International Journal of Agricultural Science, Research and Technology in Extension and Education Systems (IJASRT in EESs)
Available online on: http://ijasrt.iau-shoushtar.ac.ir
ISSN: 2251-7588 Print
ISSN: 2251-7596 Online
2024: 14(2): 133-140

Received: 23 September 2023
Reviewed: 20 November 2023
Revised: 24 November 2023
Accepted: 26 November 2023

Determinants of Beneficiaries Level of Utilization of Value Chain Development Programme Services by Cassava Producers in Ebonyi State, Nigeria

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Abstract

The study analyzed the determinants of beneficiaries level of utilization of value chain development programme services by cassava producers in Ebonyi State, Nigeria. A multi-stage sampling procedure was used to select 130 cassava producers who were beneficiaries of the programme. Data were collected using a structured interview schedule to solicit information from the illiterate farmers. Percentage, standard deviation, mean scores, and regression analysis were used for data analysis and result presentation. Results reveal that 57.7% of the beneficiaries were male with a mean age of 38.5 years. Also, 60% of the beneficiaries were moderate users of cassava production services disseminated by the programme. The regression results show that years of farming experience (t=3.360, p =0.001), years spent to acquire education (t=2.948, p=0.004), and annual income (t=-3.354, p=0.001) significantly influenced the beneficiaries' level of utilization of cassava production services. The study recommends that the government and programme implementers should organize workshops and training programmes through extension agent for the farmers to help update their knowledge of production. The government and other relevant stakeholders should provide financial incentives to the beneficiaries to sustain and improve their level of utilization of the production services disseminated to minimize the cost of production and motivate them to produce.

Keywords: Determinants, Beneficiaries, Utilization, Cassava, Production Services

1. Introduction

Agricultural technology boosts food security and income of rural farmers. Agricultural technology transfer has driven rural development in many developing countries like Nigeria. In Nigeria, it is important in increasing agricultural productivity in rural farming communities where over 70% of the population engages in agriculture for their livelihood. However, there has been a decline in food productivity in the face of the ever-increasing human population and climate change impacts. Poor agricultural productivity and development have driven smallholder farmers and other stakeholders in agriculture into abject poverty and food insecurity (Mgendi et al., 2019). Agricultural technologies are several practices and tools employed in the field, including the utilization of hybrid crops, insecticides, artificial intelligence (AI), tractors, geographic positioning system (GPS), chemical fertilizers, greenhouse technology, and the application of other scientific knowledge in order to improve productivity (Lalitha et al., 2019).

The utilization of agricultural technology plays a significant role in enhancing agricultural productivity. As agricultural development becomes more reliant on technological advancements, the capacity and inclination of farmers to embrace novel technologies become crucial factors in fostering productivity, growth and structural transformation. These factors, in turn, directly impact the poverty reduction rate in rural areas. The degree to which farmers accept

and utilize these technologies has a crucial role in determining the influence of these technologies on productivity and rural development (Saidu et al., 2017). Farmers are associated with many socioeconomic factors that influence their decision whether to utilize or not a specific agricultural technology; such as education level, farming experience, age, gender, farm size, labor availability, and income availability according to the findings of Sennuga et al., (2020). In addition, the elements associated with technology's attributes, such as its relative benefit, compatibility, complexity, and trialability, affect their willingness to utilize agricultural technologies (Le Hoang Nguyen et al., 2023).

The Value Chain Development Programme targeted cassava and rice producers, processors, and marketers in Anambra, Ebonyi, Benue, Niger, Ogun, and Taraba pilot states. The programme's primary objective is to sustainably enhance the income and food security of underprivileged rural farmers engaged in the value chains of the staple crops mentioned above. In addition, the programme disseminated knowledge among producers on appropriate storage practices, enhanced accessibility to climatic information, and facilitated credit provision from various entities such as non-governmental organizations, government agencies, community-based organizations, and IFAD funding (IFAD, 2020). Determining cassava producers' socioeconomic status and how it influences their level of utilization of cassava production services disseminated by the Value Chain Development Programme is essential for better policy decisions by relevant stakeholders toward increased productivity and rural development.

