultivated by the farmers differed significantly from the average score of the articles of convenience owned by the farmers before implementation and after the implementation of the ADP in all the four crops examined. The reviewed study is similar to the present study because it adopted the survey research design and used questionnaire for data collection. The present study also adopts survey research design and used questionnaire for data collection. The reviewed study is relevant to the present study because it guided the researcher in selecting appropriate research design and method of data collection. The difference between the reviewed study and the present study is that the reviewed study was carried out in Ondo state and used sampled population of contact farmer and non-contact farmers while the present study was carried out in north central Nigeria and used entire population of agricultural extension agents and contact farmers.

Okpogo (2019), carried out a study to ascertain the teaching methods used by agricultural extension agents in communicating innovation to rural farmers in Cross State Nigeria. The study answered four research questions and four hypotheses were tested at 0.05 level of significance. The study adopted survey research design. The population of the study was 308 comprising of farmers and extension agents. All members of the population were used for the study. A structured questionnaire was used for data collection; the instrument was validated by three experts while the data from pilot study for validation was analyzed using cronbach alpha which yielded a coefficient of 0.79. Data was collected by the researcher and three research assistants. Data collected was analyzed using mean and standard deviation for research questions and t-test for testing hypotheses. It was found from the study that the extension delivery techniques adopted include, on-farm visit, small plot adoption technique, field trip, excursion, demonstration, individual delivery, group discussion and others. It was recommended that farmers make themselves available for discussion and demonstration with the extension agents for them to learn new innovations in agriculture.

Idowu and Adaka (2020), examined the level at which farmers adoption of improved farming technology delivered by extension agents enhances farmers livelihood in Osun State. The study had three purposes, three research questions and three hypotheses. Survey research design was adopted. The total population was 297 which is made up of farmers and extension agents. Census sampling was adopted as all members of the population were accessible and manageable. Questionnaire was used for data collection. The instrument was validated by three experts. The reliability was established through a pilot study of 20 related respondents which was analyzed using Cronbach alpha to obtain a coefficient of 0.83. Data was collected by the researcher and three research assistants. 98 percent of the instrument were retrieved and analyzed using mean and standard deviation for research questions and t-test for testing hypotheses. It was found from the study that there is a very high level at which farmer's adoption of improved farming technology delivered by extension agents enhances farmers' livelihood in Osun State. It was recommended that farmers should seek more services from the extension agents since it highly improves the livelihood.



Auta and Dafwang (2016), investigated the status and policy of ADPs in Nigeria. They found that over 63% of the ADPs had a weak or very weak funding status while over 22% had a good to excellent status. The study adopted descriptive survey research design and was guided by three research question. The study found that farmers needed improvement on traditional farming system. The study recommended the organization of rural based projects for the training of farmers in various modern-farm practices. The reviewed study above provides a good background and reference material for the present study on the impact of ADP on the empowerment of rural farmers. The reviewed also guided the researcher in adopting appropriate methodology but differs from the present study in target population and scope (both area and content). While the reviewed study targeted a sampled population of crop farmers in Edo state and covers status and policy of ADP in Nigeria. The present study targeted whole population of contact farmers and extension agents in north central Nigeria and covers impact of ADP on empowerment of rural farmers for improved crop production.

Ammani *et al.* (2016) investigated the “challenges to the sustainability of the ADP system in Nigeria”. The study answers three research questions and tested three hypotheses. It adopted descriptive survey research design. The population of the study was 1,923 made up of 781 registered crop farmers and 142 registered agricultural extension agents in the six agro ecological zones of Nigeria. The sample size for the study was 156 crop farmers and 56 agricultural extension agents (i.e sample size 212) drawn using proportionate stratified random sampling technique. A 40 item questionnaire was used for data collection. Cronbach alpha method was used to determine the internal consistency of the instrument with reliability coefficient of 0.91. Weighed mean and standard deviation were used to answer the research questions and t-test to test hypotheses. The purpose of their study was to analyze the problems perceived to be constraining the sustainability of the ADP, and as a consequence, the effective performance of the ADP system in Nigeria. Inadequate funding was viewed as the focal problem. They developed and transposed a problem tree and used it to transform the identified root causes, and consequences into root solutions. Based on their findings, they suggested that government should focus on improving funding for the ADPs, making deductions from state and federal government revenue allocations from source through a counter-part funding arrangement for the ADPs. The study also guided the researcher on the appropriate methodology to adopt in the present study. The study on the other hand differs from the present as it is limited to challenges to the sustainability of the ADP system in Nigeria and does not cover impact of ADP on the empowerment of rural farmers.

