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EFFECTS OF SOCIO-ECONOMIC FEATURES OF MAIZE FARMERS ON THE ADOPTION OF MAIZE (BUNDLED SERVICES) IN KANO STATE, NIGERIA

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ABSTRACT
The study analyzed the adoption of maize (bundled services) in gender perspectives. The study was conducted in Bagwai and Madobi Local Government Areas of Kano State. A multi-stage sampling technique was used for the selection of 120 maize farmers for this study. Primary data were collected through the use of structured questionnaires and analytical tools used for this study were descriptive and Logit Regression. The result showed that the average age of the farmers was 39 years and majority of them (83.4%) had formal education with 56% of these farmers had farm sizes of 1-2 hectares. The grand adoption score was found to be 69% which was an indication of high adoption of the bundles by the farmers. Results of the logit regression analysis indicated that, factors such as age (0.003), household size (0.033), and extension contact (0.024) were significant at P≤0.01, P≤0.05, and P≤0.1 levels. The study established that most of the improved maize seeds (bundled services) package was adopted by the farmers as revealed by the grand adoption score, the main bundles adopted were; improved maize seeds, and NPK. It was found that late supply of maize bundles, pest and disease and inadequate supply of all packages of the bundle were the major constraints militating against the adoption of the improved maize seeds (bundled service). Therefore, it was recommended that government should ensure timely and adequate supply of the bundles to the farmers before production season in order to enhance the production of the crop on time.

Keywords: Adoption, Bundled services, Sex, Kano, Maize.

INTRODUCTION
Agriculture belongs to the real sector of Nigerian economy. It is described by a large number of small-scale farmers scattered over simple home stead frameworks, low capitalization and low yield per hectare. Agriculture provides employment to Nigerians teeming population, eradicates poverty and contributes to the growth of the economy (Izuchukwu, 2011). The agricultural sector from 2009 till date assumes the first position as at independence. Agriculture currently contributes about 38.4% to Nigeria gross domestic product (National Bureau of Statistics [NBS], 2015).

In another development, maize is an important food and feed crop in Nigeria and remains an important crop for rural food security. The production of the crop must be increased in order to ensure food and income security through the development of improved maize varieties and technologies. Maize is a staple food of great socioeconomic importance in developing countries and it has a wide range of uses these include; baking, brewing industries and livestock feed. Maize is of great economic importance in the sub-Saharan Africa of which Nigeria is inclusive. Introduced in Nigeria in the 16th century, maize is the fourth most consumed cereal ranked below sorghum, millet and rice (FAOSTAT, 2012). It is the third most important cereal after sorghum and millet (Juma, 2010). The total land area planted to maize

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in Nigeria is above 2.5million hectares with an estimated yield of about 1.4 metric tons per hectare. Maize has become indispensable for food security in Nigeria. Maize is, on average the 5th most produced agricultural commodity in the period of 2005-2010, becoming the 3rd most produced crop by quantity in the country during 2009 and 2010, after cassava and yams. Most of the production aims to the domestic market, since a negligible part of the production is formally exported (FAOSTAT, 2012). However, informal trade does occur with neighbouring countries. Much of the maize produced is consumed in a range of commercial sectors. About 50% of the maize produced is consumed by the animal feed sector, with poultry claiming as much as 98% of the total feed produced in Nigeria between 2005 and 2010 (USDA report, 2005-2010). In Nigeria, the demand for maize is increasing at a faster rate daily (Sadiq *et al.*, 2013). This may be due to the fact that the grain is being used for feeding poultry and also serve as the main food for many households (Oguniyi, 2011).

