

**Empoderando as mulheres agrícolas através do modelo de fortalecimento da vida na  
Nigéria oriental**

**Empowering women farmers through livelihood strengthening model in eastern Nigeria**

**Empoderando a las mujeres agricultoras a través del modelo de fortalecimiento de la  
vida en Nigeria oriental**

Recebido: 13/08/2019 | Revisado: 02/09/2019 | Aceito: 07/09/2019 | Publicado: 04/10/2019

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**Resumo**

A melhoria nas capitais de subsistência de mulheres vulneráveis agricultoras tem sido uma preocupação nos países em desenvolvimento. Governos de todo o mundo, particularmente nos países em desenvolvimento, tentam várias políticas e modelos para aumentar a produtividade dessas mulheres vulneráveis, elas fazem isso para protegê-las contra choques e perdas, considerando que a produção de alimentos rurais contribui significativamente para a segurança alimentar nacional. É o caso da Nigéria, onde o Modelo de Aldeia Adotada (AVM) foi iniciado em 2009. O objetivo do estudo inclui, entre outros, proteger, melhorar e sustentar a produção de alimentos na Nigéria, capacitando as mulheres rurais que cultivam arroz. A AVM foi iniciada e as mulheres agricultoras forneceram informações, equipamentos agrícolas, treinamento, mudas e fertilizantes subsidiados. Questionários estruturados e entrevistas foram os instrumentos básicos aplicados na coleta de dados. A metodologia foi guiada por teorias da estrutura de meios de vida sustentáveis. Questionário estruturado foi usado para extrair as informações desejadas das mulheres agricultoras. Os dados foram analisados com o spss versão 25, interpretados e apresentados para consumo público. O estudo constatou que a AVM foi apresentada às mulheres agricultoras no momento certo, quando as capitais de rendimento e subsistência das mulheres agricultoras de arroz eram muito baixas.

**Palavras-chave:** Meios de subsistência; Arroz; Mulheres agricultoras; Modelo; Agricultura

**Abstract**

Improvement in livelihood capitals of vulnerable women farmers has been a concern in the developing countries. Governments around the world particularly in the developing countries try various policies and models to enhance the productivity of these vulnerable women farmers, they do this to protect them against shocks and losses considering that rural food production contribute significantly to national food security. Such is the case in Nigeria, where Adopted Village Model (AVM) was initiated in 2009. The objective of the study includes but not limited to protect, improve and sustain food production in Nigeria through capacitating the rural women rice farmers. AVM was initiated and women farmers were provided information, farm equipment, training, seedlings and subsidized fertilizers. Structured questionnaires and interviews were the basic instruments applied in the data collection. The methodology was guided by sustainable livelihood framework theories. Structured questionnaire was used to extract desired information from the women farmers. The data was analysed with spss version 25, interpreted and presented for public consumption. The study found that AVM was introduced to the women farmers at the right time when yield and livelihood capitals of the rice women farmers were very low.

**Keywords:** Livelihood; Rice; Women farmers; Model; Agriculture

### **Resumen**

La mejora en los capitales de subsistencia de las mujeres campesinas vulnerables ha sido una preocupación en los países en desarrollo. Los gobiernos de todo el mundo, particularmente en los países en desarrollo, prueban diversas políticas y modelos para mejorar la productividad de estas mujeres agricultoras vulnerables, lo hacen para protegerlas de los golpes y las pérdidas, teniendo en cuenta que la producción de alimentos en el medio rural contribuye significativamente a la seguridad alimentaria nacional. Tal es el caso de Nigeria, donde el Modelo de aldea adoptada (AVM) se inició en 2009. El objetivo del estudio incluye, entre otros, proteger, mejorar y mantener la producción de alimentos en Nigeria mediante la capacitación de las mujeres campesinas de arroz. Se inició AVM y las mujeres agricultoras proporcionaron información, equipo agrícola, capacitación, plántulas y fertilizantes subsidiados. Cuestionarios estructurados y entrevistas fueron los instrumentos básicos aplicados en la recopilación de datos. La metodología se guió por las teorías del marco de medios de vida sostenibles. Se utilizó un cuestionario estructurado para extraer la información deseada de las mujeres agricultoras. Los datos fueron analizados con spss versión 25, interpretados y presentados para consumo público. El estudio descubrió que AVM se presentó

a las mujeres agricultoras en el momento adecuado cuando el rendimiento y las capitales de sustento de las mujeres productoras de arroz eran muy bajas.