Naswem and Ejembi (2017) carried out a study on “reviving agricultural extension for effective transition from subsistence to commercial agriculture”. Two research questions guided the study. The descriptive survey was adopted. The population was 50 agricultural extension agents and contact farmers drawn from ministry of agriculture and natural resources in cross river state. A 38 multiple choice items using Simpson’s taxonomy of the psycho-motor domain was used for data collection. Kuddder-Richard (K-R20) was used to determine the internal consistency of the instrument which yielded a coefficient of 0.90. The data were analyzed using mean and standard deviation. The purpose of their study was to identify the factors responsible for the erosion of the extension system, and identify a reliable path that will make the system come alive again. This was to trigger the new transformation agenda policy in agriculture. They highlighted the

weaknesses of past extension efforts. The need for the younger generation to be deliberately involved in agriculture was suggested, among other recommendations. The reviewed study guided the researcher in developing psycho-productive questionnaire item on the influence of ADP on farmers. The reviewed above provided a good background and reference materials for the present study. Meanwhile the reviewed study was carried out in cross river state while the present study is carried out in north central Nigeria. Two research questions guided the study while the present study is guided by eight research questions and used a large sample size of 228, while the reviewed study used kuder –Richard (K-R20) to determine the internal consistency of the instrument which yielded a coefficient of 0.91, the present study used cronbach alpha formula and obtained reliability coefficient of .91 and .89 for needed performance categories respectively.

### **3.0 METHODOLOGY**

The study adopted survey research design with study area is called North central region of Nigeria with a population and sample size of 223, comprising of 205 registered active contact farmers and 18 Agricultural Extension agents. The instrument used for data collection was self-developed questionnaire. Validity and reliability coefficients obtained were 0.86, 0.83, 0.72, 0.73 and 0.77 for sections A, B, C, D and E respectively. The overall reliability was therefore 0.78 indicating that the instrument is high in internal consistency and hence reliable for use in the study. The method of data collection was primary source of data collection. The data collected from the respondents was analyzed using mean, standard deviation and t-test statistics. The mean was used to compute data aimed at answering research questions 1 to 5. While the t-test statistics was employed in the computation of data related to the test of hypotheses 1 to 5. The null hypothesis was tested at 0.05 confidence level. The following guidelines were used to interpret and make decisions on the findings of the study. Any item with a mean score of 2.50 and above was accepted, while any item with mean below 2.50 was rejected. Therefore the value of 2.50 is fixed as a cut-off point. The bench mark was calculated using  $4 + 3 + 2 + 1 = 10 / 4 = 2.5$ . For hypotheses, if the absolute value of the calculated t-statistic is larger than the critical value of t (1.96), the null hypothesis was rejected and vice versa. Alternatively, if the p-value is higher than the alpha value of 0.05, the null hypotheses was accepted otherwise rejected.

### **4.0 RESULTS AND DISCUSSION**

This section presents the result of the data analyzed and its interpretation for research questions answered and hypotheses tested. It was presented under results, findings and discussion of findings.

#### **4.1 Results.**

**4.1.1 Research question 1:** What are the teaching methods used by ADP extension agents for effective teaching of farm technologies to enhance the living standard of the rural farmers?

**Table 1: Mean Rating and Standard Deviation of Respondents on Teaching Methods used by ADP Extension Agent to Influence Living Standard of Rural Farmers N-217**

Items										
SN	The ADP teaching methods of farm technologies that influenced rural farmers living standard	N <sub>1</sub>	N <sub>2</sub>	X <sub>1</sub>	X <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	RMK		
1	ADP personnel use farm and home visits methods,	17	200	3.52	3.43	.51	.49	A		
2	Supervisory field visits to village extension agents (VEAs) were made	17	200	2.52	3.31	.51	.48	A		
3	Technology review and training meetings were held.	17	200	3.17	3.38	.39	.51	A		
4	Field visits to the farmer's farm by VEAs	17	200	3.64	3.49	.49	.57	A		
5	Contact farmers were reached out to by VEAs.	17	200	3.17	3.37	.63	.62	A		
6	ADP use demonstration methods	17	200	3.64	3.3	.49	.49	A		
7	On-farm adaptive researches (OFAR) were carried out	17	200	3.23	3.47	.43	.52	A		
8	Small plot adaptive techniques (SPAT) on crops were established	17	200	3.41	3.54	.5	.53	A		
9	Radio and Televisions are used as a medium of teaching.	17	200	3.88	3.53	.33	.53	A		
10	Group meeting is used to teach farmers.	17	200	3.47	3.35	.62	.6	A		
11	Offices calls is used to gather farmers	17	200	3.41	3.37	.5	.5	A		
12	Field trips by extension staff are used to teach farmers	17	200	3.23	3.46	.43	.56	A		
13	Bulletins are used as medium of teaching and learning	17	200	3.29	3.54	.46	.57	A		
14	Newspapers are used as medium of teaching and learning	17	200	3.29	3.41	.46	.51	A		
15	use discussion method to adopt new farm innovations	17	200	3.64	3.48	.49	.51	A		
16	Experimentation method used by the extension workers influenced improved farm practices to farmers	17	200	3.7	3.43	.58	.57	A		
17	ADP use tours/excursions to enables the farmer to accept and adopt the new farm practices shown	17	200	3.7	3.26	.58	.67	A		
18	ADP use firms/cinemas to teach new technology.	17	200	1.88	2.09	.33	.33	D		
19	ADP use videos to explain new technology	17	200	2.94	3.39	.42	.49	A		
20	ADP use what-app to explain new technology	17	200	2.46	2.13	.98	.51	D		
21	ADP use YouTube to teach rural farmers to adopt new technology	17	200	2.42	2.07	1.09	.58	D		
<b>Pooled</b>				<b>3.22</b>	<b>3.23</b>	<b>.54</b>	<b>.53</b>			