In related development, maize is the second most cultivated crop in Nigeria in terms of area harvested (5.8 million ha, second to Cassava's 7.1 million ha, FAOSTAT, 2014). Nigeria is the second largest maize producer in Africa, after South Africa, with an estimated 10.79 million MT produced in 2014 (FAOSTAT, 2014). Despite its high production volumes, Nigeria's average maize yield of 1.8 MT/ha (FAOSTAT, 2014) is one of the lowest among the top 10 maize producers in Africa. It lags behind countries such as Egypt and South Africa where the yields are 7.7MT/ha and 5.3MT/ha, respectively (FAOSTAT, 2014). Simply by addressing this low yield issue, Nigeria could become the largest maize producer in Africa and one of the largest producers in the world without increasing the area currently used for its cultivation. In Nigeria, the largest volumes of maize are produced in the Northern region, particularly in Kaduna, Borno, Niger, and Taraba and in the South -Western States including in Ogun, Ondo and Oyo. Maize in Nigeria is mainly produced by smallholder farmers, each cultivating an average of 0.65Ha (Sahel Newsletter, 2014). Cropping systems differ from North to South. Northern farmers typically do not practice intercropping. While, in the South, maize is usually intercropped with yam, cassava, guinea corn, rice, cowpea, groundnut, and soybeans. The slow adoption of hybrid seeds, due in part to the smallholder farmers' propensity to recycle their seeds, coupled with the limited availability of improved open-pollinated maize varieties in key maize-growing States is a major limitation to an overall increase in maize yield. In addition, small holder farmers have difficulty gaining access to improved varieties because many input companies are yet to make it readily available. The main objective of the study was to analyze the adoption of improved maize seeds (bundled services) in gender perspectives in Kano State. The specific objectives were to:

i. Describe the socio-economic characteristics of maize farmers;
ii. determine the socio-economic factors that influence the adoption of improved maize seeds (bundled services);
iii. examine the rate of adoption of the improved maize seeds (bundled services); and
iv. describe the constraints militating against the adoption of improved maize seed (bundled services).

MATERIAL AND METHODS

The Study Area

The study was conducted in Kano State. The State was created in July, 1967 and has a total of 44 local government areas (LGAs), divided into three Kano Agricultural Development Project (ADP) zones known as Kano Agricultural and Rural Development Authority (KNARDA). Zone I comprise of 14 LGAs, Zone II comprises of 13 LGAs while zone III has 17 LGAs making a total of 44 LGAs in the State. The production season of maize differs in the

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North and South. The main season in the North is May - October while the main season in the South is March - August. There is usually a second season (August - January) which is rain-fed in the South and irrigated in the North. Harvest is usually done three months after planting. However, the cycles have been affected in recent years by changing weather patterns.

Method of Data Collection

Primary data was used for this study. This was collected with the aid of structured questionnaire administered to adopters of maize innovation (bundle service) in the study area. Information like; services offered. Also, farmer's socio-economic characteristics such as age, Household size, educational level, service experience, access to credit, numbers of extension contact and cooperative membership were collected.

Sampling Techniques and Size

Multi-stage random sampling was used in this work. First stage involved purposive selection of one Local Government Area (LGA) from two administrative zones in Kano State. The basis for such selection was based on the beneficiaries of maize seeds (bundled services) in the 2018 growing season. Thus, Bagwai and Madobi Local Government Areas were purposively being selected from zones II and III. The second stage also involves purposive selection of two communities from each of these Local Government Area with major beneficiaries of the maize seeds (bundled services). There were total of 3,049 beneficiaries of the maize seeds (bundled services) in the State. Lastly, random selection of 100% of the beneficiaries was considered with 70% males and 30% females from each community. Thus, 120 respondents were considered (Table 1) for the study (60 respondents each from Bagwai and Madobi Local Government Area).

Table 1: Sampling Frame and Size

Zone	**LGAs**	**Communities Sample frame (3,049)**	**Sample size (10% of the sample frame)**
Zone II	Bagwai	2	60
Zone III	Madobi	2	60
Total	**2**	**6**	**120**

Method of Data Analysis

Simple descriptive statistics such as mean, frequencies and percentages were used to achieve objectives (I) and (IV). Logit regression model was used to determine the factors that influence the adoption of improved maize variety in the study area, (objective II), adoption score was used to achieve objective (III).

