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EFFECT OF NATIONAL AGRICULTURAL EXTENSION AND RESEARCH LIAISON SERVICES ADOPTED VILLAGE ACTIVITIES ON LIVELIHOOD OF WOMEN IN ZARIA, KADUNA STATE, NIGERIA

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ABSTRACT
The NAERLS established the adopted village scheme within 20km distance from the head office that served as laboratories for showcasing agricultural technologies developed by research institutes. Sustainable agricultural development cannot be fully achieved without the integration of women in developmental processes. Using 136 adopted village women in Zaria, this study assessed the effect of NAERLS adopted village activities on livelihood of women. Multi-stage sampling was used to select the women for the study. Structured interview schedule was used to obtain data from the sample population. Analysis of socio-economic characteristics showed that the mean age of the respondents was 40, majority (72%) of the women were married, only 48.5% have senior secondary certificate, 33.8% of the respondents get occasional visits from NAERLS adopted village facilitators. It was found that there has been not much participation in the activities of adopted village in the past one year. Most of the respondents agree that NAERLS adopted village activities have been effective on their livelihood through increase in their annual income and improved crop harvest from their farms. Various constraints on participation of women in the adopted village activities were identified of which inability to leave their children unattended was the most encountered among the respondents. It can be said conclusively that the NAERLS adopted village activities had effect on livelihood of women in the study area. Government should provide more funding to strengthen the NAERLS adopted village project for it to effectively cater to the needs of women in the adopted villages.

Keywords: Adopted village, Livelihood, Participation, Visits, Women.

INTRODUCTION
In an effort to solve the problem of food production, rural development and improvement of the lives of rural people, the National Agricultural Research Project (NARP) under the World Bank assisted programme in 1996, introduced the Adopted villages concept to the National Agricultural Research Institutes (NARIs), of which the National Agricultural Extension and Research Liaison Services (NAERLS) is one (Agricultural Research Council of Nigeria, ARCN, 2011). The NAERLS as one of the research institutes under the NARIs, established the adopted village scheme within 20km distance from the head office that served as laboratories for showcasing agricultural technologies developed by research institutes. Thus, the offices of the adopted villages served as Agricultural Research Outreach centers (AROCs), jointly managed by the farmers and NAERLS (NAERLS, 2014).

The adopted village concept which originated from India was initiated to facilitate the trial of new research findings by scientists under the farmers' environmental conditions. The advantage was to involve farmers in farm technology trials either as observers, in the case of researcher managed, or executors in the case of farmer managed trials. The assumption was

that involvement of farmers will in turn speed up the rate of adoption of agricultural technologies to other farmers since the trials also served as demonstration plots. This approach will further enhance and facilitate the principle of adult learning axiom "I hear, I think, I see, I believe, I do, I know". Thus, concept of adopted village was established for developing and evaluating technologies emanating from the NARIs. The villages were to help in early dissemination and evaluation of the technologies after the institutes had conducted their on-farm –adoptive-research (OFAR). Each institute was to identify two commodities in their mandate areas and select farmers who are willing to use their technologies (NAERLS, 2014).

In connection with agricultural extension services, Haile (2016) stated that, "The agricultural extension services have been largely designed, crafted and implemented with the male head of the household as the intended client, and failed to recognize that women are active, productive, economic agents with their own financial needs and constraints". Thus, women tend to have less contact to extension services than men and generally use lower levels of technology because of problems of access, cultural restrictions on use or lesser interest in doing research on women's crops and livestock (World Bank, 2003). In this system, men are always the first and perhaps the only target recipient of the planned change in agriculture (Tologbonse *et al.*, 2013). Available evidence shows that women still lag behind in terms of extension contact, accessibility to training and other indices of development education for agriculture (Tologbonse *et al*., 2013). Lack of training on extension services and mechanization was reported by Dave (2020) and Ng'ombe *et al*. (2020) as a serious challenge that women face in the sector. Drafor and Puplampu (2013) identified limited access to finance and farm inputs as the major challenges women face. The Sahel Capital and Advisory Limited (SCA, 2014) indicated that women receive less than 10% of credit offered to small scale farmers in Nigeria due to limited access to collateral. The marital status of women has been acknowledged to limit their contribution to agricultural activities, Nuhu *et al.* (2014) in their correlation test on barriers to women's effective participation in agricultural production shows that only marital status had negative correlation at 5% level of significance.

It should be noted that economic growth, rural development and consequently, the alleviation of poverty in Nigeria through sustainable agricultural development cannot be fully achieved without the integration of women in developmental processes. Considering women in formulating agricultural programmes and policies and implementing appropriate strategies enhances their capabilities. Even though the NAERLS adopted village has been implemented since about two decades, most women in Zaria, Kaduna State, Nigeria lack the necessary resources to access the needed agricultural technology to enhance their productivity and livelihood. This study therefore was conceived to ascertain the effect of the NAERLS adopted village activities on the livelihood of women in Zaria local Government Area of Kaduna State, Nigeria. This is because one of the stated objectives of the NAERLS adopted village project is to 'enhance job and self-employment opportunities for youth and women'. Specifically, the objectives of the study were to:

i. describe the socio-economic characteristics of women participating in the NAERLS adopted village project examine the level of participation of women in the NAERLS;
ii. adopted village activities;
iii. determine the effect of these activities on the livelihood of women participating in the NAERLS adopted village project; and
iv. identify the constraints to women participation in the NAERLS adopted village project.