**Keys:** N<sub>1</sub>- Number of agricultural extension agents, N<sub>2</sub>-mean of contact farmers, X<sub>1</sub>- mean of agricultural extension agents X<sub>2</sub>- mean of contact farmers, S<sub>1</sub>,-standard deviation of agricultural extension agents, S<sub>2</sub>-standard deviation of contact farmers, D- disagree, A-agree.

The result of the data presented in Table 1 revealed that all the items except items 18, 20 and 21 had their mean scores ranging from 2.52 to 3.88 for agricultural extension agents and 3.3 to 3.54 for farmers, which are above the cut off mean of 2.50. This means that those items are the teaching methods used by ADP extension agents for effective teaching of farm technologies to enhance the living standard of the rural farmers. Meanwhile, items 18, 20 and 21 for both agricultural extension agents and farmers had their mean scores below the cut off mean. This means that the respondents disagreed that the items are not the teaching methods used by ADP extension agents for effective teaching of farm technologies to enhance the living standard of the rural farmers.

**4.1.2 Hypothesis 1:** There is no significant difference in the mean rating of the response of rural contact farmers and agricultural extension agents on the Teaching methods used by ADPs for effective teaching of improved farm technologies to influence the living standard of the rural farmers.

**Table 2: t-Test result of the respondents on the Teaching methods used by ADPs for effective teaching of improved farm technologies to influence the living standard of the rural farmers**

Occupation	N	Mean	Std	Std. Error Mean	Df	Sig	t-cal	Alpha value	Remark
Ext. agents	17	3.22461	.540006	.60168	215	.671	.425	.05	NS
Farmers	200	3.230714	.536436	.22147					

**Keys:** N= Number of respondents, Std = Standard deviation, df = degree of freedom, Sig. = P-value; t-cal = t-calculated value; P <.05, NS = Not Significant. t-critical-1.96

**Source:** Field survey, 2022

Table 2 presents the result of the t-test analyses on the teaching methods used by ADPs for effective teaching of improved farm technologies to influence the living standard of the rural farmers. The result shows that the t-cal is 0.425, which is less than the critical value of 1.96 at 215 degree of freedom, implying that the null hypothesis is accepted. This means that there is no significant different between the mean response of contact farmers and agricultural extension agents on the teaching methods used by ADPs for effective teaching of improved farm technologies to influence the living standard of the rural farmers.

**4.1.3 Research question 2:** What are the rural farmers' constraints in successful participation in the ADP project.

**Table 3: Mean Rating and Standard deviation of the Respondents on the Rural Farmers' Constraints in Successful Participation in the ADP Project**

		N-217						
S/ N	Items	N <sub>1</sub>	N <sub>2</sub>	X <sub>1</sub>	X <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	RMK
1	Undue political interference by some states resulted in too frequent changes in ADP management and recruitment of qualified personnel	17	200	3.7	3.51	.46	.55	A
2	Inability of some state governments to provide counterpart funding as required by the loan agreement.	17	200	3.41	3.40	.61	.49	A

