



Determinants of Late Adopter and Discontinuance of (Cassava Tropical *Manihot* species (30572) Among Farmers in Iwo (ADP) Zone Area of Osun state, Nigeria

Ehien¹ A.E., Apantaku S. O², Makinta U¹ and Olaniran O. M³.

¹Department of Agricultural Economics and Extension, Faculty of Agriculture, Federal University Dutse, Jigawa State, Nigeria.

² Department of Agricultural Extension and Rural Development, Faculty of Agriculture, Federal University of Agriculture Abeokuta, Ogun State, Nigeria.

Corresponding author Email/No: ummakin83@gmail.com 07033035256

Abstract

*This study however assessed the factors determining the late adoption and discontinuance of Cassava species (*Manihot*, TMS 30572) in Iwo (ADP) zone of Osun State Nigeria. The specific objectives of the study among others were to; to describe the socio-economic characteristics of TMS 30572 cassava farmers in the study area. Primary data were obtained by the use of structured questionnaire that was administered to 120 cassava farmers who were selected through multi stage random sampling. The analytical tools used in this study were; descriptive (Means, Standard deviation, frequencies and percentages) and inferential statistics (correlation). Findings from the study revealed that majority (92%) of the respondents were males, had primary education with Farming as the primary occupation of majority (75%) of the farmers. The results also revealed that majority (97%) are married and acquired their land through inheritance. Result from age of the farmers showed that most of them fall within the age range of 35-50 years with a house hold size of 6-10 persons. Result from relationship between some selected socioeconomic variables and late adoption showed that sex, age and primary occupation have a positive relationship. Also, result from relationship between some selected socioeconomic variables and discontinuance revealed that educational level, primary occupation and farming experience have positive relationship. Result from factors that influence late adoption and discontinuance showed that problem of pest and diseases and behavior of extension agents ranked highest respectively. Results from correlation result indicated that sex has the highest r^2 value and positively related to the selected socio economic variables influencing late adoption while farming experience has the highest r^2 influencing discontinuance. It was concluded that that there is no significant relationship between the socio-economic characteristics of late adopter of cassava TMS 30572 and similarly that there is no significant relationship between the socio-economic characteristics of discontinuance of cassava TMS 30572. The study however recommended that extension agent must enlighten the farmers on the profitability of the cassava TMS 30572.*

Keywords: *Discontinuance, Cassava, late-Adoption, Manihot Species, Discontinuance, TMS 30572, Cassava farmers.*

1.0 Introduction



Cassava (*Manihot* species) is a crop of the humid tropics that belongs to the family Euphorbiaceae. Africa produces about 50-80 million tonnes annually which translates into an average of more than 300 calories per day for more than 200 million people (Martins *et al.*, 2017). Among the mostly recommended cultivated varieties and species in Nigeria are TME 419, TMS 90257, TMS 81/00110, TMS 91934, TMA 82/00661, TMS 30001, TMS 30572 among others (Martins *et al.*, 2017). Cassava is the most grown crop in the southern part of Nigeria especially by the smallholder farmers. It plays a vital role in the food security of the rural economy because of its capacity to yield under marginal soil conditions and its tolerance of drought (IITA, 2014). Both rural and urban communities use cassava mainly as food in both fresh and processed form (IITA, 2014). Cassava based meal are the most frequently eaten meals in the rural areas of southern Nigeria. Data from the Collaborative Study of Cassava in Africa (COSCA) showed that 80% of Nigerians in the rural areas eat cassava meal at least once week (Nweke *et al.*, 2012). Cassava production is currently put at about 33.8 million tons a year (FAO, 2012). Total area harvested of crop in 2001 was 3.1million hectare with an average yield of about 1ton/ha (FAO, 2012). To boost the yield in the level of production in cassava, the use of improve varieties in cassava production arose which led to the use of improved breed. Nweke *et al* (2012) maintained that cassava performs five main roles; famine reserve crop, rural food staple, cash crop for urban consumption, industrial raw materials and foreign exchange earner. Nweke *et al* (2012) also maintained that Nigeria is the most advanced of the African countries poised to diversify the use of cassava on a primary industrial raw material and livestock feed. Two factors provide Nigeria with this comparative advantage in Africa; The rapid adoption of improved cassava varieties and the development of small-scale processing technologies.

