The Adopted Village Project and Farm Income of Beneficiary Households in Kaduna State, Nigeria

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ABSTRACT About three years into the Adopted Village Project introduced by National Agricultural Extension and Research Liaison Services (NAERLS) in 2009, this study assessed the extent to which the project has improved the farm income and livelihood status of beneficiaries in the study area. Data were collected by interview schedule using a structured questionnaire, which was analysed using descriptive and Z-test statistics. The result shows that, about 89% of the project beneficiaries had between 1 - 8 extension contacts in 2011 cropping season, while non-beneficiaries had no contact with extension agents during the period. The study also revealed that the average income per hectare generated and the average value of assets owned by beneficiaries from the 2011 farming are statistically significant. This implies that the project intervention has significant impact on the income generating capacity of the beneficiaries of the project as well as on acquisition of assets. The study recommended that the NAERLS should intensify its efforts in the pilot villages and scale out its adopted village projects to other parts of the State. Also, policy makers, local government authorities and rural development experts should adopt this model in their programme planning and poverty alleviation initiatives.

INTRODUCTION

The United Nation General Assembly in 2000 has tagged the development goals agreed upon at various international conferences and world summits during the 90s as the "Millennium Development Goals" (MDGs), with reducing extreme poverty and hunger by half by the year 2015 as the first among the eight point targets (Vincent 2006). The importance of rural poverty is underscored by the fact that it accounts for nearly 63% of poverty worldwide, reaching 90% in some countries like Bangladesh and between 65 and 90% in sub-Saharan Africa (Etim and Edet 2007). In the early 1960s-80s, Nigeria was largely self-sufficient in food production. Agriculture's contribution to the Gross Domestic product (GDP) has remained stable at between 30 and 42%, employing about 65% of the labour force in Nigeria (Emeka 2007). However, there has been a gradual decline in agriculture's contributions to the nation's economy (Manyong et al. 2005) and household food security and income from agriculture has been threatened. The major reason for this was largely due to rise in crude oil revenue in the early 1970s. Presently, less than 50% of the Nigeria's cultivable agricultural land is under cultivation and are cultivated by smallholder and traditional farmers who use rudimentary production techniques, with resultant low yields (Olajide et al. 2012). The smallholder farmers are constrained by many problems including those of poor access to modern inputs and credit, poor infrastructure, inadequate access to markets, land and environmental degradation, and inadequate research and extension services. The inability to capture the financial services requirements of farmers and agribusiness owners who constitute about 70 percent of the population is inclusive (Lawal 2011) and the inaccessibility of the smallholder farmers especially in rural areas to improved technologies emanating from the National Agricultural Research Institutes (NARIs) (World Bank 2004).

However, in addressing the problem of widespread rural poverty, 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 (ARCN 2011). The Agricultural Research Council of Nigeria (ARCN), following the collapse of the NARP, requested the NARIs to revive the adopted village, culminating into the take off of the adopted village project in 2009.

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The NAERLS has been working in some selected sites in the 5 agro-ecological zones of Nigeria. In the North West zone, the sites are located in Kaduna and Katsina States. The aim of the adopted village project is to improve the economic and livelihood status of the beneficiary households within the villages. This study is aimed at assessing the effect of the project on the farm income of beneficiaries with a view of using it as an adoptable model for poverty reduction among rural households in the North West zone of Nigeria. Specifically, the study sought to identify (i) the extension interventions which are introduced to the beneficiaries of the project to improve their farm income and (ii) determine the effect of the interventions on the farm income of the beneficiary households in the villages.

The Adopted Villages Project Concept

Adopted village concept is an extension model whereby villages with potential impact (that is, village where new ideas have been introduced in the past and households within the villages are found to be receptive and willing to adopt the new technology) are selected to be developed in an integrated manner. This includes economic development, infrastructure development and other aspects of human development such as education, health, drinking water supply etc. In other words, it is a multidisciplinary approach involving any willing Government/Non-Governmental Agencies such as Research Institutes, Universities, Farmers' Clubs, Individual Rural Volunteers, Cooperatives and Bank Branches (Atala and Hassan 2012). The main aim of the adopted village model is to encourage large-scale adoption of improved technologies to empower resource poor farmers economically, create job opportunities and ensure food security. Specifically, the adopted villages' project is to:
• create awareness in the villages and build people's organizations/groups for various developmental activities through workshops and meetings;
• facilitate convergence/integration of various programs of State, Local Governments and other agencies in the villages;
• ensure socio-economic and livelihood advancement with enhanced credit support and financial inclusion of all families in the villages;

• identify capacity building needs of the villagers;
• assist in infrastructure development in the villages through participation of people/local institutions;
• protect forests and preserve the village ecosystem and conserve soil-health and other natural resources; and
• monitor progress of implementation of the project.