3	climatic conditions of the farm environment	17	200	3.11	3.47	.48	.53	A
4	Natural disasters such as flooding	17	200	3.23	3.44	.43	.54	A
5	Wind erosion in northern part of Nigeria	17	200	3	3.29	0	.48	A
6	Illiterate farmers find it difficult to adopt new farm innovations	17	200	3.70	3.57	.46	.56	A
7	Extension workers spend much time to convince the illiterate farmers to adopt new farm innovations	17	200	3.23	3.47	.43	.55	A
8	Farmers do not adopt certain modern agricultural practices that conflict with their traditions, customs and beliefs.	17	200	3.29	3.31	.46	.50	A
9	Inadequate transport facilities prevent the extension staff from visiting the majority of farmers and getting in constant touch with them.	17	200	3.70	3.40	.46	.49	A
10	Inadequate extension staff which prevents constant touch with farmers and getting the necessary expert advice	17	200	3.70	3.37	.46	.51	A
11	Farmers are not allowed to participate in planning the extension projects.	17	200	3.35	3.44	.49	.55	A
12	High cost of farm inputs hinder farmers progress	17	200	3.35	3.31	.49	.48	A
13	Lack of sufficient land to cultivate	17	200	3.29	3.46	.46	.50	A
14	Poor soil fertility status is a major challenge	17	200	3.58	3.44	.50	.55	A
15	Lack of improved seed for planting	17	200	3.70	3.43	.46	.57	A
16	High cost of farm labour	17	200	3.35	3.22	.49	.47	A
17	High incidence of pest and diseases infestation	17	200	3.47	3.42	.51	.53	A
18	Poor storage facilities	17	200	3.52	3.46	.51	.557	A
19	Poor marketing facilities	17	200	3	3.31	.35	.47	A
20	Incompatibility of innovations	17	200	3.58	3.48	.61	.57	A
21	Poor extension agent-farmer contact	17	200	3.17	3.47	.39	.54	A
22	Irregular visit from Fadama state office	17	200	3.17	3.47	.39	.56	A
23	Low price of farm produce	17	200	3.17	3.27	.95	.48	A
24	Slow implementation of project plans	17	200	3.52	3.56	.51	.50	A
25	Difficulty in integrating technology to existing production system	17	200	3.29	3.45	.46	.50	A
26	Incompetency of some extension agents in dissemination of information	17	200	3.52	3.39	.51	.49	A
27	Lack of credit facilities	17	200	3.35	3.35	.49	.49	A
28	Constant communal land crises	17	200	3.64	3.42	.60	.56	A
29	Constant herdsmen conflict	17	200	3.23	3.46	.43	.60	A
<b>Pooled</b>				<b>3.39</b>	<b>3.41</b>	<b>.48</b>	<b>.52</b>	<b>A</b>

**Keys:** N<sub>1</sub>- Number of agricultural extension agents, N<sub>2</sub>-mean of contact farmers, X<sub>1</sub>- mean of agricultural extension agents X<sub>2</sub>- mean of number of contact farmers, S<sub>1</sub>,-standard deviation of agricultural extension agents, S<sub>2</sub>-standard deviation of contact farmers, D-disagree, A-agree.

The result of the data presented in Table 3 revealed that all the items had their mean scores ranging from 3.00 to 3.70 for agricultural extension agents and 3.22 to 3.57 for contact farmers, which are all above the cut off mean of 2.50. This means that all the respondents agreed that all the items are the constraints to rural farmers' participation in the ADP projects. The standard deviation falls within 0.48 and 0.52 and are close to each other, implying that the responses from the respondents are not far from each other.

**4.1.4 Hypothesis 2:** There is no significant difference between the mean response of contact farmers and agricultural extension agents on the constraints in successful participation in the ADP project.

**Table 4: t-Test Result of the Respondents on the Rural Farmers' Constraints in Successful Participation in the ADP Project**

Occupation	N	Mean	Std	Std. Error Mean	Df	Sig	t-cal	Alpha value	Remark
Ext. agents	17	3.395534	.483562	.91602	215	.464	-.734	.05	NS
Farmers	200	3.418103	.52674	.24820					

**Keys:** N= Number of respondents, Std = Standard deviation, df = degree of freedom, Sig. = P-value; t-cal = t-calculated value; P < .05, NS = Not Significant. t-critical-1.96

**Source:** Field survey, 2022

Table 4 presents the result of the t-test analyses on the constraints in the rural farmers' successful participation in the ADP project. The result shows that the t-cal is 0.734, which is less than the critical value of 1.96 at 215 degree of freedom, implying that the null hypothesis is accepted. This means that there is no significant difference between the mean response of contact farmers and agricultural extension agents on the constraints in rural farmers' successful participation in the ADP project.

**4.1.5 Research question 3:** To what extent does rural farmers' adoption of improved farming practices influence their living standard?



**Table 5: Mean Rating and Standard Deviation of Agricultural Extension Agents and Contact Farmers on the Extents to which Adoption of Improved Farming Practices Influenced Rural Farmers' Living Standard**

