European Journal of Agriculture and Forestry Research
Vol.7, No.2, pp.24-31, May 2019
Published by European Centre for Research Training and Development UK (www.eajournals.org)

SOCIO-ECONOMIC FACTORS INFLUENCING UTILIZATION OF MANUAL SCREW PRESS FOR GARI PRODUCTION IN KWARA STATE, NIGERIA

Adegbola Adetayo Jacob[1], Wegh Francis Shagbaor[2], Ikwuba Agnes Agbanugo[3], Nwafor Solomon Chimela[4]
[1]Extension Department, Nigerian Stored Product Research Institute, Nigeria
[2] Department of Sociology, Benue State University, Nigeria
[3] Department of Sociology, Benue State University, Nigeria
[4] Extension Department, National Root Crops Research Institute, Nigeria

ABSTRACT: *This study investigated socio-economic determinants of utilization of manual screw press for cassava mash dehydration for gari production in four local government areas across the ADP zones in Kwara state, Nigeria. Using multistage sampling technique and a semi-structured questionnaire as instrument, data for the study were collected from a sample of three hundred and eighty four (384) gari processors who use the screw press in the state. Multiple regression analysis show that a correlation (R=0.678) exist between utilization of the screw press and the independent variables which include age, household size, level of education, years of processing experience, extension visits, and income from gari processing. R^2 value of 0.460 indicates that about 46% of the variation in utilization was explained by socio-economic variables included in the regression model. Three variables significantly influenced the decision of the respondents to utilize the manual screw press: age, level of experience, and income; the most important predicator being income with a Beta value of 0.699. Conclusively, it was recommended among others that research, extension, and policy makers consider the significant determinants identified in the study seriously if increased utilization is to be achieved by gari processors and others similar to them in the study area and the region.*

KEY WORDS: Improved technology, Manual screw press, Socio-economic factors, Utilization,

INTRODUCTION

Improved agricultural technologies exist in all facets and stages of agriculture; be it at production or at postharvest stages, and have played a major role in developing the agricultural industry (Solomon, 2010). Agricultural innovations are important parts of any agricultural system and are vital in all circumstances, whether there is surplus or deficit (Vilane, Shongwe, Motsa, & Shongwe, 2012). However, increasing the efficiency of agriculture both at production and at postharvest stage through improved agricultural technologies depends on the extent to which farmers and processors incorporate these technologies into their operations (Sasore, 2005).

Most of the evidence about effect of improved technologies in agriculture comes from South-East Asia (Japan, Taiwan, and South Korea etcetera). In South-East Asia, growth in agricultural productivity has been rapid, largely as a result of the extensive utilization of modern agricultural technologies, and for millions of poor people the technological advances of the Green Revolution

Print ISSN: ISSN 2054-6319 (Print), Online ISSN: ISSN 2054-6327(online)

provided a route out of poverty (Ravallion & Chen, 2004). In Africa however, there are far few examples of where agricultural technology has benefited smallholder farmers on a national scale (Lanjouw & Stern 1998). Particularly, Doward, Kydd, Morrison, & Urey (2003) maintained that utilization of agricultural innovation has been inadequate in most parts of Africa. Nevertheless, facts from Zimbabwe reveal a post-independent Green Revolution amongst smallholder farmers which have had a significant influence on poverty through the introduction of hybrid maize, expanded access to credit, guaranteed prices and marketing subsidies (Eicher, 1995).

The implications of understanding the factors that influence farmer's decisions to utilize improved technology are enormous. Understanding these factors is essential in planning and executing technology related programmes for meeting the challenges of food security in developing countries. To enhance technology utilization by rural agro processors, it is important to understand factors that influence their decision to utilize technology in order to come up with technology that will suit them. Simply put, understanding some of the dynamics in improved post harvest technology utilization decision can help researchers working in the cassava processing sector to design innovations. Consequently, the variables that would be identified as key indicators towards explaining utilization of the manual screw press can be utilized within this context.
The main objective of the study is to investigate socio-economic factors influencing utilization of manual screw press for dehydrating cassava mash for gari production in Kwara state, Nigeria.

MATERIAL AND METHODS

The study was conducted in Kwara State, Nigeria, located between Latitude 8^0 $05^{'}$ and 10^0 $05^{'}$ North and Longitude 2^0 $50^{'}$ and 6^0 $05^{'}$ East of Greenwich Meridian (Oyebanji, 2000). According to National Bureau of Statistics (2012) Kwara state has a land mass of 35,705 square kilometres (km^2). The 2006 population census by the National Population Commission put the population of the state at 2,371,089 (Federal Government of Nigeria, 2007). This study is a cross-sectional survey. Multi-stage sampling technique was used to select respondents for the study. For this study, necessary sample size of 384 was calculated and adopted using the formula by Smith (2013) for determining necessary sample size when population is unknown or approximated.