It had been suggested that before modern research on cassava started in Nigeria in 1954 at the FDAR, Ibadan, there were numerous local ecotypes of traditional clones. These varied in their tuber yields and general tolerance of prevailing pests and diseases. “Oloronto” (53101), a local cultivar from the Ibadan/Abeokuta area, was then recommended for southern Nigeria. It was later used in 1967 which led to the release of improved varieties such as 60444, 60447 and 60506 for the whole country. In 1972 when cassava bacteria blight (CBB) became a scourge for cassava in the country, only 60306 and a few local types tolerated the disease breeding. IITA later identified improved clones which were released after 1976. (IITA, 2014). Release of the first two IITA clones, namely TMS 30211 and TMS 30395, were rapidly followed by TMS 30572, TMS 30001, TMS 30017, TMS 30337, TMS 30555, TMS 4(2)1425 and others (IITA 2204). These improved varieties differed in their resistance to cassava diseases and pests such as cassava bacterial blight CBB, cassava mosaic virus (CMV), cassava anthracnose disease (CAD), cassava mealy bug (CMB) and cassava green spider mite (CGM). They also produced tubers with varying quality of roots at differing maturity duration and storage in the ground. These improved varieties always gave high yield (D’Situ and K. Bysmouth, 2014).

The goal of agricultural research centers such as the International Institute of Tropical Agriculture (IITA) is to generate technology for improving productivity, farmer’s welfare and household nutritional status. In recent years, there has been growing concern to assess the impact of agricultural research at farmers’ level to determine who benefits from technological change and in what specific ways at both small-scale and societal levels. Yet, the majority of studies on the impact of agricultural research have been carried out within conventional economic frame-works such as benefit-cost analysis, economic surplus models, and economic efficiency estimation Rhodes and Booth, 2017; Jahnke *et al.*, 2017; Campbell and Derow. (2018); Shaner, Philipp, and Schmehl (1982). Within such economic frameworks, little or no attention is given to the actual social impact of technology, that is, the impact of technology on the lives of people, their welfare, their nutritional status, their gender relations, and other social processes in the community. Impact on the lives of resource-poor farmers is probably the most functional benefit of agricultural technologies, and the dominant preoccupation of stakeholder (Jahnke *et al.*, 2017; Ikpi *et al.*, (2016). There is thus a strong need to focus on the adoption impact of agricultural technologies in sub-Saharan Africa where social concerns are higher and more pressing than anywhere else in the world (Derman, and Whiteford, 2013). However, it was



recorded that some factor such as the characteristics of the social system, characteristics of the innovation, characteristics of the innovation channel and the attitude of extension agents determines whether an innovation would be adopted or not. If this is true to what extent does the norms, beliefs, culture, media, complexity, relative advantage, trial-ability /Divisibility of cassava TMS 30572 determines the late adopter and discontinuance of the cassava variety in Iwo Local Government Area? If this is wrong what are the constraint to adoption of the cassava variety in Iwo? The main objective of the study is on determinants of late adopter and discontinuance of cassava TMS 30572 in Iwo ADP zone area while specific Objective were to determine the socio-economic characteristics of cassava TMS 30572 farmers in Iwo ADP zone area, to investigate the factors that influence late adopter and discontinuance of cassava TMS 30572 in Iwo ADP zone area, to determine the relationship between selected socio- economic characteristics variable and level of late adopter and discontinuance of cassava TMS 30572 in Iwo ADP zone area.

It is indicated that most farmers fall into the category of late adopter of this cassava innovation and even some break out from the innovation which fall into discontinuance category. Hence, this study will serve as an educational awareness for the farmers to adopt the innovation in an early stage and eliminate the level and category of discontinuance in the study area. Also, this study will call for private sector and government to invest by cultivating cassava TMS 30572 for the farmers to know the efficient and the impact of the variety by eliminating late adopter and discontinuance in the study area.