N-217								
S/N	Items	N <sub>1</sub>	N <sub>2</sub>	X <sub>1</sub>	X <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	RMK
1	Farmers can apply fertilizers to their crops to improve production	17	200	3.70	3.56	.46	.49	VH
2	Farmers can use spraying machines to spray agro-chemicals on their farms to improve crop production.	17	200	3.58	3.64	.50	.47	VH
3	Farmers use improved seeds and seedlings	17	200	3.41	3.23	.50	.42	H
4	Farmers adopt crop rotation techniques to boost crop production	17	200	3.70	3.56	.46	.51	VH
5	Farmers plant leguminous cover crops during fallow periods	17	200	3.76	3.6	.43	.49	VH
6	Farmers feed their animals with modern livestock feeds, e.g. starters and finishers.	17	200	3.64	3.42	.49	.52	VH
7	Farmers use pesticides to control pests	17	200	3.47	3.58	.51	.50	VH
8	Farmers use modern farm machineries to increase their farm size	17	200	3.35	3.42	.60	.59	H
9	Most Farmers have changed from subsistence farming into large scale farming.	17	200	3.58	3.58	.50	.51	VH
10	ADP Extension service helps me to boost agricultural productivity.	17	200	3.64	3.53	.49	.50	VH
11	ADP Extension service helps me to boost my earning power	17	200	3.47	3.45	.51	.50	H
12	ADP helps me to increase my income	17	200	3.47	3.40	.51	.50	H
13	ADP provides employment to me through improved agriculture	17	200	3.58	3.63	.50	.48	VH
<b>Pooled</b>				<b>3.57</b>	<b>3.51</b>	<b>.50</b>	<b>.50</b>	<b>VH</b>

**Keys:** N<sub>1</sub>- Number of agricultural extension agents, N<sub>2</sub>-mean of contact farmers, X<sub>1</sub>- mean of agricultural extension agents X<sub>2</sub>- mean of number of contact farmers, S<sub>1</sub>,-standard deviation of agricultural extension agents, S<sub>2</sub>-standard deviation of contact farmers, H-high, V.H- very high.

Table 5 presents the result of the data analyzed on the extent to which rural farmers' adoption of improved farming practices influence their living standard. The result shows a pooled mean of 3.57 and 3.51 for agricultural extension agents and contact farmers respectively. This is within the upper and lower limit of 4 in the real limit of numbers. This implies that there is a very high extent to which rural farmers' adoption of improved farming practices influence their living standard.

**4.1.6 Hypothesis 3:** There is no significant difference between the mean ratings of rural contact farmers and agricultural extension agents on the extent to which rural farmers' adoption of improved farming practices influence their living standard

**Table 6: t-Test Result of the Respondents on the Extent to which Rural Farmers Adoption of Improved Farming Practices Influence their Standard of Living**

Occupation	N	Mean	Std	Std. Error Mean	Df	Sig	t-cal	Alpha value	Remark
Ext. agents	17	3.570138	.503138	.56918	215	.120	1.561	.05	NS
Farmers	200	3.51	.503318	.13788					

**Keys:** N= Number of respondents, Std = Standard deviation, df = degree of freedom, Sig. = P-value; t-cal = t-calculated value; P < .05, NS = Not Significant. t-critical-1.96

**Source:** Field survey, 2023

Table 6 presents the result of the t-test analyses on the extent to which adoption of improved farming practices influence their standard of living. The result shows that the t-cal is 1.561, which is less than the critical value of 1.96 at 215 degree of freedom, implying that the null hypothesis is accepted. This means that there is no significant different between the mean response of Agricultural extension agents and contact farmers on the extent to which adoption of improved farming practices influence their standard of living.

**4.1.7 Research question 4:** To what extent do provision of infrastructural facilities to rural farmers by ADPS influence rural farmers standard of living

**Table 7: Mean Rating and Standard Deviation of the Respondents on the Extent to which ADP Provision of Infrastructures to Rural Farmers Influenced Living Standard N-217**

S/N	Items	N <sub>1</sub>	N <sub>2</sub>	X <sub>1</sub>	X <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	RMK
1	ADP provides access roads in my community	17	200	3.52	3.51	.62	.53	VH
2	ADP provides culverts in my community	17	200	3.41	3.49	.61	.57	H
3	ADP the provides dam for irrigation in my community	17	200	3.35	3.49	.49	.50	H
4	ADP provides tube wells in my communities	17	200	3.76	3.53	.43	.50	VH
5	ADP provides bore holes in my community	17	200	3.64	3.39	.60	.55	H
6	ADP has enhanced fadama development in my community	17	200	3.29	3.45	.46	.51	H
7	ADP provides rural agro-industrial scheme for processing crop products	17	200	3.70	3.59	.46	.54	VH
8	ADP has recorded achievement in the area provision of farm service centres	17	200	3.58	3.54	.61	.53	VH
8	ADP has enhanced provision of balance food crops for rural farmers well being	17	200	3.64	3.52	.49	.50	VH
9	ADP disseminates improved Agricultural technologies to rural farmers through effective extension delivery.	17	200	3.76	3.44	.43	.50	VH
10	ADP provides improved farm seeds to farmer to improved crop production	17	200	3.52	3.57	.62	.55	VH