MATERIALS AND METHODS

From the 2006 population census, Zaria was estimated to have 736,000 people (National Population Commission (NPC, 2006). The latitude of Zaria, Nigeria is 11.08554, and the longitude is 7.719945**,** with the GPS coordinates of 11° 5' 7.9476" N and 7° 43' 11.8020" E. As at the time this study was conducted, there were nine (9) active women cooperative groups consisting of 448 women participating in the NAERLS adopted village project in Zaria, which were used as the sample frame. Proportional sampling was used to select 30% of women from the total population in each group. While a simple random sampling technique (manual lottery method) was used to obtain the sample size. A structured 'interview scheduled was used to collect information from the respondents.

Table 1: Sample distribution of women groups

Women groups	**Total population**	**Sample size (30%)**
Tudun Wada Zaria women amalgamation	25	8
Kakaaki Zaria women	95	29
Tudun wada Zaria kayan Allah women	30	9
Kakaaki albarkawa alheri women	55	17
Gyallesu matan aure da sana'a	60	18
Kofar kibo women dairy farmers	20	6
United women multipurpose cooperative society limited	86	26
Mus'ada women cooperative society limited	50	15
Kofar doka women ethics and value	27	8
TOTAL	**448**	**136**

Source: NAERLS, 2021.

Descriptive statistics and Likert-type scale were used to achieve the stated objectives. A three-point Likert scale (often = 2, occasionally = 1 and never = 0) was used to achieve objectives ii and iv. A mean score of equal and/or above the cut-off mean of 1 was classified as active and any mean score lower than 1 was classified as inactive. While in the case of objective iii, the response was categorized in accordance with a four-point Likert-scale (very, moderately, slightly and not at all).

RESULTS AND DISCUSSION

Socio-economic Characteristics

In Table 2, the mean age of the respondents is 40. This shows that the age population of the women in the study area is agile, active and energetic; necessary for improved livelihood participation. Thus, older women are considered to be less receptive to innovative livelihood changes and consequently remain inefficient. In their separate studies, Ayoade (2012) and Okafor and Umebali (2019) found the mean age of women was 41.8 and 42.6 in Osun State and Southeast, Nigeria, respectively. The majority (72%) of the respondents were married, this implies that the married respondents have additional household member that could encourage women participation in the adopted village activities. This result agrees with the findings of Okafor (2019), who found that 71.8% of women were married in their study on effects of agricultural extension services on the performance of members of women agricultural cooperatives in Southeast, Nigeria. Most of the respondents (48.50%) attended secondary school and have senior secondary certificate. This result indicates that the women had some form of formal education. Oladimeji *et al*. (2015) opined that education assists farmers in accessing and interpreting information regarding alternative livelihood activities.

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Table 2: Socio-economic characteristics of women participants in NAERLS adopted village activities

Variables	Frequency	Percentage	Mean
Age (years)			
16-25	10	7.4	
26-35	37	27.2	
36-45	44	32.4	40
46-55	34	25.0	
Above 55	11	8.4	
Marital status			
Married	98	72.0	
Single	38	28.0	
Level of formal education			
Qur'anic	29	21.30	
Primary	20	14.70	
Secondary	66	48.50	
Higher education	21	15.50	
Household size			
1-5	35	25.0	
6-10	78	58.1	8.5
Above 10	23	16.9	

Source: Field Survey, 2021

Table 2: Socio-economic characteristics of women participants in NAERLS adopted village Activities **Cont'd.**

Variables	Frequency	Percentage	Mean
Annual farm income			
≤ 20000	44	32.4	
21000-40000	38	27.9	
41000-60000	32	23.5	35000
> 60000	22	16.2	
Visits by NAERLS adopted village facilitators			
Occasionally	46	33.8	
Monthly	6	4.4	
Yearly	3	2.2	
As Necessary	45	33.1	
Never	36	26.5	
Years of Participation in NAERLS activities			
1-2	4	2.9	
3-4	60	44.1	4.5
Above 4	72	53	

Source: Field Survey, 2021

The mean household size (Table 2) was found to be 8 people with only 16.2% having annual farm income of above ₦60,000. Notably, the frequency of visits from NAERLS adopted village facilitators was occasional as indicated by 33.8% of the respondents, while most of the respondents (53%) have been participating in the NAERLS adopted village activities for more

than 4 years. Suffice it to note that the adopted village activities are a driving engine for livelihood diversification and development in the rural areas as reported by Oduehie *et al.* (2018). They attested that all the beneficiaries of NAERLS adopted village project have received several interventions and linkages with produce markets in Abia State, Nigeria.