Research indicates that farmers' attitudes toward utilizing a specific technology are closely associated with their socioeconomic characteristics. Farmers' understanding of any agricultural technology varies and can be influenced by their socioeconomic characteristics. According to the empirical search, there is limited or no information on the determinants of beneficiaries' level of utilization of Value Chain Development programme services by cassava producers in Ebonyi State, Nigeria. Although, Jirgi et al. (2018, 2019) conducted a research on the assessment of youth participation in cassava production under the Value Chain Development Programme in Bida local Government of Niger State, Nigeria and Economic analysis of Cassava processing under Value Chain Development Programme in Wushishi local government area of Niger State, Nigeria. There is need to determine the socioeconomic factors that influence the beneficiaries' level of utilization of the programme Services disseminated in the state for informed policy decision for similar programmes and to enhance sustainable cassava production and agricultural development in the state. Based on this empirical gap, this research was undertaken to examine the determinants of beneficiaries' level of utilization of Value Chain Development programme services by cassava producers in Ebonyi State, Nigeria. Specifically, the study identified the socioeconomic characteristics of the beneficiaries under the Value Chain Development Programme; ascertained the utilization of cassava production services disseminated by the programme; ascertained their level of utilization of cassava production services disseminated by the programme and determined the relationship between the beneficiaries socioeconomic characteristics and their level of utilization of cassava production services disseminated by the programme.

2. Materials and Methods

2.1 Study area

The study was carried out in Ebonyi State, Nigeria. Geographically, Ebonyi State is located in southeast Nigeria and lies approximately at longitudes 5o4' E and 6o45'E and latitude 7o3' N. The state has a land area of about 5,935 square kilometers (Umeh et al., 2020).

2.2 Sampling procedure and method of data collection

The population for the study comprised all registered cassava producers in the participating local government areas in Ebonyi State. A multi-stage sampling procedure was used to select 130 cassava producers who were beneficiaries of the program. In the first stage, three local government areas (L.G.A.) with producer cooperatives were randomly selected out of eight L.G.A.s participating in the programme in the state. In the second stage, 20% of registered cassava producer cooperatives were selected using proportionate sampling techniques from each of the three selected L.G.A.s. This gave 13 producer cooperatives out of 64 participating in the program. In the third stage, a random sampling technique was used to select ten members who are cassava producers from each of the selected producer cooperatives in each participating L.G.A. This gave rise to 130 cassava producers in the state, which constituted the sample size for the study. Data were collected using a structured interview schedule. With the help of other research assistants, the researcher administered the questionnaire, which captured the study's objectives. The content and face validity of the instrument were checked by the state professionals and Value Chain Development Programme facilitators to ensure that the instrument collected the relevant data it was meant to collect.

2.3 Measurement of variables and data analysis

The level of use of cassava production services disseminated by the programme was determined by asking the beneficiaries to tick 'yes' or 'no' against each of the 21 services listed that the programme noted to have disseminated to the beneficiaries across cassava production value chain. Then, each of the beneficiary's scores was added up and categorized into different levels of use based on the score. Beneficiaries with a score of zero (0) were categorized as non-users (0), (1–7) = low user, (8–14) = moderate user, and (15–21) = high user. Data were analyzed using percentage

count, standard deviation, mean scores, and regression analysis. The specific form of the regression model for cassava producers is shown below:

$$Y = b0 + b1X1 + b2X2 + b3X3 + b4X4 + \ldots\ldots\ldots\ldots b12X12 + e$$

Where,
Y= Beneficiaries level of use of cassava production services (number of services used by each beneficiary was added up to obtain a score for each beneficiary)
Y (dependent variable) = (sum of level use of services) while, X1-X11 (the independent variables)
X1=Age (years)
X2 = sex (male=1, female=0)
X3=marital status (dummy: married =1, not married = 0) (not married include: single, separated, divorced and widowed)
X4 = years spent in school (years)
X5=annual income from VCDP activities (naira)
X6 = total annual income from cassava production and other VCDP services (naira)
X7= years of farming experience (years)
X8= no of contact with extension agents (in the past one year)
X9= household size (number of persons)
X10= farm size (hectare)
X11= membership of organization (dummy: member =1, not a member=0)
b0= intercept, b1-b13=coefficients of regression and e= error term
IBM SPSS Statistics (SPSS version 22.0) software package was used for the analysis of the data.