11	ADP educates rural farmers on how to get better market for their farm produce	17	200	3.47	3.51	.62	.53	H
12	ADP provides improvement of extension staff training	17	200	3.94	3.49	.24	.52	VH
13	ADP provides improvement of rural farmers training on crop production	17	200	3.64	3.55	.60	.56	VH
14	Introduction of new credit and marketing services	17	200	3.70	3.57	.46	.54	VH
15	ADP supplies improved farm inputs (fertilizer& improved seeds) to rural farmers in my community	17	200	3.47	3.48	.51	.50	H
16	ADP educates rural farmers on agro-processing technologies.	17	200	3.64	3.52	.49	.51	VH
17	ADP empowers rural farmers on agro- storage technologies	17	200	3.35	3.3	.60	.55	H
18	ADP empowers rural farmers to increase crop production by helping to adopt improved farm technologies	17	200	3.70	3.6	.46	.50	VH
19	ADP Link farmers to sources of fund (soft-loan grants)	17	200	3.47	3.51	.51	.51	H
20	Disseminate improved agricultural technologies from research centres and institutions to farmers through effective extension delivery.	17	200	3.41	3.39	.61	.52	H
<b>Pooled</b>				<b>3.57</b>	<b>3.49</b>	<b>.52</b>	<b>.52</b>	<b>VH</b>

**Keys:** N<sub>1</sub>- Number of agricultural extension agents, N<sub>2</sub>-mean of contact farmers, X<sub>1</sub>- mean of agricultural extension agents X<sub>2</sub>- mean of number of contact farmers, S<sub>1</sub>-standard deviation of agricultural extension agents, S<sub>2</sub>-standard deviation of contact farmers, H-high, V.H- very high

Table 7 presents the result of the data analyzed on the extent to which provision of infrastructural facilities to rural farmers by ADPS influence rural farmers standard of living. The result shows a pooled mean of 3.57 and 3.49 for agricultural extension agents and contact farmers respectively. This is within the upper and lower limit of 4 for agricultural extension agents and within the upper and lower limit of 3 for contact farmers. This implies that there is a very high extent to which provision of infrastructural facilities to rural farmers by ADPS influence rural farmers standard of living.

**4.1.8 Hypothesis 4:** There is no significant difference between the mean ratings of rural contact farmers and agricultural extension agents on the extent to which provision of infrastructural facilities to rural farmers by ADPs influence their standard of living

**Table 8: t-Test Result of the Respondents on the Extent to which Provision of Infrastructural Facilities to Rural Farmers Influence their Standard of Living**

Occupation	N	Mean	Std	Std. Error Mean	Df	Sig	t-cal	Alpha value	Remark
Ext. agents	17	3.574238	.526158	1.11629	215	.094	1.683	.05	NS
Farmers	200	3.499048	.529293	.25686					

**Keys:** N= Number of respondents, Std = Standard deviation, df = degree of freedom, Sig. = P-value; t-cal = t-calculated value; P <.05, NS = Not Significant. t-critical-1.96

**Source:** Field survey, 2023

Table 8 presents the result of the t-test analyses on the extent to which provision of infrastructural facilities to rural farmers by ADPs influence their standard of living. The result shows that the t-

cal is 1.683, which is less than the critical value of 1.96 at 215 degree of freedom, implying that the null hypothesis is accepted. This means that there is no significant difference between the mean response of Agricultural extension agents and contact farmers on the extent to which provision of infrastructural facilities to rural farmers by ADPS influence their standard of living.

**4.1.9 Research question 5:** What are the influence of ADPs on the living standards of rural farmers?

**Table 9: Mean Rating and Standard Deviation of the Respondents on the Influence of ADPs on the Living Standard of farmers**

		N-217						
S/N	Items	N <sub>1</sub>	N <sub>2</sub>	X <sub>1</sub>	X <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	RMK
1	Advent of ADP has created access roads for sales of crops.	17	200	3.29	3.44	.46	.49	A
2	ADP extension staff provide training to rural farmers	17	200	3.64	3.43	.49	.49	A
3	ADP creates agricultural job opportunities for youths in the rural areas	17	200	3.35	3.44	.49	.49	A
4	Rural farmers adoption of modern farming technologies has increased supply of food crops for sale to generate more income	17	200	3.41	3.40	.50	.62	A
5	Use of improved crop varieties leads to high yield and more income to farmers.	17	200	3.17	3.42	.39	.49	A
6	The adoption of improved crops production technology has increased farmers purchasing power.	17	200	2.76	3.19	.75	.69	A
7	Fertilizer use has enabled me to increase my output	17	200	3.29	3.29	.46	.49	A
8	ADP has created awareness of high productivity of food crops	17	200	3.52	3.45	.62	.55	A
9	ADP has raised educational awareness among farmers to send their children to school.	17	200	3.58	3.46	.50	.57	A
10	ADP has enabled use of feeds and balanced diet.	17	200	3.41	3.46	.50	.50	A
11	ADP has raised the awareness and access to good water supply	17	200	3.11	3.29	.99	.75	A
12	ADP has increased the purchasing power of farmers in terms of house hold goods.	17	200	3.35	3.15	.49	.66	A
13	ADP provides Training to rural farmers on modern storage technology of farm inputs,	17	200	3.70	3.58	.57	.58	A
14	Farmers building their own houses from farming business, was an index of quality of life	17	200	3.47	3.53	.55	.52	A
15	ADP provides Training on techniques of making farm manure/compost to improve rural farm crop yields.	17	200	3.17	3.26	.63	.51	A
16	ADP provides Training on techniques of land preparation for improved crop production.	17	200	3.41	3.47	.50	.50	A
17	ADP provides training on mechanized farming for improved crop production of the rural farmers	17	200	3.47	3.38	.51	.63	A
18	ADP provide training for its personnel to improve farm work and job satisfaction	17	200	3.29	3.42	.46	.48	A