Analytical Techniques

The logit regression model was used to achieve objective part of objective I i.e. determine the factors that influence the adoption of improved maize seeds in the study area. Theoretically, the logit model is expressed as;

$Y = \beta o + \beta 1\ X1 + \beta 2\ X2 + \ldots\ \beta n\ Xn$

where;

Y = Likelihood of Adoption

βo = Intercept

β1 … n = estimated parameters

$X_1 \ldots n$ = set of independent variables

X_1 = Age (years)

X_2 = Sex (male 0, female 1)

X_3 = Year of Education (number of years spent in school)

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X_4 = Household size (number of persons in the household)
X_5 = Farming experience (years)
X_6 = Co-operative membership (if yes 0, 1 if no)
X_7 = Farm size (ha)
X_8 = Extension contacts (number of visit)
X_9 = Access to credit (if yes 0, 1 if no)

RESULTS AND DISCUSSION

Socio-economic Characteristics of Maize Farmers

This was measured by the actual age of the respondent given at the time of the study. The result in Table 2 shows that the average age of the farmers was 39 years with a minimum of 18 years and a maximum of 67 years. The result also revealed that some of the maize farmers (27.5%) were between ages of 40- 46years. This implied that majority of them belong to the middle age classes, who were physically fit to withstand the stress and risks involve in their production, and were mentally aware of the benefits of adopting maize seeds (bundles service). The result is in line with the findings of Okechukwu *et al.* (2015) on "socio-economics of the maize farmers' Adoption of improved maize production technologies in Enugu State, Nigeria" who reported that the dominant age of the respondent was 42 years.

This is considered as the total number of individuals who live together. The result in Table 2 shows that the average household size of the farmers was 10 persons with a minimum of 1 person and a maximum of 30 persons. The result also reveals that 29.2%% of the respondent had household size of 7-10 members. The implication is that the relatively large household size may likely enhance the family labour supply on the farms, hence supporting favorably productive capacities of the farmers supported by their age. The result is in agreement with findings of Nathanel *et al.* (2015) who reported an average household size of 11 persons.

This was measured as years of involvement in farming. The result in Table 2 shows that average years of farming experience was 17 years with a minimum of 1 year and maximum of 35 years respectively. Years of farming experience is important because the higher the farmers' experience in farming, the better will likely be the production capacity of the farmers. This finding is similar to that of Issa *et al.* (2016) who found high farming experience of 10 years and above among maize farmers.

This is the total land area under cultivation by the respondent. The result in Table 2 shows that average farm size of the respondent was 2.8 hectares with a minimum of 1 hectare, maximum of 12 hectares. The result also revealed that more than half (55.8%) of the respondent had farm size ranged from <= 2.00 hectares, the result also reveals that 0.8% of the respondent had farm size ranged from 10-12 hectares. This implied that majority of the farmers were small scale farmers. This finding corroborates that of Jamilu *et al.* (2014) and Issa *et al.* (2016) who found that maize farming is dominated and operated by small scale farmers.

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Table 2: Farmers based on their Age, Household size, farming experience and farm size

Variables	Frequency	Percent	Minimum	Maximum	Mean	Std. dev.
Age (years)			18	67	39.900	1.098
<= 18.00	1	0.8				
19.00 – 25.00	11	9.2				
26.00 – 32.00	25	20.8				
33.00 – 39.00	20	16.7				
40.00 – 46.00	33	27.5				
47.00 – 53.00	12	10.0				
54.00 – 60.00	15	12.5				
61.00 – 67.00	3	2.5				
Total	**120**	**100**				
Household size			1	30	10.87	6.411
<= 2.00	3	2.5				
3.00 – 6.00	33	27.5				
7.00 – 10.00	35	29.2				
11.00 – 14.00	16	13.3				
15.00 - 18.00	14	11.7				
19.00 - 22.00	13	10.8				
23.00 – 26.00	5	4.2				
27.00 – 30.00	1	0.8				
Total	**120**	**100**				
Farming experience (years)			1	35	17.492	1.001
<= 5.00	17	14.2				
6.00 - 11.00	29	28.2				
12.00 – 17.00	13	10.8				
18.00 – 23.00	26	21.7				
24.00 - 29.00	8	6.7				
30.00 – 35.00	27	22.5				
Total	**120**	**100**				
Farm size			1	12	2.82	2.002
<= 2.00	67	55.8				
2.01 - 4.00	32	26.7				
4.01 - 6.00	15	12.5				
6.01 - 8.00	3	2.5				
8.01 - 10.00	2	1.7				
10.01 – 12.00	1	0.8				
Total	**120**	**100**				

Source: Fields survey, 2019.