3. Results and Discussion

3.1 Socio-economic characteristics of beneficiaries

Data revealed that 57.7% of the beneficiaries were male. This implied that cassava production in the state was dominated by men than women This is in line with the findings of Okoye et al. (2019), which reveal that most cassava producers in Ebonyi State were males.

Data indicated that the mean age of the beneficiaries was 38.5 years. This implied that the beneficiaries are relatively young and in their active, productive age. This agrees with the findings of Amusa et al. (2021), who suggest that a young farming population is potentially more productive, innovative, and adaptable to new agricultural technologies.

Data showed that 76.9% of the beneficiaries were married people. This implied the availability of affordable family labor for cassava production. This confirms with the findings of Akinpelu et al. (2021), who state that marriage provides a stable and secure environment for farming as it provides a dependable source of labor for agricultural production.

Data presented revealed that the mean household size was about seven persons. This implied that the beneficiaries had a large household, a source of affordable labor. This agrees with Adeoye et al. (2021), who opined that large rural household size is important as it forms a larger part of the family labor force for cassava production and reduces the cost of hiring labor.

Data presented showed that the beneficiaries mean years of farming experience were 8.7 years. This showed that beneficiaries have had long years of farming experience and would more likely understand and utilize cassava production services disseminated if they perceive them as compatible and have a relative advantage over previous practices. This confirms the findings of Zossou et al. (2020), who posited that farmers rely heavily on their personal experiences and fellow farmers to adopt agricultural technology.

Data presented revealed that the mean years spent in school was 8.66 years. This implied that the beneficiaries' are literate, possess some basic education, and can easily understand and use the program services disseminated. This supports the findings of Iyere-Freedom and Enwelu (2022), which posited a significant positive relationship between farmers' use of agricultural technologies and their level of education.

Data presented indicated that the mean farm size of the beneficiaries was 1.74 hectares, meaning that beneficiaries were smallholder cassava producers who generally cultivated less than 5 hectares of land. This agree with the study of Ibitola et al. (2019), which state that agriculture in Nigeria is dominated by smallholder producers, who constitute about 80% of the farming population and are collectively responsible for national food production across the 36 states in Nigeria.

Data indicated that the mean annual income of the beneficiaries was N267, 553.85, which implied that the beneficiaries still earned a poor income from cassava production. This is in line with the report of Egenti (2020), who

opined that over 100 million Nigerians live below the poverty line, and this manifest itself more in smallholder farmers who earn less than US$1.90 per day.

3.2 Cassava production services disseminated and used by the beneficiaries under the Value Chain Development Programme

Data in Table 1 indicated that 34.6% of beneficiaries utilized good record-keeping services disseminated to them. The low utilization of the service may be due to the rigorous nature of keeping an accurate farm record and the drudgery nature of farm work. This agrees with the findings of Omolehin et al. (2020), which reveal that record-keeping was among the technologies with a low farmer adoption rate.

Entries in Table 1 showed that 98.5% of the beneficiaries bagged their cassava tubers in 50kg per bag, which was the standard measurement they were trained in when selling their produce. The researcher observed that the utilization of this service increased their income. According to the findings of Kaunkid (2022), who state that using a weight scale mechanism, can correctly measure and record quantity, and this system can help farmers improve and manage their farms effectively.

Data presented in Table 1 revealed that 100% of the beneficiaries planted early between March and June and in line of 1m by 1m as they were trained, which favored high yield, reduced pest attack and large tuber development than their previous practice. This aligns with the findings of Ajeigbe et al. (2020), who opine that early planting is recommended to escape diseases and insect attacks in crop production in Nigeria.

Data in Table 1 indicate that 100%, 53.8%, and 10.8% of the beneficiaries utilized TME 419, TME 0581, and Pro-Vitamin A varieties in cultivation, respectively, as those varieties are high-yielding and diseases resistant than previous stem cuttings they were used to plant before the program intervention. This finding coincides with the findings of Kolapo A. and Kolapo A.J. (2021), who find that the adoption of an improved variety of cassava increase farmers' yield, income, and welfare outcomes.