In Nigeria, the concept of adopted village was initiated to facilitate the trial of new research findings by scientists under the farmers' environmental conditions. The scheme has the added advantages of involving the farmers in the trial either as observers, in the case of researchers' managed, or executors in the case of farmers' managed trials. The involvement of farmers will in turn speed up the rate of adoption of such technologies by neighbouring farmers, as the trial also serve as demonstration plot.

RESEARCH METHODS

The Study Area

The study was conducted in NAERLS adopted villages in Giwa and Sabo Gari Local Government Areas of Kaduna State. Giwa Local Government has a projected population of 332,255 people, using a population growth rate of 3.2% per annum (National Population Commission - NPC 2006). The vegetation of the area is mostly grasses and shrubs. Some of the crops grown in the area include sorghum, groundnut, cowpea, tomatoes, pepper and sugar cane. Similarly, Sabon Gari Local Government has a projected population of 734,391 people, based on 2006 population census (NPC 2006). There is also a predominance of grasses and browse shrubs in the area. The major crops cultivated in the area include sorghum, millet, cowpea, rice, groundnut, soybeans, cotton and vegetables.

Agriculture forms the principal means of livelihood for more than 75% of the working population in both villages. Livestock keeping is a common activity in most households in the area, ranging from poultry, cattle, goats and sheep. Prominent among the traditional arts engaged by the men are: pottery, blacksmithing and leather work. The women are engaged in processing of farm produce as well as handicraft and trading. Islam is the predominant religion practiced by

over 90% of the population in both villages. The villagers are mainly Hausa/Fulani, living in traditional polygamous family settings. There is also the presence of other minority ethnic groups in both villages (NPC 2006; Krosch 2010).

Sampling, Data Collection and Analytical Technique

Data for the study were collected by interview schedule from a total of 268 beneficiary and non-beneficiaries households using a structured questionnaire from respondents in *Nassarawan-Buhari* in Giwa Local Government Area and *Sakadadi* in Sabon Gari Local Government Area, which are the two NAERLS adopted villages purposively selected for the study. To allow for equal representative across gender, forty per cent of the male and female beneficiaries were randomly selected from each village, to get a total of 134 respondents. A control group of 134 non-beneficiaries of the project were also randomly selected from two nearby villages (*Yakadawa* and *Tsugugi* in Giwa and Sabo Gari LGAs respectively). To complement the primary data, additional data were collected from secondary sources, such as the official reports from NAERLS and Local Government Areas offices. Information collected are on frequency of contact with extension agents, the various interventions introduced by the project to the beneficiaries, income levels and assets generated as a result of their involvement in the project. Data collected from respondents were analysed, using descriptive and z-test statistics.

RESULTS AND DISCUSSION

Level of Extension Contact

Adesope et al. (2010) have noted that visit or contact with extension agents provides opportunity for transfer of skill, knowledge and information which facilitate adoption. The distribution of beneficiaries according to the number of extension contact in the 2011 cropping season is presented in Table 1.

Participation in projects brings the beneficiaries in contact with extension agents, who provide adequate information on improved technologies. Table 1 revealed that all the beneficiaries had contact with extension agents in the 2011 cropping season. About 89% of the beneficia-

Table 1: Distribution of beneficiaries and non-beneficiaries by extension contact

Extension contact (times)	No. of benefi-ciaries	%	No. of non-bene-ficiaries	%
0	0	0	127	95
1 - 4	57	43	7	5
5 - 8	62	46	0	0
9 - 12	11	8	0	0
13 - 16	4	3	0	0
Total	134	100	134	100

Source: Field survey 2011

ries had between 1 - 8 extension contacts, while about 11% had between 9 - 16 extension contacts. Majority (95%) of the non-beneficiaries reportedly had no extension contacts.

Extension Interventions Introduced to Beneficiaries of the Project

In this section the distribution of beneficiaries of the adopted village project according to the extension interventions introduced are presented. The distribution of the beneficiaries according to the facilitative supports provided is presented in Table 2.