One local government area (LGA) each from the four agricultural zones of the state namely Kaima, Edu, Asa, and Ifelodun was purposively selected to ensure that the study cuts across the ADP zones in the state. Simple random sampling technique was used to select three (3) wards each from local government areas selected earlier selected. Consequent on the fact that it is difficult, if not impossible to come up with sample frame for the study by the researcher or from secondary sources; because of the nature of the population itself, it was imperative that Gari processors who utilize the manual screw press who have been previously identified through the assistance of local resource persons from each ward was selected through a simple random sampling method. Primary data was collected by the researcher through interviews (individual interview). In order to avoid ambiguity and a weak evaluation of the phenomenon under study, this study will limit itself to assessment of socioeconomic factors namely: age, household size, level of education, years of processing experience, extension visit(s), and income from gari processing. Inferential statistics

Print ISSN: ISSN 2054-6319 (Print), Online ISSN: ISSN 2054-6327(online)

namely multiple regression was used for analysis of generated field data. The regression equation is shown below:

$Y = a+b_1x_1+b_2x_2+b_3x_3+b_4x_4+b_5x_5+b_6x_6+e.$

Where:

Y = Utilization of the manual screw press for gari processing

a = constant term

$b_1 – b_6$ = Regression Coefficients of $x_1 – x_6$ to be estimated.

x_1 to x_6 = Independent variables as defined in the general equation

X_1 = Age

X_2 = Household size

X_3 = Level of Educational Qualification

X_4 = Level of experience

X_5 = Contact with extension agents

X_6 = Level of income from gari processing

e= error term

A priori expectation of the explanatory variables

Age is expected to have a negative sign (Omonona et al, 2005), household size is expected to have a positive or negative sign (Omonona et al, 2005), level of education is expected to have a positive sign (Chilot et al, 1996), level of experience is expected to have a positive sign (Chilot et al, 1996), extension contact is expected to have a positive sign (Omonona et al, 2005), and level of income from gari processing is expected to have a positive sign (Unamma, 2014). A positive sign on a parameter would indicate that the higher the value of the variable, the higher the utilization level. Simply put, if the value is positive we can tell that there is a positive relationship between the predicator and manual screw press utilization; whereas a negative coefficient represents a negative relationship.

RESULTS AND DISCUSSION

Table 1: Multiple regression showing relationship between utilization and socio-economic variables and their contribution in explaining the variability in utilization of the manual screw press

Variables	Unstandardized Coefficients		Standardized Coefficients	t	sig
	B	Std. Error	Beta		
(Constant)	6.235	.309		20.159	.000
AGE (X_1)	-.126 * **	.051	-.106	-2.459	.014
HOUSEHLDSIZE (X_2)	.044 NS	.038	.045	1.148	.252
LEVOFEDU (X_3)	-.031NS	.050	-.024	-.607	.544
YEARSOF EXP (X_4)	.090 ***	.035	.116	2.536	.012
EXT. VISIT (X_5)	-.212 NS	.157	-.051	-1.353	.177
INCOME (X_6)	.627 ***	.038	.699	16.439	.000
R=0.68					
R^2 = 0.46					
Adjusted R^2 = 0.45					

Print ISSN: ISSN 2054-6319 (Print), Online ISSN: ISSN 2054-6327(online)

*** Coefficient statistically significant at 1%
NS Not significant
The model is fitted as: Y = 6.235 + -.106(-.126) + .045(0.44) + -.024(-.031) + .116(.090) + -.051(-.212) + .699(.627) + 0.309
The result of the multiple regression analysis as shown on Table 1 indicates that a correlation (R= 0.68) exist between utilization of the manual screw press for cassava pulp dehydration and the independent variables. The R is the simple correlation between the socioeconomic variables and utilization of the manual screw press. The Table also shows that R^2 (coefficient of multiple determination: R^2 measures the proportion of variation in Y explained by X) value is 0.460; indicating that about 46% of the variation in utilization of the manual screw press was explained by variables included in the model. The remaining 54% could be attributed to the variables not included in the regression model. The adjusted R^2 gives some idea of how well the model generalizes, and ideally the value should be close to the value of R^2. The difference in R^2 and adjusted R^2 for the model is a fair bit (0.460 – 0.452 = 0.008 or 0.8%). This means that if the model were derived from the population rather than from the sample it will account for approximately 0.8% less variance in the outcome. Furthermore, because, the predictors identified in the study were only able to explain 46% of variation in the utilization of the manual screw press indicates that there is need to mobilize new factors.