Entries in Table 1 report that 90.0% of beneficiaries utilized the matching grant at a 50% discount rate provided by the program, which increased their productivity and income as they paid less on purchasing agro-inputs. The result assent with the findings of Taremwa et al. (2021), who reveal that productivity, was higher among farmers who accessed agricultural credit.

Results in Table 1 showed that 92.2% of beneficiaries used poultry organic manure as a sustainable agricultural practice while 56.9% used timely agro-input application. The high use of organic poultry manure by beneficiaries implied that they are now aware of the need for sustainable agriculture practices to reduce the impacts of climate change. This finding confirms the findings of Nwobodo et al. (2020), who posit a significant positive correlation between the knowledge level of farmers and their use of sustainable practices.

The data presented in Table 1 showed that 79.2% of the beneficiaries utilized weed management practices. The result implied that the beneficiaries understood the importance of keeping their farms free from weeds to avoid poor tuber development and diseases infestation. This finding confirms the findings of Ekeleme et al. (2021), who state that weed competition is the major biological stress affecting cassava production in smallholder farms in Nigeria, which leads to low yield.

The data presented in Table 1 revealed that 100% of beneficiaries reported high utilization of good tillage practices that the program trained them on. Deep tillage is also a sustainable agriculture practice as it can alleviate high soil strength, influencing both the surface and subsoil carbon pools either directly or indirectly (Feng et al., 2020).

Entries in Table 1 indicated that 75.5% of the beneficiaries unanimously reported that they were trained on cassava stem multiplication practice by the programme. Cassava stem multiplication was a source of off-farm income for the beneficiaries and a coping strategy during climate change, as the extra income enabled them to diversify into non-agricultural ventures. According to one of the Value Development Programme's objectives, this will sustainably increase smallholder cassava producers income in the state (IFAD-VCDP, 2021).

Results in Table 1 showed that 80.0% of the beneficiaries recorded high utilization of solar borehole; this implied that it was what one of their felt needs. The result implied that the program helped to develop infrastructure in the state, through establishment of solar borehole in each LGA for obtaining clean water, and improve the beneficiaries' quality of life, as clean water is essential for sustaining life. The result confirms the findings of Otekunri (2022), who state that implementing policy actions promoting rural infrastructure development will lead to increased agricultural production and improved quality of life for rural dwellers.

The data presented in Table 1 indicated that 73.1% of beneficiaries recorded high utilization of land development services provided by the program. The result shows that the beneficiaries had access to more hectares of land for cultivation through the provision of group farms by the program, which led to increased productivity, income, and standard of living. This finding confirms the study of Uzochukwu and Chukwujekwu (2021), who reveal that as farm size increases, farmers' yield and income increase as well.

Data in Table 1 show that 100% of the beneficiaries unanimously agreed that the programme helped facilitate easy access to loans, but none utilized this service which may be due to the rigorous requirements and the high-interest

rates charged by banks. This result confirms the findings of Okonji and Awolu (2021), who report that high-interest rates and a lack of collateral for agricultural credits constrained farmers.

Table 1. Distribution of beneficiaries according to their utilization of cassava production services disseminated by Value Chain Development Programme

Cassava production services used by beneficiaries	Frequency (n=130)	Percentage Used
Timely cassava planting practice (March-June) practices	130	100
Planting in line of 1m by 1m	130	100
Planting of cassava improved variety TME 419	130	100
Use of good tillage practices	130	100
Linkage to other sources of loan like government/NGOs	130	None
Use of organic fertilizer	129	99.2
Construction of aggregation centres	129	99.2
Use of standard measurement 50kg/bag	128	98.5
Provision of matching grant	117	90.0
Provision of clean water source like solar borehole installation	104	80.0
Application of proper weed management practices	103	79.2
Training on cassava stem multiplication practices	98	75.4
Development of land by VCDP	95	73.1
Use of pesticides in pest, insect and nematodes control	79	60.8
Timely application of agro-input	74	56.9
Planting of cassava improved variety TME 0581	70	53.8
Use of good record keep practices	45	34.6
Training on proper maintenance of farm implements	39	30.0
Access to climate information through the use of existing extension systems	26	20.0
Planting of cassava improved variety Pro-Vitamin A fortified	14	10.8
Use of cassava planter	3	2.3