2.0 Methodology

2.1 Study Area

The study was carried out in Ejigbo and Iwo Local Government Area of Osun State. These two Local Governments are under the umbrella of Agricultural Development Programme Zone (ADP) in Osun state. Ejigbo is a prominent town in Yoruba Land and the headquarters of Ejigbo Local Government Area. The population is 138,357 according to the GeoNames geographical database (OADP) and had a population of 132,641 at the 2006 census (NPC, 2006). The average annual rainfall is 52.35 inches (1,330 mm), though there are great deviations from this mean value from year to year. Usually, the rainy season lasts from April to October. Farming is the traditional source of economy in Ejigbo. It is based on production of food crops, such as tubers (yam, cassava, cocoyam, potato, etc.), grains (maize, guinea corn), and cowpea; cash crops like cocoa, palm oil, kola-nut, coconut and varieties of fruits.

Modernization has taken farming activities in Ejigbo to a world level. There are large poultry, fisheries and animal husbandry farms (Ogidiolu Farms, Worgor Farms, etc.) in Ejigbo. In 2008, Ejigbo was ranked highest producer of life cat fish in Osun State. Mechanized palm-oil processing plants have taken the place of the manual methods, and land cultivation has been greatly improved (OADP,2006). Iwo is a city in Osun State, Nigeria that is the seat of the Iwo Kingdom, a traditional state. The Iwo people, like all other people of Yoruba stock are said to have belonged to Ile-Ife from where they migrated sometimes in the 14th century. The earliest settlement initiated by Adekola Telu a prince from Ife. Adekola Telu was the son of the 16th Ooni of Ife a female called Luwo Gbagida. The town formerly part of Oyo state was later separated and became one of the major townships in Osun State, Nigeria. It has an area of 245 km² and a population of 191,348 (central city/Local Government) most populous Local Government in Osun State by the 2006 Nigeria National census figures. The town primary economic activity is agriculture with the primary crops being cocoa, yam, corn, cassava, and palm oil.

2.2 Sampling techniques

The study was conducted in Iwo zone of Agricultural Development Programme of Osun state. Iwo zone of ADP comprises of eight Local Government Areas namely: Iwo, Ejigbo, Ola Oluwa, Ayedire, Ayedaade,



Irewole, Isokan and Egbedore L.G.As. Purposive sampling technique was used to select two L.G.As namely: Iwo and Ejigbo L.G.As due to their predominant activity of cassava cultivation.

In the second stage, three communities were purposively selected from each LGA based on their cassava cultivation, making total of six communities. Finally, twenty cassava farmers were randomly selected from each community, given a total of one hundred and twenty (120) cassava farmers from the 2 LGA of Iwo ADP Zone of Osun State. Primary data was collected from the cassava farmers with the use of structured interview schedule. The interview schedule was designed in English Language and interpreted orally to Yoruba Language on the field for illiterate farmers (respondents). The farmers were visited majorly on their Agricultural Extension meeting days which made it possible for adequate interaction and interviewing of the 120 farmers.

2.3 Analytical Technique

Only complete questionnaires were carefully analyzed for the study. Data were analyzed using both descriptive and inferential statistic. The descriptive statistics employed in the study includes Means, Standard deviation, frequencies and percentages. The inferential statistics utilized involve the use of test of significance of correlation coefficient. The correlation analysis was employed to determine the direction of change in the dependent variable brought about by each independent variable.

3.0 Results and Discussion

Socio-economic characteristics of respondents

Table 1a: - Socio-Economic Characteristics of the Respondents (n= 120)

Variable	Frequency	Percentage	Cumulative Frequency
Sex			
Male	111	92	92
Female	9	8	100
Primary Occupation			
Farming	90	75	75
Civil servant	14	12	87
Artisan	11	9	96
Others	5	4	
Religion			
Islam	66	55	97
Christianity	51	42	42
Traditional	3	3	99
Educational Level			
Primary	14	12	12
Secondary	47	39	51
Tertiary	37	31	82
None	22	18	
Marital Status			
Married	1	1	1
Single	117	97	97
Widow	1	1	1
Divorced	1	1	1
Sec Occupation			
fishing	52	43	43
Farmer	26	22	65
Civil servant	19	16	81



Artisan	17	14	95
Trader	6	5	100
Total	120	100	100

Source: Field Survey, 2015

Socio-economic characteristics play an important role in the production and marketing of fresh tomatoes. The socio-economic parameters covered in this section were gender, age, household size, years of experience, educational level, marital status, etc. The result is hereby presented in Table 1a.