From the result of the regression analysis as shown in Table 1, the regression coefficient of age (-0.126) is statistically significant at 1% level. This implies that age of respondents is significantly related to utilization of screw press for dehydration of cassava mash for gari production in the study area. Or simply put, age composition of respondents for the study is a significant factor in utilization of the screw press; however it was negatively significant. The negative sign of regression coefficient of age(x_1) is in agreement with *a priori* expectation of the explanatory variable as stated earlier. That age was negative signifies an inverse relationship. In order words, increase in age reduces the level of utilization of the manual screw press among respondents. This means that, as gari processors ages on, he/she will use the screw press less in gari processing. That is to say, age has a negative influence on utilization among the respondents. That age of respondents is negatively related with manual screw press utilization confirms the risk aversion component in the diffusion theory; older farmers are more risk averse, and are less likely to experiment with new technology.

The finding suggests that when age increases, there would be a decline in screw press utilization among the gari processors. A possible explanation for this is that older processors have less need for extra income and do not see the need to try new methods or utilize improve methods that could increase their productivity and income. Again, as processors grow old, there is the tendency to reduce level of adoption as their ability to cope with various processing operations diminishes.The finding of this study corroborates Wasula (2000) who found that age significantly influence the utilization of contour vegetative strips farming. Suleman (2012) also found out in his study that age of farmers is significantly related to utilization; non-adopters were older than adopters. Kinuthia & Mbaya (2017) study on determinant of technology utilization and how it affects farmers' standard of living in Tanzania and Uganda show that in both Tanzania and Uganda

Print ISSN: ISSN 2054-6319 (Print), Online ISSN: ISSN 2054-6327(online)

farmers who plant new seed varieties are relatively younger than those who do not, suggesting that as farmers age they are less open to adopting improved technologies.

From the result of the regression analysis as shown in Table 1, the regression coefficient of household size (0.044) is positive, but not significantly related to utilization of manual screw press for dehydration of cassava mash for gari production in the study area. That is, household size of respondents is not a significant factor in utilization of the screw press. However, that regression coefficient for household size (x_2) was positively signed, agrees with the *a priori* expectation of the explanatory variable as earlier stated.

This result fully agrees with Tijjani (2010) who also found household size to be insignificant in the adoption of recommended cowpea production practices. However, our finding contradicts Bonabana- Wabbi (2002) who maintains that household size influences utilization of agricultural technology in that, a larger household have the capacity to relax the labor constraints required during introduction of new agricultural technology.

From the result of the regression analysis as shown in Table 1, the regression coefficient of level of education (-.031) is not significantly related to utilization of screw press for dehydration of cassava mash for gari production. The implication is that level of education of respondents is not a significant factor in utilization of the screw press; education or lack of education does not affect utilization level of the screw press by gari producers in Kwara state. However, regression coefficient for educational level(x_3) revealed a negative sign which does not agree with the *a priori* expectation of the explanatory variable as stated earlier.

The result corroborates Anaglo et al (2017) study, they found no significant relationship between level of education and farmers level of adoption. The reason for this according to them may be that information on improved livestock production practices disseminated by extension service providers were not done using materials that require high level education to use, thus all farmers having both low or high education are equally able to apply the improved technologies. This is contrary to findings of Adam & Boateng (2012) who observed that education significantly influences adoption of technological innovation in small ruminant production.

From the result of the regression analysis as shown in Table 1, the regression coefficient of processing experience (0.090) is significantly related to utilization of screw press for dehydration of cassava mash for gari production in the study area. That is, processing experience of respondents is a significant factor in utilization of the screw press. This is possibly because as gari processors acquire more experience, they would have full information and better knowledge hence able to evaluate the advantage of the technology and utilize it. Furthermore, regression coefficient for level of experience(x_4) was positively signed in agreement with the *a priori* expectation of the explanatory variable as previously stated.

Our result is in agreement with the study of Mulaudzi & Oyeleke (2015) who found significant relationship between experience of farmers and level of adoption, although negatively related. Mulaudzi & Oyeleke explained that more experienced farmers were unlikely to adopt improved

Print ISSN: ISSN 2054-6319 (Print), Online ISSN: ISSN 2054-6327(online)

technologies, possibly because they are close to retirement, leaving less time to increase their benefit from proceeds that investment may bring. Again, our finding is in agreement with Ainembabzi & Mugisha (2014) who investigated the relationship between adoption and experience with agricultural technologies and found out that there was a significant relationship between experience of farmers and adoption of agricultural technologies in banana, coffee and maize in Uganda.