19	New farm practices made available to me by extensions workers has been adopted	17	200	3.17	3.35	.52	.53	A
20	Training on tractor use has improved crop production.	17	200	3.29	3.31	.46	.46	A
21	Training on the use of improved crop seeds have improved crop production	17	200	3.52	3.48	.51	.53	A
22	ADP training on yam mini-setts technology has improved yam crop production	17	200	3.35	3.35	.49	.66	A
23	The expenditure on goods (radios, TV, vehicles, furniture) was an indicator of improved standard of living	17	200	3.35	3.41	.49	.50	A
24	Training on application of fertilizers was done with farmers participating	17	200	2.58	3.19	.61	.70	A
25	Utilization of insecticides by farmers has controlled insect-pest	17	200	3.35	3.43	.60	.54	A
26	Rural farmers are trained on how to spray herbicides to control Weeds on their farms to improve crop yield	17	200	3.64	3.54	.49	.54	A
27	Fertilizer usage by farmers increased output of farm crops	17	200	3.17	3.36	.39	.56	A
28	Assorted agrochemicals were sold to the farmers	17	200	3.29	3.36	.46	.49	A
<b>Pooled</b>				<b>3.32</b>	<b>3.39</b>	<b>.53</b>	<b>.55</b>	<b>A</b>

**Keys:** N<sub>1</sub>- Number of agricultural extension agents, N<sub>2</sub>-mean of contact farmers, X<sub>1</sub>- mean of agricultural extension agents X<sub>2</sub>- mean of number of contact farmers, S<sub>1</sub>,-standard deviation of agricultural extension agents, S<sub>2</sub>-standard deviation of contact farmers, D-disagree, A-agree

The result of the data presented in Table 9 shows that all the items had their calculated value ranging from 2.58 to 3.70 for agricultural extension agents and 3.15 to 3.58 which are all above the cut off mean of 2.50. This implies that all the items are the ways IDPs influence the living standard of rural farmers. The result also shows that all the items had their standard deviation ranging from 0.39 to 0.99, implying that the responses of the respondents are not far from each other.

**4.1.10 Hypothesis 5:** There is no significant difference between the mean ratings of rural contact farmers and agricultural extension agents on the influence of ADPs on farmers' standard of living

**Table 10 t-Test Result of the Respondents on the Influence of ADPs on the Living Standard of farmers**

Occupation	N	Mean	Std	Std. Error Mean	Df	Sig	t-cal	Alpha value	Remark
Ext. agents	17	3.329829	.536032	1.97322	215	.245	-1.167	.05	NS
Farmers	200	3.390179	.55932	.38846					

**Keys:** N= Number of respondents, Std = Standard deviation, df = degree of freedom, Sig. = P-value; t-cal = t-calculated value; P <.05, NS = Not Significant.

**Source:** Field survey, 2022

Table 10 presents the result of the t-test analyses on the influence of ADPs on the living standards of rural farmers. The result shows that the t-cal is -1.167, which is less than the critical value of

1.96 at 215 degree of freedom, implying that the null hypothesis is accepted. This means that there is no significant different between the mean response of contact farmers and agricultural extension agents on the influence of ADP on the rural farmers living standard.

#### **4.3 Discussion of the Findings**

The findings of the study in research question 1 revealed that there are 18 teaching methods used by ADP extension agents to influence the living standard of rural farmers. The finding is in line with Okpogo (2019), who found that extension delivery techniques adopted to communicate innovation to farmers include on-farm visit, small plot adoption technique, field trip, excursion, demonstration, individual delivery, group discussion and others. The findings of the study is also in agreement with Enwelu *et al.* (2017), who found that extension agents means of communicating the farmers include farm visit, SPAT, individual meeting, group discussion and other. More so, the findings of the study in hypothesis 1 is in line with Okpogo (2019), who found no significant difference in the response of farmers and extension agents on the teaching methods used by agricultural extension agents in communicating innovation to rural farmers in Cross State Nigeria.