Table 1b: - Socio-Economic Characteristics of the Respondents (n= 120)

Variable	Frequency	Percentage	Cumulative Frequency
Land Acquisition			
Inheritance	53	45	45
Purchase	40	33	78
Gift	12	10	88
Leased	15	12	100
Age			
19-34	4	3	3
35-50	43	35	38
51-65	68	57	95
66-80	5	5	100
HHSize			
1-5	28	23	23
6-10	87	73	93
11-15	4	3	99
>15	1	1	100
Experience			
1-10	19	15	15
11-20	31	26	41
21-30	65	55	96
31-40	5	4	100
Farm Size			
1-5	63	53	53
6-10	49	41	94
11-15	7	5	99
16-20	1	1	100
Total	120	100	

Results in Table 1a, shows that most of the respondents are male representing about (92%) of the total number of respondents while the rest (8%) are female. This agrees with the findings of Shu'aib (2009), who found out that traditionally, gender segregation gives room for the division and assignment of responsibilities among people. The respondents were involved in various types of primary occupation such as farming, artisans, civil service, others which indicate specification. Table 1a also shows that majority of the respondents were farmers making about (75%) civil servant (12%) artisan (9%) while the rest (4%) fall to others category. Result in table 1a shows that (42%) of the respondents practice Christianity, (55%) practice Islam, (2%) African tradition worshiper and (1%) are free thinkers. Table 1a shows, out of 120 respondents none or no formal education are (12%), primary education are (39%), secondary education are (31%) and the remaining (18%) had post-secondary education. This is in agreement with the findings of Ayandiji and Adeniyi (2011) who reported that 82.95% of farmers have no formal education; those with secondary education are 15.91% and for those with post-secondary education are 1.14% respondents. Result



in table 1a shows that (1%) fall to single, (97%) were married, (2%) were widowed, and no respondents fall to divorced category. This finding is in consistent with the findings of Ayandiji and Adeniyi (2011) who reported that majority (86.4%) of the tomato farmers in Imeko-Afon LGA were married. Table 1a in result shows that the respondents were involved in various secondary occupations which stated that (43%) are none, (22%) are farmers, (16%) are civil servant, (14%) are artisan and the remaining (5%) are traders.

HHS: House Hold Size; Source: Field Survey, 2015

Table 1b reveals that out of 120 respondent cultivating cassava (TMS 30752), (45%) inherit their land, (33%) purchase their land, (10%) got it as gift while (12%) leased the land which they use to cultivate. Table above represents the age of the respondents. It shows that that (3%) of the respondents fall within range of 19-34years, 35-50years are represented with (35%), (57%) Of respondents falls to the range of 51-65years and 66-80years are range in (5%). This agrees with the position of Adeoye *et.al* (2009) who reported that majority of wholesalers (55%) and retailers (58%) farmers were in the age group of 31 and 40 years of age. The young (18-27) respondents represented 21.7% producers, 4.8% wholesalers, and 11.7% retailers. Only a small proportion of tomato producers (6.2%), wholesalers (4.8%) and retailers (7%) were in the old class. The table reveals that (23%) farmers had a household size between 1-5 people, (73%) takes the largest percentage with people living between 6-10, 11-15 people falls to (3%) and (1%) is greater than 15. This agrees with the findings of Babalola *et.al* (2010), who reported that the mean average household size of farmers stood at 9. The table shows the number of years the respondents have spent in farming. (15%) fall within the range of 1-10years, (26%) between 11-20years, (55%) is the majority range 21-30 and very few (4%) are 31-40years. The number of years the respondents have spent in farm does not have effect on adoption and discontinue process. This is line with the findings of Abimbola (2014) who reported that majority of the farmers (52.3%) in Ogbomosho had between 1 and 10 years of farming experience. Majority (53%) of the farmers have farm size of 1-5 acres, few (41%) of them have farm size of 6-10 acres, very few of the farmers have farm size of 11-15 while only (1%) are 16-20 acres.