Table 2: Distribution of beneficiaries according to facilitative support provided in 2011

Facilitation support	No of benefi-ciaries	Per-cent-age
Linkage with Ahmadu Bello University Microfinance Bank	7	5
Linkage with Nigerian Agricultural Cooperatives and Rural Development Bank	24	18
Linkage with produce market	30	22
Linkage with input agencies	31	23
Participation in joint field days	30	22
Participation in farmer exchange visits	18	13
Total	140[*]	100

[*] Multiple responses: Total beneficiary greater than 134.
Source: Field survey 2011

In Table 2, the beneficiaries were linked with Ahmadu Bello University Micro-Finance Bank, but only about 5% of the project beneficiaries benefitted from the agricultural loan. Only about 18% of the project beneficiaries got their agricultural loans from the National Agricultural Cooperative and Rural Development Bank (NACRDB). About 23% of the beneficiaries

were linked with input agencies like the Premier Seeds, Golden Fertilizer (Flour Mills Nigeria Plc), etc. Linkage to the input market/agencies has allow the of the project beneficiary to have more access to inputs and to buy them at cheaper rates. About 22% of the project beneficiaries were linked with prospective buyers, for example the Grand Cereals Ltd., Jos, this has allowed the project beneficiary to have a guaranteed market and get better price for their farm produce. Similarly, about 22% of the project beneficiaries participated in joint field days while about 13% had farmers exchange visits with other beneficiaries of the project. These interventions allow for interactions with other farmers and thus provide opportunities for improving knowledge and information sharing. The distribution of the beneficiaries according to training (capacity building) attended in 2011 is presented in Table 3.

Table 3: Distribution of beneficiaries according to trainings (capacity building) attended

Training (capacity building)	No of benefi- ciaries	Per- cent- age
Training on soap making	86	64
Training on pomade (body cream) making	87	65
Training on spice making	58	43
Training on book (farm record) keeping	38	28
Training on opening and running bank accounts	29	21
Training on home economics and management	32	24
Training on double row maize production	30	22
Training on maximum density rice production	33	25
Training on cassava rapid multiplication	19	14
Training on use of pesticides	44	33
Training on fertiliser application	12	9
Total	468*	

* Multiple responses: Total beneficiary great than 134.
Source: Field survey 2011

According to Borode (2011), pomade (body cream) and soap making are major source of income for most women empowerment groups in Nigeria. Also, ILO (2009) revealed that about 66% of the women in the Capacity Building for Women's Cooperative Entrepreneurship Project in Swaziland received trainings on petroleum jelly ointment production. This result presented in Table 3 revealed that about 64% of the project beneficiaries were taught how to make pomade (body cream) and soap, and about 43% participated in trainings on making spices. Pomade

(body cream), soap and spices making are the major income generation interventions for the women in the adopted village project and so, a higher percentage of the beneficiaries were involved in them.

Other capacity building interventions introduced to the beneficiaries includes book keeping (farm records), opening and running of bank accounts, home economics and management and general farming activities. Only about 8% of the beneficiaries participated in training on fertilizer application. This may not be unconnected with the fact many of the project beneficiaries have experience in fertiliser application and may therefore needs no further training. The distribution of the beneficiaries according to input support provided is presented in Table 4.

Table 4: Distribution of beneficiaries according to input support provided

Input support	No of benefi- ciaries	Per- cent- age
Provision of fertiliser	22	16
Provision of insecticides and herbicides	52	39
Provision of improved seeds (maize, cowpea, etc.)	42	31
Provision of yam and cassava cuttings	23	17
Provision of oil palm hybrid seeds	4	3
Provision of infrastructures (boreholes, culverts)	6	5
Total	149*	

* Multiple responses: Total beneficiary greater than 134.
Source: Field survey 2011

According to Adeola et al. (2008) a significant increase was noted in the productivity level of the beneficiaries of the federal government special rice programme on rice yields in Oyo State of Nigeria, when they are supplied with farm inputs. It is well known among farmers that the yields of certain crops like cowpea are generally almost zero without the use of insecticides. Herbicides also help to reduce drudgery of labour. About 39% of the project beneficiaries reported receiving insecticides and herbicides for their farming activities. Also, about 31% of the beneficiaries were provided with improved seeds, particularly maize, sorghum and cowpea, and to a lesser extent yam and cassava cuttings (17%) and oil palm hybrid seeds (3%). This is expected to have a multiplier effect on their farm output and consequently improved livelihood and farm income.

Effect of the Interventions on the Beneficiaries' Farm Income

The effect of the intervention provided to the beneficiaries of the adopted village project on their farm income is presented in Table 5.