**Palabras clave:** Sustento; Arroz; Mujeres agricultoras; Modelo; Agricultura

## 1. Introduction

In the world of rapid population growth, migration and globalization, agriculture serves as core sector to sustain feeding and consumption patterns of the world's population. In rural Africa and most parts of Asian countries like, India, Bangladesh, Malawi, Ethiopia, Kenya, Taiwan, Sri Lanka and Nigeria, majority of the population depend fully on agriculture and in most cases practice subsistent agricultural production (Akinola et.al, 2013; FAO, 2013).

As a result, agricultural production and activities in Nigeria has witnessed great attention recently because the sector is also a major source of food supply and foreign exchange. The sector employs about 60 to 70 percent of the Nigerian labour force, at the same time serves as a potential alternative to diversifying the Nigerian economy. Nigeria with massive arable land, favourable weather conditions and huge population advantage that have the potential to produce enough food for domestic consumption. However, less than 50% of the agricultural land is under cultivation and are cultivated by small land owners and traditional farmer's who use rudimentary production techniques leading to low yields (Olajide et.al, 2012).

Therefore, the quest to improve livelihood through agricultural activities has resulted in adoption of various agricultural strategies, policies, programmes in Nigeria. A model by Federal Ministry of Agriculture and Rural Development (FMARD) recently introduced in Abia State is the Adopted Village Model (AVM). The model target specific set of women farmers to improve their livelihood. AVM is seen as a paradigm shift from conventional agricultural activities particularly in rice farming and rice production in Abia State (Ogunsumi, 2013; Akinola et.al, 2013). Increasing population growth in Nigeria which is currently estimated at 190million (Nigeria Bureau of Statistics, 2019), has pushed up rice consumption to 6.5 percent while the domestic production growth rate is estimated at 3.7 percent (Akintayo, 2011). Rice yields in Nigeria since the late 1980s has witness low productions, averaging about 1.8 tons of paddy rice per hectare, compared to national potential average of 3 tons per hectare for upland system and 5 tons per hectare for the lowland system (Chigozie, 2018). In 2002, Nigeria became the six largest rice importer in the

world (Yusuf et.al. 2009) and by 2009-2012, Nigeria became the second largest rice importer after China (FAO, 2013; Akor, 2014).

AVM as a model on rice farming and production in the Abia State, is also important to poverty alleviation, income generation and yields of rice, since rice is the most common cereal consumed within the State and Nigeria at large. Consequently, if the Sustainable Development Goal (SDGs) to alleviate poverty by 2030 is to be realized, then supporting rural women rice farmer and rice production is an important step to improving the livelihood of the most vulnerable women rice farmer's (Chigozie, 2018). Sequel to this, agriculture has been identified by Federal Government of Nigeria (FGN) as the major source of food supply, employment, raw material and means of livelihood to majority of the population. Jalaludeen (2012), stated that Africa produces an estimated 15.08 million tons of paddy rice on a scale of 10.23 million hectare which is about 3.3 to 6.11 percent of the world's total rice production and rice areas. This estimate has over the last two decades seen steady growth rate from 7 – 8tons production in the 1980s to 11.5tons in the 1990s then 27tons per capita per year within the period 2001 – 2005 and 491, 603 metric tons in 2010.

Paramount contributing factors to this steady but continuous growth in rice production include but not the least- population growth, consumer and individual taste and preferences, urbanization and migration. Arguably, people in the cities consume more rice than those in the rural areas, hence the high concentration of rice consumption in cities. It is therefore necessary to determine the impact of AVM on livelihood capitals of the rural women rice farmers. This is because estimating the changes in women rice farmers adoption of AVM and the impact of the adoption on their livelihood may not provide sufficient insights, as such, constructing AVM model around some associated livelihood capitals of the women farmers with respect to the services provided by AVM becomes critical to be effective and a sustainable livelihood prediction model.

The specific objectives of the paper include:

- a. To identify various variables necessary to facilitate improvement in livelihood capitals of the rural women rice farmers.
- b. Evaluate the association between AVM services and livelihood capitals of the rural women farmers.
- c. Make policy recommendations based on the research findings.

## **Hypothesis**

H<sub>0</sub>: There is no significant association between AVM services and livelihood capitals of the women rice farmers.