Level of Participation in the Past One Year

As presented in Table 3, the activity most participated by the respondents in the past one year was training on Good Agricultural Practices (GAP), as indicated by the mean output of 1.4 which is higher than the cut-off mark of 1.0. In their findings, Sennuga *et al.* (2020) reported the majority of the farmers (adopted village participants) in Northern Nigeria considered extension officers' from NAERLS, as their main source of information on a range of GAPs. Followed by linkage with input agencies ($\bar{x}$ =1.2), that is, women were linked to input agencies to obtain inputs at cheaper rates and invariably reducing their cost of production. The finding thus agrees with the result of Oduehie *et al.* (2018). From the result below, we can conclusively say that there has been not much participation in the activities of adopted village in the past one year.

Table 3: Respondents' level of participation in NAERLS adopted village activities in the past one year

Activities	***Total score**	**Mean**
Linkage with produce market	5	0.03
Linkage with input agencies	164	1.2
Linkage with loan acquisition institutes	0	0
Training on use of pesticides and herbicides	129	1.0
Good agricultural practices (GAP)	202	1.4
Training on use of tractors and other farm implements	43	0.3
Sheep husbandry training	30	0.2
Goat husbandry training	48	0.4
Poultry husbandry training	65	0.5
provision of insecticides and herbicides	43	0.3
provision of fertilizers	21	0.2
Provision of improved seeds	38	0.3
Provision of livestock drugs	22	0.2

* Multiple responses
Source: Field Survey, 2021

Effectiveness of NAERLS Adopted Village Activities on Women's Livelihood

Table 4 reveals that NAERLS intervention in adopted villages has a positive effect on women's livelihood, income and a way out of poverty ($\bar{x}$ = 2.1). Furthermore, improved crop harvest had a mean of 2.0, that is to say the participants of the adopted village activities have higher output which might have resulted in higher socio-economic and consequently improved livelihood.

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Table 4: Respondents' according to the effectiveness of NAERLS adopted village activities on their livelihood *

Activities	*Total score	Mean
Access to improved agricultural technologies	37	0.3
Access to loan	0	0
Guaranteed market for my produce	43	0.3
New skills to improve my standard of living	170	1.3
Access to farm inputs at cheaper rates	48	0.4
Increase in my annual income	287	2.1
Better prices for my farm produce	193	1.4
Improved crop harvest from my farm	266	2.0

* Multiple responses
Source: Field Survey, 2021

Constraints to participation in the Adopted Village activities

As shown in Table 5, the most encountered constraints by women during participation in the NAERLS adopted village project are lack of transport to training areas ($\bar{x} = 1.3$). This might be because most of the women are rural poor with meagre income, thus any extra expense puts a strain on the family income. Followed closely is their inability to leave their children unattended ($\bar{x} = 1.2$). Onwutuebe (2019) averred that woman have multiple roles; being responsible not only for food production and processing but also care of independents. Thus, family care obligations often mean that women's time commands a low return compared with that of men. Poor practical demonstration ($\bar{x} = 1.0$) was also a major constraint among the women. The ability to communicate effectively is one of the most valued skills in extension delivery.

Table 5: Distribution of respondents on constraints

Constraints	*Total score	Mean
Lack of appropriate training materials	89	1.0
Insufficient number of extension agents	50	0.6
Poor practical demonstration	88	1.0
Inability to leave your children unattended	106	1.2
Restricted mobility due to cultural reasons	20	0.2
Lack of money for transport to training areas	117	1.3
Lack of time due to domestic and household workload	54	0.6
Laws and customs that impede women's access to land	0	0
Poor leadership	44	0.5
Lack of access to information	61	0.7
Insufficient number of female extension agents	78	0.9

* Multiple responses
Source: Field Survey, 2021

As presented in Table 5, the extensionist has not only to decide on the best practical approach, but also how to effectively demonstrate good agricultural practices. However, Issa *et al.* (2010) and Akinnagbe (2018) identified weak agricultural extension as a major constraint to practical agricultural demonstration and development. The lack of appropriate training materials (mean output of 1.0) is closely related with poor practical demonstration as this can be attributed to the poor funding of the agricultural extension in Nigeria which is mainly public sector driven. Mani and Mani (2020) reported that the agricultural extension system is plagued

grossly with inadequate and untimely funding. Meanwhile, the least encountered problem is laws and customs that impede women's access land ($\bar{x} = 0$).

CONCLUSION AND RECOMMENDATIONS

In conclusion, the adopted villages of NAERLS have had a positive effect on women's income by improving their income status and livelihood. However, poor rural infrastructure and gender roles affect their full participation. Findings from this study thus suggests that better timing of agricultural training to suit women's' window of opportunities is of paramount importance. Policy implications of this study for the lawmakers include:

1. The need to further financing of the agricultural extension vis a vis adopted village activities.
2. Government should provide more rural infrastructure such as roads and transportation system that can enhance extension accessibility of the rural woman.

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