Table 5: Distribution of beneficiaries and non-beneficiaries by farm income

Farm income (N)	No. of benefi- ciaries	%	No. of non- benefi- ciaries	%
<300,000	92	69	127	95
300,001-600,000	10	8	7	5
600,001-900,000	11	8	0	0
900,001-1,200,000	4	3	0	0
1,200,001-1,500,000	9	7	0	0
>1,500,000	8	6		
Total	134	100	134	100

Note: ($1= ₦ 156)
Source: Field survey 2011

Table 5 shows that, about 69% of the project beneficiaries and 78% of the non-beneficiaries realised less than ₦300, 000 in the 2011 cropping season. Only about 3% of the non-beneficiaries and 16% of the project beneficiaries realised greater than ₦900, 000. In other words, more of the beneficiaries' income generating capacity has been improved, implying that the NAERLS adopted village project has an impact on the income generating capacity of the project beneficiaries.

Table 6 shows that the beneficiaries of the adopted village project acquired and own more assets than that the non-beneficiaries. However, in other to examine the impact of the project interventions on the income and assets of the beneficiaries, a Z-test statistical analysis was used to determine if there if any statistically significant difference between the incomes of beneficiary and non-beneficiary households.

Table 6: Distribution of beneficiaries and non-beneficiaries by assets acquired in 2011

Assets	No. of benefi- ciaries	%	No. of non- benefi- ciaries	%
Mobile phones	70	52	52	39
Land	80	60	67	50
Radio	88	66	76	57
Television	53	40	32	24
Motorcycle	40	30	27	20
Bicycle	30	22	12	9
Motor car	3	2	1	1
Bus/lorry	3	2	0	0
Tractors	2	2	1	1
Ox-drawn implements	9	8	2	2
Wheelbarrow	16	12	7	5
Others (hoes, cutlass etc.)	207	154	167	125
Total	601		444	

* Multiple responses: Total beneficiary great than 134.
Source: Field survey 2011

The effect of the NAERLS adopted village project interventions on farm income and assets acquisition of the beneficiaries of the project in the study area is presented in Table 7. The result indicates that the average income of the beneficiaries of the project was ₦210, 214, while that of the non-beneficiaries was ₦95, 675. The minimum and maximum farm income project beneficiaries were ₦1, 680 and ₦2, 510,000 respectively, while those of non-beneficiaries were ₦240 and ₦1, 227,500 respectively. The Z-test was used to test if there is any statistically significant difference between the income of the beneficiaries and non-beneficiaries. The Z-value of 2.59 shows a statistically significant difference at 5% level of probability between the income of project beneficiaries and non-beneficiaries. This implies that the interventions have a significant effect on the income of the beneficiaries of the project.

The results also shows that the average value of assets (such as lands, motorcycles, ox-drawn

Table 7: The result of the Z-test of the effect of project interventions on beneficiaries' income

Variables	Min.	Max.	Average	Standard deviation	Coefficient of variation	Z- value
Farm Income (₦)						
Beneficiaries	1680	2,510,000	210,214.30	462,390.80	3,450.68	2.59*
Non-beneficiaries	240	1,227,500	95,675.45	194,781.00	1,453.59	
Value of Assets Owned (₦)						
Beneficiaries	300	585,750	18306.09	51,263.84	382.56	5.59**
Non-beneficiaries	300	315,700	9396.81	37,939.46	283.13	

Note: ** and * denote statistical significance at the 1%, and 5% probability levels, respectively

implements, mobile phones, radios etc.) owned by the beneficiaries was ₦18,306, and this is higher than that of non-beneficiaries of ₦9,397. The minimum and maximum values of assets owned by beneficiaries were ₦300 and ₦585, 750 respectively, while those of non-beneficiaries were ₦300 and ₦315, 700 respectively. The Z-test was used to test if there is any statistically significant difference between the value of assets of the beneficiaries and non-beneficiaries. The Z-value of 5.59 shows a statistically significant difference at 1% level of probability between the value of assets of project beneficiaries and non-beneficiaries. This is indicative of improved socio-economic welfare among the beneficiaries as a result of the interventions introduced to them.

CONCLUSION

This study revealed that the adopted village project has improved the extension-rural household linkages, enhanced the participants' capacity and improved their income within the community. The Z-test result shows that the interventions have a statistically significant effect on the beneficiaries' farm income as well as an improvement in their socio-economic welfare (asset acquisition).

RECOMMENDATIONS

The study recommended that the NAERLS should intensify its efforts in the pilot villages and scale out its adopted village projects to other parts of the State and consequently other States in Nigeria will follow their lead. Also, policy makers, local government authorities and rural development experts are encouraged to adopt this model in their programme planning and poverty alleviation initiatives.

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