## 2. Methodology

The research was conducted in Abia State, Nigeria. Purposive sampling technique was used in the selection of the two Local Government Areas, autonomous communities while simple random sampling was used to select the women farmers. The local government areas selected were Umuahia South zone and Ohafia zone.

A sample size of 231 women rice farmers constituted the sample population of the study. The respondents were zone into two (2) that is, Umuahia zone with one hundred and eleven (111) respondents, Ohafia zone with one hundred and twenty (120) respondents. All the respondents were rural women rice farmers in the various villages. They were sampled based on their knowledge and experience on rice farming in the State. For the purposes of this study, descriptive and inferential statistics were used. Descriptive statistics used include tables, percentages and frequencies. The economic analyses adopted in this paper followed that of Ezeh (2006), in some functional forms of multi regression were analyzed. It's specified as follows:

$$L = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, \dots e)$$

Where L = livelihood capitals of the women farmers

X<sub>1</sub> = Farming experience in years

X<sub>2</sub> = Household composition

X<sub>3</sub> = Gender

X<sub>4</sub> = Income

X<sub>5</sub> = Yield

X<sub>6</sub> = AVM training

X<sub>7</sub> = Education level

X<sub>8</sub> = Age

e = error term

For this study anova linear regression model was chosen for predictive equation of AVM based on the number of significant variables that are correctly signed to the capitals with values significant to 0.05.

## Result and Discussion

Table 1 shows that 34.9% of the women rice farmers experiences in farming ranges between 11 - 20 years, closely followed by (31.4%) of respondents with 1 – 10 years experiences. This implies that the women in the study area had significant rice farming experiences required to be included in the study to design the model for rice production in Nigeria. Women rice farmers with greater years of farming experience are better positioned to make rational choice and decide among alternative farm inputs (Onwuka, 2005).

**Table 1: Distribution of respondents characteristics (n=231)**

<b>Experience by years</b>	<b>Frequency</b>	<b>Percentage</b>
1 - 10	72	31.4
11 - 20	80	34.9
21 - 30	60	26.2
31 - 40	17	7.4
<b>Households</b>		
Female Children Only	8	3.5
Male Children Only	15	6.5
Male and Female Children Only	208	90.0
<b>Gender</b>		
Male	70	30.3
Female	161	69.7
<b>Seasonal Income</b>		
Less than 100,000 naira income	35	15.9
100,000 - 300,000 naira income	119	54.1
300,001 - 600,000 naira income	45	20.5
600,001 - 900,000 naira income	12	5.5
900,001 - 1,200,000 naira income	9	4.1
<b>Yield</b>		
Less than 1 ton of rice	90	40.9
1 - 5 tons of rice	107	48.6
6 - 10 tons of rice	6	2.7
11 - 15 tons of rice	5	2.3
16 - 20 tons of rice	4	1.8
Above 20 tons of rice	8	3.6
<b>AVM Training</b>		

No	69	30.1
Yes	160	69.9
Education Level		
Other	3	1.3
Tertiary	56	24.2
Secondary	104	45.0
Primary	68	29.4
Age (Years)		
20 - 30	21	9.3
31 - 40	47	20.7
41 - 50	69	30.4
51 - 60	72	31.7
Above 60	18	7.9

Source: Authors construct

Table 1 also show that household composition of the women farmers with male and female children constituted 90% of the respondents. Hence Eze (2006), argues that large household sizes supply the much-needed labour for farm work as well as serve as a cushion against social insecurity in terms of old age. Nwite et.al (2008), found that there is a correlation between rural women rice farming experience and adoption of technologies which leads to improved management practices and substantially proliferate increasing yield in rice production. The results show that majority (67.7%) of the respondents are female rice farmers with 54.1% seasonal income. According to Nwankwo, Peters and Bokelmann (2009), found that in Nigeria, women are beginning to engage more in agricultural activities and production. However, low income status has serious deleterious implications on their farm investments and agricultural productivity (Ezeh, 2006).