Table 2: Relationship between Selected socio- economic Variables and Level of Late Adoption of Cassava TMS 30572 (t-value)

Variables	Late Adopter (t-value)	
	Coefficient	t-value
Sex	0.0040	0.9655
Age	0.0851	0.3557
Level of education	-0.1320	0.1506
Primary occupation	0.0036	0.9689
Secondary occupation	-0.0274	0.7666
Experience	0.0967	0.2939
Farm land acquire	0.1623	0.0765
Farm size	-0.1326	0.1489

Source: Field Survey, 2015



Table 3: Relationship between selected socio-economic variables and level of discontinuance of cassava TMS 30572 (t-value)

Variables	Discontinuance (t-value)	
	Coefficient	t-value
Sex	-0.0670	0.4671
Age	-0.0481	0.6022
Level of education	0.0649	0.4811
Primary occupation	0.0610	0.5079
Secondary occupation	-0.0561	0.5427
Experience	0.1382	0.1322
Farm land acquire	0.1443	0.1159
Farm size	0.0148	0.8728

Source: Field Survey, 2015

3.1 Socio- Economic Factors Influencing Late Adoption and Discontinuance of Cassava TMS 30752

The result in table 4 below shows that, the farmers are still involved in practicing the innovation despite some constrains and difficulties.

Table 4: Distribution of factors that influence discontinuance of TMS

(A)	Behavior of Extension Agent	Frequency	Percent
	Yes	5	4.86
	No	115	95.04
	Total	120	100
(B)	Difficult to understand	Frequency	Percent
	Yes	9	8.26
	No	111	91.74
	Total	120	100
(C)	Production result is low	Frequency	Percent
	Yes	19	16.53
	No	101	83.47
	Total	120	100
(D)	Low materials supply	Frequency	Percent
	Yes	9	8.26
	No	111	91.74
	Total	120	100
(E)	Low Yield	Frequency	Percent
	Yes	20	17.36
	No	100	82.64
	Total	120	100
(E)	Disturbance of pest and disease	Frequency	Percent
	Yes	15	14.00
	No	105	86.00
	Total	120	100
(F)	Culture and environment factor	Frequency	Percent
	Yes	9	7.00
	No	111	93.00
	Total	120	100

Source: Field Survey, 2015

The result which indicates that at each level such as (behavior of extension agent), (difficult to understand), (production is low) etc, majority of farmers still engage in the innovation. This implies that, the level of discontinuance is very low. The percentage of the respondent that said behavior of the extension agent does not influence the factor of discontinuance is 90.54%. Majority (91.74%) of the respondent said that innovation is difficult to understand. 83.47% of the respondent said production result is low is not the factor that influence the discontinuance. 91.74% of the respondent said that low material supply is not the factor that influences the discontinuance. 82.64% of the respondent said that low yield is not the factor that influences the disturbance. 86.00% of the respondent said that disturbance of pest and disease is not the factor that influences the discontinuance. 93.00% of the respondent said that culture and environment factor is not the factor that influences the discontinuance.

Distribution of socio-economic factors influence farmers late Adoption of cassava TMS 30572.

The result in Table 5 below shows that, larger percentage or majority of the respondents adopt the innovation lately, despite that fact that factors indicated in the table is not affecting them such as (behavior of ext. agent), (insufficient fund), (traditional behavior).

