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Adoption of cocoa input technologies under agricultural transformation agenda among women cocoa farmers in Ile-Ife, Osun State

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Majority of women cocoa farmers in Ile-Ife are poor and are often excluded from beneficial programs and trainings that can improve their welfare. The study analyzed the effect of public agricultural transformation programme on women farmers. Specifically, the critical issue of access to, and adoption of productivity enhancing input are analyzed. Data for the analyses were drawn from women farmers in cocoa (cash crop) production in rural Nigeria. A Multistage sampling technique was used to select 70% of the women cocoa farmers (80) who were farm owners and solely responsible for farm production decision. The data were analyzed using Tobit regression technique. The results showed that marital status of respondents and perception of increased income were significant and positive at 5% while number of visits by extension workers was also positively significant at 10%. The level of education, number of children and farming experience had negative and significant impacts on adoption of ATA policy. As farming experience and the number of children of each woman increase, the level of adoption of ATA program would decrease. The study concludes that most women farmers lack relevant information on the benefits and targets of public agricultural development programme. This greatly limits their ability to participate and benefit from such. There is a need to review the public agricultural information transmission channel.

Key words: Women, cocoa, adoption, agricultural transformation agenda.

INTRODUCTION

The Federal Government of Nigeria instituted National Economic Transformation program as a means to diversify Nigerian economy from oil. In line with this, the Federal Ministry of Agriculture and Rural Development implemented an Agricultural Transformation Agenda (ATA) in that will promote agribusiness, attract private sector investment in agriculture, reduce post-harvest losses, add value to local agricultural produce, develop rural infrastructure and enhance access of farmers to financial services and markets. The ATA sets out to create over 3.5 million jobs along the value chains of the priority crops of rice, sorghum, cassava, horticulture,

cotton, cocoa, oil palm, livestock, fisheries, etc. for Nigeria's teeming youths and women, in particular. Agricultural Transformation Agenda (ATA) started in countries like China, Vietnam, Brazil and Thailand. This brought about a drastic growth in their agricultural sectors and reduced unemployment rate. In Nigeria, this policy was initiated in 2011 to achieve a hunger-free country through an agricultural sector that drives income growth and transforms Nigeria into a leading country in global food markets. Cocoa is a major agricultural export of Nigeria; in 2013/2014 Nigeria produced an estimated 230,000 tons of beans (ICCO, 2014) and this is largely produced by smallholder farmers. On the whole, the average output per farmer is less than 300 kg per hectare of cocoa (Nwachukwu et al., 2010). Cocoa is one of the capital intensive businesses especially when it comes to the purchase of improved seedlings. This becomes more challenging to women who usually have no or limited fund for investment. Women make crucial contributions in agriculture and rural enterprises in all developing country regions, as farmers, workers and entrepreneurs. In sub-Saharan Africa women have relatively high overall labour-force participation rates and the highest average agricultural labour-force participation rates in the world (FAO, 2011). Women farmers are central to the sustainability of the cocoa supply chain and cocoa-growing communities. Although they are often overlooked and unrecognized, women farmers and laborers make a significant contributions to the amount of cocoa produced, which is under increasing demand (Marston, 2016).

Despite the important roles of women in cocoa business in Nigeria, they are saddled with most of the tasks in cocoa production 'supposedly' meant for the man while their returns to labour are not commensurate to the man-hours spent on the task. Majority of them are hardly given any attention in the area of training and/or visitation by extension agents with improved technologies. Banks do not grant them loans because of lack of ownership over assets and they are hardly reached with improved seedlings, fertilizer and other inputs (FAO, 2011; SAHEL, 2014; OXFAM, 2013). These conditions have entrenched the women in a vicious cycle of poverty that places them at a less advantageous vantage of income and resource empowerment.

Women farmers face daily struggle with gender inequality in cocoa market. Women are often hired for lower paying work while men do more wage rewarding works. Over the years, traditional institutions have been involved in policy formation involving only men in the exercise. They are seldom involved in key decision roles (UN, 2011; Adeniyi, 2010). According to Kofi (2003), when women are fully involved in decision making, families are healthier, better fed, with increased family incomes, improved savings while re-investment increases. In order to tackle the issues in Nigeria, certain strategies have been put in place by the Federal Government and

research institutes. Nigerian Cocoa Research Institute (NCRI) had released eight new cocoa hybrids through ATA giving out 1.4 million cocoa pods to farmers in cocoa producing states in the country. Also, provision of inputs such as fertilizers, insecticides and fungicides at a subsidized rate was also included. It is believed that if women in cocoa producing areas of Osun state adopt the use of cocoa improved seedling, outputs from cocoa will increase thereby improving the benefits the women derive from cocoa business. This will attract more men and women into the business especially the youths thereby increasing the revenue Nigeria derives from cocoa production