Furthermore, 48.6% of the respondents had sustainable seasonal yield of 1 – 5 tons of paddy rice harvest. According to Marco (2015), the production growth rate in sub-Saharan Africa increased from 3.2% per year before the rice crisis (2000–2007) to 8.4% per year after the rice crisis (2007–2012) and paddy rice production increased by 2.8 Million Tons (MT) from 2000 to 2007, and then accelerated, increasing by 4.7MT in the period 2007–2012. As indicated by the rural women rice farmers, 69.9%, were trained by AVM through the extension agents, women farmers cooperatives and other mediums such as the community engagement programmes, demonstrations and home visits. Adesope et.al (2010), and Akinola

et.al (2013), have noted that in Nigeria, women rice farmers contact with extension agents provides them with the opportunity for transfer of skill, knowledge and information which facilitate adoption.

Majority of the rural women rice farmers (45%) highest level of education is the secondary school. The literacy level among the women could be attributed to the seemingly positive effects of the free (Universal Basic education Scheme) and AVM skill trainings. Because the more literate the women, the more likely they are to adopt new ideas (Onuoha, 2006). While the age bracket of 51 – 60 years constituted the highest women with 31.7%. Nwaru et.al (2011), argues that declining age of women rice farmers decrease their cognitive power and exposes the them to risk bearing ability and innovativeness diminutives.

### Association between AVM and livelihood capitals

The result of regression analysis is shown in Table 2. It examined briefly, the individual characteristics of the aggregate livelihood variable equation. It shows that six out of the eight explanatory variables had significant association in the equation. They include farming experience ( $X_1$ ), Seasonal Income ( $X_4$ ), Yield ( $X_5$ ), AVM Training ( $X_6$ ), Education level ( $X_7$ ) and Age ( $X_8$ ).

Table 2: Regression

Source of input		Sum of Squares	Df	Mean Square	F	Sig.
$X_1$ Farming Experience	Between Groups	24.606	7	3.515	4.484	<b>.000</b>
	Within Groups	172.460	220	.784		
	Total	197.066	227			
$X_2$ Household Composition	Between Groups	2.184	7	.312	1.704	<b>.109</b>
	Within Groups	40.638	222	.183		
	Total	42.822	229			
$X_3$ Gender	Between Groups	2.431	7	.347	1.666	<b>.118</b>
	Within Groups	46.265	222	.208		
	Total	48.696	229			
$X_4$ Seasonal rice income	Between Groups	10.436	7	1.491	1.761	<b>.097</b>
	Within Groups	178.669	211	.847		
	Total	189.105	218			
$X_5$ Yield of Rice	Between Groups	29.592	7	4.227	3.690	<b>.001</b>
	Within Groups	241.732	211	1.146		
	Total	271.324	218			
$X_6$ AVM training	Between Groups	5.492	7	.785	2.025	<b>.053</b>
	Within Groups	85.258	220	.388		
	Total	90.750	227			
$X_7$ Education Level	Between Groups	11.197	7	1.600	2.873	<b>.007</b>
	Within Groups	123.590	222	.557		
	Total	134.787	229			
$X_8$ Women farmers Age	Between Groups	60.887	7	8.698	8.958	<b>.000</b>
	Within Groups	211.679	218	.971		
	Total	272.566	225			

Source: Authors construct



Farming experience of the rural women rice farmers show significant association in-line with AVM services with a mean square (3.515), F.stat (4.484) and Sig (.000). This implies that the rural women rice farmers previous experiences in rice farming is positive and strongly associated with the AVM services. Therefore, application of these services, example fertilizer usage and application was sensitive to the women farmers previous experience. An experienced woman farmer is more likely to have realized the importance of inorganic fertilizer and even where credit facilities are not available, such a woman rice farmer is more likely to have advantage of fertilizer consumption (Oji, 1997; Nwagbo and Achoja, 2001). Thus previous experience would sustain the rural women rice farmers' interest in the use of fertilizer, Eze et.al (2008).

Household composition assume a negative association with .109 sig level. This value shows that p-value ( $p > .109$ ). The negative association with the variable implies that small household are constrained when it comes to large fixed farm costs hence Abara and Singh (1993), argues that in the case of small households, large fixed costs constitute a constraint to technology adoption, particularly if the technology requires a substantial amount of initial set-up cost. The level of technology adoption varies differently amongst women farmers with varied household status.

Since rice farming is male dominated, the gender value exhibits negative association with .118. From the respondents, gender argument on rice farming is not contestable hence the negative value, however, it does not mean that the negative sign limit the contribution of gender with respect to livelihood capitals. This implies that the male headed households are less poor or have higher tendency to adopt to innovation and technology in other to better their livelihoods than their female counterparts, (IFAD, 1992; Rakodi, 1999; UNDP, 2004).