The findings of the study in research question 2 revealed that there are 29 constraints to the rural farmers' successful participation in the ADP project. This finding is in agreement with. Okuokenye & Okoedo-Okojie (2014), who found that the major constraints to the farmers participation and implementation of Agricultural Development projects were found to include restricted coverage of farms and wrong selection of participants. The finding is also in keeping with Chukwuemeka and Nzewi (2013), who found in their study that political considerations, rather than expertise and professionalism was found to characterize the recruitment of extension staff and selection of farmers to benefit from projects. The findings of the study in hypothesis 2 is in keeping with Ammani *et al.* (2016), who found that the responses of extension agents and farmers on the challenges to the sustainability of the ADP system in Nigeria are not statistically significant.

The findings of the study in research question 3 revealed that there is a very high extent to which adoption of improved farming practices influence the living standard of rural farmers. This finding is in accordance with Idowu and Adaka (2020), who found that there is a very high level at which farmer's adoption of improved farming technology delivered by extension agents enhances farmers' livelihood in Osun State. The finding is also in keeping with Ugwu (2014), who found that ADP has improved the livelihood of rural farmers through imparting of better farming skills to them. The finding of the study in hypothesis 3 is in tandem with Idowu and Adaka (2020), who found that was also found that there is no statistical significant different between the mean response of farmers and extension agents in all the three hypotheses tested on the level at which farmer's adoption of improved farming technology delivered by extension agents enhances farmers' livelihood in Osun State

The findings of the study in research question 4 revealed that to a very high extent, ADP's provision of infrastructure has influenced the living standard of rural farmers. This finding is in accordance with Inegbedion *et al.* (2018), who found from their study that agricultural extension service has led to the provision of basic infrastructure for the rural farmers which has to highly



improve their livelihood. However, the finding disagrees with Chukwuemeka and Nzewi (2013), who found that the extent to which the Project had achieved set objectives of improving rural living standard was low. This could be due to difference in location of the two studies. More so, the findings of the study in hypothesis 4 is in line with Umeh *et al.* (2015), who found that the result of the hypothesis tested on the extent of performance of ADP in Abia with that of Enugu States in Nigeria was not significant in 8 indices.

The findings of the study in research question 5 revealed that there are 28 ways ADP influence the living standard of rural farmers. The finding is in agreement with Adamu and Mohammed (2016), who found that ADP has impacted Adamawa State rural farmers on their productivity, income, access to credit, and general standard of living using assets ownership criterion. In line with the findings of this study also, Dare et al. (2014), found that Agricultural Development Projects have significantly increased food production in the locality through increased provision of pesticides and improved seeds to farmers, establishment of new infrastructure and provision of fertilizers. More so, the findings of the study in hypothesis 5 is in line with Ugwu (2014), who found that there is no significant difference in the mean response of the respondents on the hypothesis tested on the contributions of ADPs to rural livelihood and food security in Nigeria.

## **5.0 CONCLUSION AND RECOMMENDATIONS**

### **5.1 Conclusion**

Based on the findings of the study, it was concluded that Agricultural Development Project extension agents adopt 18 teaching methods to influence farmers, which include farm or home visits, field trips, demonstration, On-Farm Adoptive Technique (OFAR), Small Plot Adaptive Technique (SPAT), office call, bulletin posters, newspapers,, radio, television, group meeting, discussion, experimental method, films cinema, and video. Despite the 29 challenges such as political interference, lack of funding, inability to pay counterpart funding, inability to convince illiterate farmers to adopt new technology, natural disasters, high cost of farm inputs, inadequate extension workers, poor soil fertility, lack of improved seeds, high cost of farm labour, poor marketing facilities,, poor storage facilities, insufficient land, poor extension agent-contact farmers, irregular visit, low price of farm produce, slow implementation of project plan, diseases, pests, difficulty of integrating technology, incompetency of some extension agents, incompatibility of innovation, farmers are not allowed to plan in the project, poor dissemination of information, lack of credit facilities, constant communal crises, constant and herdsmen conflict constraining farmers participation in the project, (ADP) has to a very high extent influenced the living standard of the rural contact farmers indicated in increased food crop production, higher income and improved social amenities.

### **5.2 Recommendations**

Based on the results of this study, of the study, the following recommendations were made;

- i. Farmers should seek more services of the extension agents through the teaching methods revealed from this study as they have been found to influence their standard of living
- ii. ADP extension agents should continue to improve farmers' production practices through their various services as it has been established that it influences their standard of living.
- iii. Farmers should form cooperative societies to augment their needs for more extension training

- iv. All farmers should endeavor to participate in ADP programmes in order to enhance their living standard.

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