MATERIALS AND METHODS

The study was carried out in Osun State of Nigeria. A multistage random sampling technique was employed in data collection. The first stage involved the purposive selection of two Local Government Areas (LGAs) noted for cocoa production. In the second stage, purposive sampling technique was used to select 5 villages per LGA prominent in cocoa production was done. In the third stage, proportional and snow ball sampling technique was used to select 5-10 respondents per village to make a total of 80 respondents. Data were collected with the use of questionnaire on 2013/2014 cropping season including the socio-economic characteristics of the respondents such as age of the farmer, sex, marital status, farm size, household size etc. level of awareness of Agricultural Transformation Agenda of improved cocoa seedlings among women cocoa farmers, extension visit, neighborhood effect and the level of adoption of ATA policy. Descriptive statistics was used to describe the socio-economic characteristics of the respondents, level of awareness of ATA and the level of adoption in the program. Tobit regression model was employed to analyze factors that affect adoption of improved cocoa seedlings among women cocoa farmer in the study area.

Tobit model

In a Probit model the variable of theoretical interest, y*, is unobserved; what is observed is a dummy variable, y, which takes on a value of 1 if yi* is greater than 0, and 0 if otherwise. In contrast, Splett et al. [1994] devised what became known as the Tobit (Tobin's probit) or censored normal regression model for situations in which y is observed for values greater than 0 but is not observed (that is censored) for values of zero or less. The standard Tobit model is defined as,

$Y_i^* = x_i\beta + \varepsilon i$
$Y_i = Y_i^*$ if $Y_i > 0$
$Y_i = 0$ if $Y_i \leq 0$

where yi* is the latent dependent variable, yi is the observed dependent variable, xi is the vector of the independent variables, β is the vector of coefficients, and the $\varepsilon$is are assumed to be independently normally distributed: $\varepsilon i \sim N(0, \sigma 2)$ (and therefore yi $\sim N(xi\beta, \sigma 2)$).

Tobit model is explicitly expressed as: $Y = \beta_0\phi + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \ldots \beta_{17} X_{17} + U_x$

Y= level of adoption (0….1)
β_0= constant, β= coefficient, $X_1, X_2, X_3 \ldots X_n$ = explanatory variable,

Table 1. Result on socio-economic characteristics of cocoa women farmers in Ile-Ife.

Variable	Mean/mode	Percentage
Age	45	45
Marital Status	Married	67
Educational Level	Secondary Education	45
Number of Children	4	33
Level of Income	Personal Savings?	98

Source: Data analysis, 2015.

Table 2. Result of the awareness of ATA improved cocoa seedlings among cocoa women farmers in Ile-Ife.

Variable	Awareness	Percentage
Information on ATA	Yes	88
Year of awareness	2012 (A year after ATA started in Nigeria)	38
Awareness of input distribution	Yes	88
Awareness of hybrid Pods	Yes	88
Awareness of rehabilitation supports	Yes	81
Awareness of Cocoa Quality	Yes	78

Source: Data analysis, 2015.

U_i = error term,

The explanatory variables are:

X_1 = age (years), X_2 = Gender, X_3 = Level of education (years), X_4 = Farming experience (years), X_5 = Household size (numbers), X_6 = Yield (tonnes/hectare), X_7 = Credit facility (₦), X_8 = Extension services (number of visits), X_9 = Awareness of ATA program, X_{10} = Neighborhood effect, X_{11} = Input availability from ATA, X_{12} = Source of credit facility, X_{13} = Distance from farm to the market (km), X_{14} = Transportation cost, X_{15} = Farmer's willingness to participate in ATA, X_{16} = Farmer's perception of improved income, X_{17} = Selling point.

RESULTS AND DISSCUSSION

Result of socio-economic characteristics

Table 1 present the socio-economic result of the cocoa farmers in Ile-Ife. The result shows that about half of the women are still agile and majority of them were married with average of secondary school education. This suggests that assessing useful information will not be difficult for these women provided their domestic duties permit them. About one-third of them have an average of 4 children and are running the cocoa business with personal savings. This explains one of the reasons why majority of the women are into cocoa business on a small scale. This established the findings of Koyenikun and Emede (2011) where increased awareness of programs among respondents did not produce corresponding adoption rate.