Source: Field Survey, 2023

3.2.1 Level of utilization of cassava production services by the beneficiaries

Furthermore, the results in Figure 1 showed that 60% of cassava producers were moderate users. In comparison, 40% of them were high users of cassava production services disseminated by the Value Chain Development Programme in the state. The result implied that the beneficiaries utilized the cassava production services provided by the programme. The high utilization of the cassava production services could be attributed to the huge benefits derived from the programme services, which improved their productivity, income and living condition. Additionally, the programme services are aligned with their felt needs and are perceived as having relative advantages over previous practices, hence the high utilization by the beneficiaries. The finding agrees with the report of Ovharhe et al. (2021), who posit that when agricultural programs are based on farmers' felt needs, it motivates them to participate fully to gain all the benefits.

Figure 1. Level of use of cassava production services by the beneficiaries

3.3 Relationship between socio-economic characteristics of beneficiaries and their level of utilization of cassava production services disseminated by the Value Chain Development Programme

Data presented in Table 2 revealed the regression results on the relationship between socioeconomic characteristics and the level of utilization of cassava production services disseminated by the Value Chain Development Programme in the state. The result showed that the R^2 value was 0.495, and the adjusted R^2 was 0.462. The implication is that the independent variables included in the model accounted for 46.2% of the variations in the dependent variable.

Data presented in Table 2 showed that years of farming experience (t=3.360, p=3.360, p=0.001) of cassava producers had a positive significant relationship with their utilization of the programme services. This implied that beneficiaries with more years of farming experience utilized the cassava production services disseminated by the programme. This result agrees with the findings of Zosssou et al. (2020), who report that farmers rely heavily on their personal experiences and fellow farmers to adopt agricultural technology.

Also, the results in Table 2 indicated that the education level of beneficiaries had a positive significant relationship with their use of cassava production services disseminated by the Value Chain Development Programme (t=2.948, p=0.004). This meant that the more educated beneficiaries, easily and readily utilized the programme services disseminated which increased their yield and income. According to the findings of Iyere-Freedom and Enwelu (2022), there is a significant positive relationship between farmers' use of agricultural technologies and their level of education.

In addition, Table 2 reported that beneficiaries annual income (t=-3.354, p=0.001) had a negative relationship with their utilization of cassava production services disseminated. The finding implied that as beneficiaries income increased due to the programme benefits, their utilization of cassava services decreased, perhaps due to the drudgery nature of agricultural activities and engagement into off-farm activities due to improved income. This is in line with the study of Udimal et al., (2017), who stated that not all technologies show a positive relationship between farmers' income and adoption and that some studies on labor-intensive technologies show a negative relationship between income and adoption.

Therefore, the null hypothesis for years of farming experience, education level, and annual income is rejected.

Table 2. Relationship between socio-economic characteristics of beneficiaries and their level of use of cassava production services disseminated by Value Chain development Programme

Model	Unstandardized coefficients B	Std. Error	Standardized Coefficients	t
(constant)	11.037	1.357		8.133
Age	0.042	0.027	0.186	1.564
Sex	-0.156	0.318	-0.035	- 0.490
Years spent in formal education	0.167	0.057	0.218	2.948*
Years of farming experience	0.119	0.035	0.291	3.360*
Household size	-0.120	0.073	-0.127	-0.635
Farm size	-0.598	0.534	-0.093	-1.120
Annual income	-2.811E-6	0.000	-0.-283	-3.354*
Marital status	0.211	0.469	0.36	0.451

Source: Field survey, 2023 $p=\leq 0.05$

4. Conclusion and Recommendations

The study concluded that beneficiaries level of education, income level, and years of farming experiences were the socioeconomic variables that influenced their utilization of the cassava production services disseminated by Value Chain Development Programme services in Ebonyi state. The study recommends that the government and programme implementers through extension agents should organize workshops and training programmes for the beneficiaries to help update their knowledge of production. The government and other relevant stakeholders should provide financial incentives to the beneficiaries to sustain and improve their level of utilization of the production services disseminated to minimize the cost of production and motivate them to produce.

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