From the result of the regression analysis as shown in Table 1, the regression coefficient of extension contacts (-0.212) is not significantly related to utilization of screw press for dehydration of cassava mash for gari production in the study area. That is, extension contacts of respondents are not a significant factor in utilization of the screw press in the study area. What this means is that whether processors are visited by extension agents or not does not determine if they would use the screw press or not use it. Furthermore, regression coefficient for extension contact(x_5) was found to be negatively signed which contradicts the *a priori* expectation of the explanatory variable as previously stated.

Our finding is consistent with that of Olaniyan (1998) who found extension contact not to be significantly related to adoption of improved cassava processing technologies. This result also corroborates the finding of the study of Suleman (2012) on factors influencing adoption and utilization of improved cassava processing technologies in Edo state, Nigeria. In his study Suleman found that extension contact of cassava processors does not have a significant influence on the adoption and utilization of improved technologies.

From the result of the regression analysis as shown in Table 1, the regression coefficient of household income from gari processing (0.627) is significantly related to utilization of screw press for dehydration of cassava mash for gari production in the study area at 1% level. That is, income of respondents from gari processing is a significant factor in utilization of the screw press. Our result shows that for every unit increase in household income from gari processing, a 0.627 point increase in utilization is predicted. This makes income from gari processing the most important predictor for utilization of the screw press for gari processing among the respondents. Furthermore, that regression coefficient of household income from gari processing (x_6) was positively signed agrees with the *a priori* expectation of the explanatory variable as stated earlier.

The result implies that increase in income will lead to increase in utilization of the manual screw press. This result is in consonance with the findings of Unamma (2004) and Chinaka, Ogbuokiri, & Chinaka (2007) who found a positive relationship between farm income and adoption; higher incomes enable farmers acquire new or improved technologies that could be financially inaccessible to others. The result also affirms the positions of Mittal, Gandhi, & Tripathi (2010) and Zhang, Fan & Cai (2002) that there is significant and positive relationship between income and utilization of agricultural innovations.

Print ISSN: ISSN 2054-6319 (Print), Online ISSN: ISSN 2054-6327(online)

CONCLUSION

Factors that significantly affect utilization of the manual screw press among respondents are limited to age, years of experience, and level of income. In other words, age, years of experience, and household income from gari processing were important predicators and are factors to consider in the utilization of similar technologies in the study area and comparable regions. To that end, any extension strategy for gari processors aimed at high level improved technology utilization should critically consider the roles of these factors because they have a bearing on utilization decision of the respondents.

References

Adam, H., & Boateng, S. (2012) Adoption of Innovation by Small Ruminant Farmers in Northern Ghana: the Case of Tolon-Kunbunga Districts. Journal of Biology, Agriculture and Healthcare 2(11):10-20

Ainembabazi, J.H., & Mugisha, J. (2014) The Role of Farming Experience on the Adoption of Agricultural Technologies: Evidence from Smallholder Farmers in Uganda. The Journal of Development Studies, 50(5): 666-679

Anaglo, J.W., Asare, C.J., Manteaw, S.A., & Boateng, S.D. (2017) Influence of Improved Technology Adoption on Livelihoods of Small Ruminant Farmers in Ghana. American-Eurasia Journal of Agriculture and Environmental Sciences, 17(1): 78-84

Bonabana – Wabbi, J (2002). Assessing Factors Affecting Adoption of Agricultural Technologies. The Case of Integrated Pest Management (IPM) in Kumi District, Eastern Uganda. Unpublished Msc Thesis Virgina Polytechnic Institute and State University USA.

Chilot, Y., Shampiro, B.I & Demeke, M. (1996). "Factors Influencing Adoption of New Wheat Technologies in Wolmera and Addis Alem Areas of Ethiopia". *Ethiopian Journal of Agricultural Economics, (1): 63-83*

Chinaka C. C, Ogbuokiri L. C and Chinaka E. C. (2007). Adoption of Improved Agricultural Technologies by Farmers in Aba Agricultural zone of Abia State. Proceedings of the 41st Conference Held at Institute for Agricultural Research, Samaru, ABU Zaria 22 – 26 October, Pp. 531-534.