Result of the awareness of ATA program among cocoa women farmers in Ile-Ife

The result (Table 2) shows that majority of the women had information about the cocoa input technologies under ATA and were well informed about the various inputs and benefits of participating in ATA as early as a year after the program started. This suggests that the level of awareness is not poor among women cocoa farmers in Ile-Ife.

Result of assessment of the level of adoption of ATA among women cocoa farmers in Ile-Ife

Findings from this assessment (Table 3) revealed that majority of the women had a good perception of the agenda and were willing to adopt it. However, majority (71%) of the women did not register with the LGAs to participate in the agenda. Possible explanation to this could be because of poor extension visits to demonstrate the technologies to the women which might be the reason for the poor level of adoption (4%) of the agenda among women cocoa farmers in the study area.

Results of the factors that determine adoption of ATA among women cocoa farmers

From Table 4, age, marital status, credit facility, extension services, awareness of ATA/ neighbourhood effect had positive effects on level of adoption while education,

Table 3. Result of assessment of the level of adoption of improved cocoa seedlings under ATA.

Variable	Mean	Percentage
Registration with LGA office	No	71
Perception about ATA	Good	73
Extension visit for neighbourhood demonstration	No	69
Willingness to adopt ATA	Yes	84
Number of women that adopted cocoa input technologies under ATA	Yes	4

Source: Data analysis, 2015.

Table 4. Tobit regression result.

Adoptata	Coefficient	Std. Err	. t	P>|t|
Farmers age	0.0022007*	0	0.64	0.526
Marital status	0.1922973**	0.0723923	2.66	0.010
Gender	-0.0861117	0.0681914	-1.26	0.211
Level of education	-0.0212944*	0.0344593	-0.62	0.539
No of children	-0.0080003*	0.020634	-0.39	0.699
Farming experience	-0.0107621**	0.0041325	-2.60	0.011
Assess to credit facility	0.2450408	0.0716042	3.42	0.001
Extension agents	0.1591418***	0.0528423	3.01	0.004
Awareness of ATA	0.0265184	0.0735663	0.36	0.720
Neighbourhood adoption	-0.1819562	0.0517394	-3.52	0.001
Willingness in ATA	-0.0010705	0.1040892	-0.01	0.992
Perception abt ATA		0.1422138**	0.0539467	2.64	0.010
Yield/Ton	0.164119	0.193704	0.85	0.400
Means of obtaining fund	-0.1564538	0.1162929	-1.35	0.183
_constant	1.284034	0.3583402	3.58	0.001
/sigma	.1835336	0.0146885		

Source : Data analysis, 2015.
Note: ***=1% level of significance, **= 5% level of significance, *= 10% level of significance.

number of children depending on the level of income and farming experience affected level of adoption negatively. Age of women cocoa farmers in the study area has a positive and significance relationship with adoption of cocoa technology. This shows that if the age of the women farmers increases, there is going to be an increase in the level of adoption of ATA. This implies that as women cocoa farmers grow older the level of adoption of cocoa input technologies under ATA increases. Marital status of the respondent is also positive and had a significant relationship with adoption of cocoa seedlings technology. This indicates that if there is an increase in marital status of the respondents the level of adoption of ATA will increase. This implies that as women cocoa farmers transit from being single to a married life, the level of adoption improves.

Perception of women cocoa farmer of improved income is also positive and significant which indicates an increase in the conscious understanding that ATA policy will increase income of women cocoa farmers will make the adoption of cocoa input technologies under ATA to increase. From this result, the number of visit of extension agent to the respondents was positive and significant as presented in Table 4. This explains that the level of adoption of ATA will increase with an improvement in the extension services offered to these adopters in the study area which could be in the form of increased frequency of visits and etc. Farming experience is also negatively significant at 5% level with a coefficient of 0.011 implying that the more or the higher the level of experience of respondents, the less or lower the level of adoption of cocoa improved seedlings under ATA.

Conclusion

Age, marital status, credit facility, farming experience, level of education, awareness about ATA/ neighbourhood effect, people depending on income and visit by

extension agents were factors affecting the level of adoption of cocoa input technologies under ATA among women cocoa farmers. Farmers that are married and have a good understanding or perception that ATA would increase their level of income would tend to adopt the agenda more. Increase in the number of visit of the extension agent to the respondents, to advice or sensitize them on the benefits of ATA would increase the level of adoption. The higher the level of education and farming experience, the lower the level of adoption of the respondents which may be due to the past experience with past government programs or failure of past government policies.

RECOMMENDATION

The number of visits of extension agent to the study area should be increased and awareness about cocoa input technologies under ATA should be intensified among women cocoa farmers in the study area. Credit facility should also be made available to the farmers.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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