Also, the seasonal income shows positive association with .097 sig level. This implies that as much as there are government policies and models such as AVM, the rural women rice farmers seasonal income would continue to improve. This would translate into better standard of living and general livelihood sustainability. Baributsa et.al (2014), found that in Africa, demand for the grain is often higher than the supply, which provides women farmers with the opportunity to earn additional income.

Yield of rice has been argued to have improved significantly since the adoption of AVM. This is shown on Table 2, with a .001 statistical significance and p-value ( $p < .001$ ). This means that with ideal soil treatment services, fertilizer application, regular extension consultation and other required farm skills as provider by AVM, rural women rice farmers

yield would continue to improve. According to FAO (2013), rice yield in Africa has improved significantly since early 2000s. This is contributed to increasing women participation in rice production and farming.

Arguably, AVM training exhibits positive association and significance as shown in Table 2 with a value of .053 statistics significance and p-value ( $p < .053$ ). Therefore, as much as AVM services are provided to the women farmers, their general livelihood capitals would continue to be improved and sustained. As such, Adesope et.al (2010), and Akinola et.al (2013), have noted that in Nigeria, because of women access to extension services and government support services, the benefit from the transfer of skills, knowledge and information which facilitate adoption of technology, innovation and improved farming practices.

The education level of the women farmers also show positive association with .007 significant level. This implies that education exposes the women farmers to information and therefore creates awareness, which is a very important stage in the adoption of innovation (Kenneth et.al, 2006). Paswel, Christopher and Barrett (2007), argues that the significant implication of education on the rural women farmers is evident through emphasis on management training and skills building.

Age of the women farmers also determine their level of adoption of agricultural initiatives, programmes and models such as AVM. In the Table 2, age of the women farmers exhibit a perfectly positive association with .000 statistics significance. This shows positive significant levels for adoption of agricultural innovation and technology (Paswel et.al, 2007).

### **Conclusion And Recommendation**

Rice farming in Nigeria has recently been hit hard by difficulties to access basic assistance, for example, access to financial, skill training and development, high cost of fertilizers, modern farm implements and processing facilities as well as transportation. As a result of these challenges, rice production in Nigeria has been the focus of the Federal Government. Over the years, Nigeria had depended on importation of rice to meet the domestic consumption. With increasing population, taste, and demand for rice, there was need to make provisions to encourage and improve the local production of rice. AVM is adopted when the demand for rice in Nigeria is crucial to the sustainability of the consumption and food security of the country. Empowering the rural women rice farmers at the rural areas with basic needs to improve their production would subsequently improve rice production and supplies to the cities. It bridged the importation gaps and ensured domestic food sufficiency, which is one of the aims of the promulgation of the model.

**Based on the findings, the study recommends the following:**

a. That more effort and resources should be incorporated in the sensitizing the young women to take up agriculture as a source of income earning, profession and livelihood path. Young women need to embrace agriculture as a serious employing and lucrative occupation. From the study, it shows that the older the women farmers the more they are receptive to adoption and interventions. This should not be the case since at young age, the women would be more energetic, full with vigour and are enterprising. Education and awareness creating is very important as they play significant role in helping the rural women.

b. Practical part of agriculture should be intensify in the education curriculum.

c. Agricultural initiatives and interventions should be more responsive and participatory, taking the form of bottom-up approach and ensuring that rural women farmers are properly mainstreamed in it. This requires good extension service, education and assurance to the rural women farmers that the intervention and initiatives will be to their benefit.

d. Partnership with the research institutes and relevant government agencies will ensure that the women farmers are up to date with necessary information that will enhance their agricultural productivities. Partnership will improve socio-economic and environmental associations between the women farmers, their productivities, government and relevant stakeholders.

Finally, adopting AVM in Nigeria is one of the ways by which the country responds to the global call for rural women empowerment. In Nigeria, agriculture is a major source of employment especially for women who constitute significant share of the population of farmers. Empowering them signifies building a nation that is able to produce enough food for its citizens and society. However, there is growing challenges on limitations of AVM with regards to including other crop farmers. How AVM would help to upscale and empower other rural women farmers remains to be seen. More studies need to be conducted to provide clarity and sustainability framework for these policies.

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