The result in the Table 3 indicated that most (69.2%) of the respondents were males while 30.8% were females. This shows that males dominated the farming activities in the study area as their source of livelihood and this might be as a result of socio-cultural setting and

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division of labour, where most females are engaged in post-harvest operation. This finding agrees with the findings of Issa *et al.* (2016) who reported that maize farming is male dominated.

This is the ability to read and write whether formal or informal. Education is important in creating positive mental attitude towards adoption of new innovations (Liu *et al.*, 2003). The result in Table 3 indicates that 34.2% of the respondents had secondary education. It was further revealed that 29.2% had primary education, 25% had tertiary education, and 7.5% had Qur'anic education while 4.2% had never been to school. This implied that majority of the respondents had formal education (western) which may positively influence their decision to adopt the bundled services given to them. This negates the findings of Issa *et al.* (2016) that majority of the maize farmers had secondary school education.

Table 3: Distribution of farmers based on their sex, marital status and educational status

Variables	**Frequency**	**Percentage**
Sex		
Male	83	69.2
Female	37	30.8
Total	**120**	**100**
Educational status		
Never been to school	5	4.2
Primary	35	29.2
Secondary	41	34.2
Tertiary	30	25.0
Qur'anic	9	7.5
Total	**120**	**100**

Source: Fields survey, 2019

It was measured by the total number of times the farmers received visits or information from the extension worker. The result in Table 4 reveals that 66.7% of the respondents had access to extension agents while 33.3 had no access to extension agents. This implies that having contact with the extension agents tend to improve farmers productivity, hence enhance farmers ability to efficiently utilize resources. This is in line with findings of Nathanel *et al.* (2015) who reported that majority of both adopters and non-adopters had contact with extension agents to a percentage greater than 60%. The result in Table 4 also indicates that 33.3% of the respondents had contact with extension agents on monthly basis,11.7% had contact on yearly basis while 9.2%, 7.5%, 5.0% of the respondents had contact on weekly, quarterly and daily basis, respectively. This implies that extension agents play an important role in changing the outlook of the farmers which lead to improvement in their standard living.

The result in the Table 4 shows that 58.3% of the respondents had strongly agreed that the presence of extension agents in the study area was very useful while 8.3% agreed that the issue of extension agents in the study area was not useful. This implies that majority of the respondents had agreed that extension agents in the study area plays an important role in changing the outlooks of the farmers.

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Table 4: Farmers based on extension contact, period of interaction and usefulness of contact

Variables	Frequency	Percentage
Extension contacts		
Yes	80	66.7
No	40	33.3
Frequency of visit		
Daily	6	5.0
Weekly	11	9.2
Monthly	40	33.3
Quarterly	9	7.5
Yearly	14	11.7
Total	80	66.7
Usefulness of contact		
Very useful	70	58.3
Useful	10	8.3
Total	80	66.7

Source: Fields survey, 2019.

Rate of Adoption of Improved Maize Seed (bundled services) among Farmers

The result in Table 5 indicates that out of nine bundled services (technologies) disseminated in the study area, improved maize seeds had the mean score of 96% and the least mean adoption score was 46% for agrolizer as it was not given to majority of the respondents. This could be attributed to the extension activities and varietal attributes such as high yielding early maturing and resistant to pest and diseases. The grand mean adoption score was found to be 69 indicating that 69% of the improved maize seed (bundled services) package was adopted by the farmers in the study area. This finding is similar with the findings of Kadafur *et al.* (2020) who reported that 96% as the rate of adoption of improved maize varieties at Ngabu community.