Doward, A., Kydd, J., Morrison, J., & Urey, L. (2003) A Policy Agenda for Pro-poor Agriculture Growth. World Development, 32(1): 73-89

Eicher, C. (1995) 'Zimbabwe's Maize-based Green Revolution: Preconditions for Replication' World Development 23 (5): 805-818.

Federal Government of Nigeria (2007) Federal Republic of Nigeria Official Gazette, 94(24): 190-191. Printed and Published by The Federal Government Printer, Lagos, Nigeria.

Kinuthia, B.K., & Mbaya, E. (2017) The Impact of Agriculture Technology Adoption on Farmers' Welfare in Uganda and Tanzania. Partnership for Economic Policy, number 163, February 2017

Lanjouw, P., & Stern, N. (1998) Economic Development in Palanpur over Five Decades. Oxford, UK: Clarendon Press.

Mittal, S., Gandhi, G., & Tripathi, G. (2010) Socio Economic Impact of Mobile Phones on Indian Agriculture. ICRIER Working Paper 246. New Delhi: International Council for Research on International Economic Relations.

Print ISSN: ISSN 2054-6319 (Print), Online ISSN: ISSN 2054-6327(online)

Mulaudzi, S.V., & Oyeleke, S.A. (2015) Smallholder Farmers Adoption Intensity of Genetically Modified maize Varieties in Thulamela Municipallity, Limpopo Province, South Africa. Environmental Economics, 6(110: 104-112

National Bureau of Statistics (2012) Annual Abstract of statistics. Federal republic of Nigeria

Olaniyan, O.F. (1998). Adoption of Improved Cassava Varieties by Women Farmers in Rural Areas of Oke-Ogun, Oyo State, Unpublished M.Sc. Thesis, Department of Agricultural Extension, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.

Omonona, B., Oni, O., & Uwagboe, O. (2005) Adoption of Improved Cassava Varieties and its Impact on Rural Farming Households in Edo State, Nigeria. Journal of Agriculture and Food Information 7(1): 40-45

Oyebanji, J.O. (2000) Kwara State. In A.B. Mamman, J.O. Oyebanji, S.W. Petters (Edt), Nigeria: A People United, A Future Assured, Volume 2, Survey of States. Federal Ministry of Information, Abuja, 2000.

Ravallion, M., & Chen, S. (2004) "How have the World's Poorest Fared since the early 1980s?" World Bank research Observer, 19(2):141-170

Sasore, G.M. (2005) "Nigerian's Export Trade of Agricultural Commodities; Quality Control and Standards". A Paper presented at Nigeria National Crop Outlook Conference held at Durbar Hotel Kano, 26th – 27th May, 2005 pp26.

Smith, C. (2013) Determining sample size: How to Ensure you get the Correct Sample Size. qualtrics.com/experience-management/research/determine-sample-size

Solomon, A. (2010) Estimating Welfare Effect of Modern Agricultural Technologies: A Micro-Perspective from Tanzania and Ethiopia. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Nairobi

Suleman, A. (2012) Factors Influencing Adoption of Improved Cassava Processing Technologies by Women Processors in Akoko-Edo Local Government Area, Edo state, Nigeria. Unpublished thesis, Ahmadu Bello Universitity, Zaria, in partial fulfilment of the requirements for the award of Msc degree in Agricultural Extension and Rural sociology.

Tijjani, A.R. (2010). Factors Influencing Adoption of Recommended Cowpea Production Practices in Rimi L.G.A. Katsina state. M.Sc. Agric. Ext. Thesis, ABU, Zaria.

Unamma, R.P.A. (2004). Agricultural Technology Generation and Transfer Strategies for Food Security. Proceedings of the 6th Annual Zonal Research and Extension Farmers Input Linkage Systems (REFILS) Workshop South and South/South Zone of Nigeria 12 – 13 November.

Vilane, B.R.T., Shongwe,M.I., Motsa, N.M., & Shongwe, V.D. (2012) Adoption of Postharvest Technologies Used by Smallholder Farmers in Swaziland. African Journal of Agricultural Research, 7(35): 4983-4995

Wasula, S. L., (2000). Influence of Socio-economic Factors on Adoption of Agro-forestry Related Technology. The Case of Njoro and Rongai Districts, Kenya. (Unpublished M. Sc. Thesis). Njoro, Kenya: Egerton University.

Zhang, X., Fan, S., & Cai X. (2002): The Path of Technology Diffusion: Which Neighbours to Learn From? Contemporary Economic Policy, *20*: 470–479

Print ISSN: ISSN 2054-6319 (Print), Online ISSN: ISSN 2054-6327(online)