Table 5: Distribution of socio-economic factors that Influence Late Adoption

Behaviour of Extension Agent	Frequency	Percentage
Yes	11	9.50
No	109	90.5
Difficult to understand		
Yes	14	12.40
No	106	87.60
Insufficient fund		
Yes	44	37.2
No	76	62.8
Innovation not disseminate well		
Yes	36	30
No	83	70
Traditional behavior		
Yes	11	9.92
No	109	90.08
Innovation not well known		
Yes	28	23.9
No	92	76.1
Root at which innovation known		
Yes	24	19
No	96	81
No interest at first		
Yes	63	53
No	57	47
Total	120	100

Source: Field Survey, 2015

This implies that, the level of late adopter is very high. Majority (90.50%) of the respondent said that behavior of extension agent does not influence the factor of late adopter, 87.60% of the respondent said that innovation is difficult to understand and about 83.47% of the respondent said insufficient funds is not the



factor that influence the late adopter. In terms of dissemination of the innovation, majority (91.74%) of the farmer’s responded as it is poorly disseminated. majority (76.03%) of the respondent indicated that the innovation is not well known and which is not the factor that influences the late adopter. Also, majority (81.00%) of the respondent said that root at which innovation known is not the factor that influences the late adoption while 90.08% of the respondent said that traditional behavior factor is not the factor that influences the late adopter with about 53.00% of the respondent said that they have no interest at first which is the main factor that influence the late adoption in the study area. Table 5 presents the socio-economic factors influencing the adoption of TMS cassava species in the study area;

Test of hypothesis

H₀: There is no significant relationship between the socio- economic characteristics of late adopter and discontinuance of cassava TMS 30752

H₁: There is significant relationship between the socio-economic characteristics of late adopter and discontinuance of cassava TMS 30572

Table 5: Shows the Correlation Coefficient between the Socio- Economic Characteristics and Late Adoption by the Farmers

With the result presented in table 6 below, this study accepts the null (H₀) HYPOTHESIS which stated that there is no significant relationship between the socio-economic characteristics of late adopter of cassava TMS 30572.

Table 6: Late Adopter

Variables	Coefficient (r)	r ²
Sex	0.0040	0.000016
Age	0.0851	0.007242
Education	-0.1320	-0.017424
Primary occupation	0.0036	0.000013
Secondary occupation	-0.0274	-0.000750
Experience	0.0967	0.009350
Farm land acquire	0.1623	0.026341
Farm size	-0.1326	-0.017582

Source: Field Survey, 2015

Table 7: Shows the Correlation Coefficient Between the Socio- Economic Characteristics and Discontinuance by the Farmers. The results presented in table 7 below indicates that the study accepts the null (H₀) HYPOTHESIS which stated that there is no significant relationship between the socio-economic characteristics of discontinuance of cassava TMS 30572.

Table 7: Discontinuance

Variables	Coefficient	r ²
Sex	-0.0670	-0.004489
Age	-0.0481	-0.002313
Education	0.0649	0.004212
Primary occupation	0.0610	0.003721
Secondary occupation	-0.0561	-0.003147
Experience	0.1382	0.019099
Farm land acquire	0.1443	0.020822
Farm size	0.0148	0.000219

Source: Field Survey, 2015



4.0 Summary

This study was conducted to determine the socio-economic characteristics of cassava TMS 30572 farmers in Iwo ADP zone area of Osun State. Two Local Government Areas were purposively selected, out of seven Local Governments Area under Agricultural Development Programme ADP zone. The selected Local Government is Ejigbo and Iwo LGA and three communities were selected from each LGA making six communities which the data was collected. Relevant literature reviewed and information obtained served as guide for the study. Based on the objectives of the study, data were collected from cassava farmers with the use of structured interview schedule.

5.0 Conclusion

The study investigates the factors that influence later adoption and discontinuance which shows that based on the result on the field, majority of farmers in Iwo ADP zone of Osun State adopted the innovation late because (they do not have interest at first), 53% this variable carries high percentage among other variable used, and the result shows in discontinuance variables shows the majority of the farmers do not discontinuance the innovation. The study investigates the relationship between selected socio- economic characteristics variable and level of late adopter and discontinuance of cassava TMS 30572 in Iwo ADP zone area. The extension agent should enlighten the farmers on the profitability of the cassava TMS 30572 in the study area. Farmers should enlighten at the educational level by government and extension agents because cassava TMS 30572 in a breeding type, not local one which farmers are familiar with Government should largely cultivate cassava TMS 30572, for farmers to see and be able to have must interest in the innovation.

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