Table 5: Distribution of farmers based on rate of adoption of bundled services

Adoption stage	Seed	Free emergence	Post emergence	Herbicide	NPK	Organic fertilizer	Urea	Agrolizer	Insecticides
Awareness	99	62	63	66	93	59	83	48	75
Interest	96	66	63	68	85	60	79	48	73
Evaluation	92	62	58	65	83	55	78	46	65
Trial	98	63	62	63	85	58	78	44	64
Adoption	94	62	58	63	84	57	74	43	44
Mean Score	96	63	61	65	86	58	79	46	64

Grand Adoption Score = 69

Source: Fields survey, 2019.

Factors Influencing Adoption of Improved Maize Seeds (Bundled Services) among Farmers

The result of logit regression model in Table 6 found that age was significant at 1% level of probability. This implies that age increases the probability of the farmers to adopt more

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of this maize (bundle services). It was due to the fact that experience of farming activities a farmer had acquired and knowledge of different maize (bundle services) helped the farmer to adopt various technologies over a long period of time. Household size was significant at 5% level of probability, meaning that a unit increase in household size (number) will lead to an increase in the adoption of maize technologies in the study area. This corroborates the findings of Sennuga, *et al.* (2020) who reported a positive and significant relationship between household size and technology adoption. Extension contact was also positive and significant at 5% level of probability. This could be from the fact that extension workers provide relevant information to farmers on new and improved maize (bundle services). This result is similar to the findings of Nathanel *et al.* (2015) who also reported age, number of extension contacts, income, years of participation in association farm size as some of the significant factors influencing the adoption of early maturing maize varieties.

Table 6: Factors influencing adoption of improved maize seeds (bundled services)

Independent variables	Coefficient	Std. Error.	Significant.
Constant	2.379	1.122	0.034
Age	-0.102	0.035	0.003***
Sex	0.837	0.553	0.131
Household Size(no.)	0.108	0.051	0.033**
Educational Status	0.744	0.837	0.374
Farming Experience (yrs.)	-0.006	0.027	0.824
Farm Size (ha)	-0.338	0.219	0.123
Extension Contact	1.317	0.585	0.024**
Access Credit	-0.266	0.584	0.649
Log Likelihood	118.193		
Chi-square	37.503		

***1% level of significance, **5% level of significance *10% level of significance
Source: Fields survey, 2019.

Constraint militating against the Adoption of Improved Maize Seeds among Farmers

The result in Table 7 revealed that the most common constraints to adoption of improved maize seeds (bundled services) in the study areas were late supply of the bundles (87.5%), pest and disease (35%) and inadequate supply of the bundles (45.8%) i.e. not all the technologies are being given to the all the farmer. This finding is similar to the findings of Umar *et al.* (2014) and Kadafur *et al.* (2020) that unavailability of seed was the major constraints to maize production.

Table 7: Farmers based on constraints to adoption of maize seeds (bundled services)

S/N	Constraint	Frequency	Percentage	Rank
1	Late supply of bundles	105	87.5	1st
2	Pest and diseases	42	35	2nd
3	Inadequate supply of all the bundles	55	45.8	3rd

CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study it indicated that most of the improved maize seeds (bundled services) package was adopted by the farmers as revealed by the grand adoption score, the main bundles adopted were; improved maize seeds, and NPK. The study also concludes

that sex, educational status, farming experience, farm size and access to credit does not encourage adoption of maize bundled services. The study has also shown that late supply of the bundles, pest and disease and inadequate supply of all bundles to each respondent were the major constraints to farmers' ability to meet their optimum production in the study area. Based on the findings of this study, the following recommendations were drawn:

1. Improved seeds, fertilizers, herbicides were among the major inputs that positively and significantly influence maize production in the study area. Therefore, government should ensure timely and adequate supply of the bundles to the farmers before production season in order to enhance the production of the crop on time and in abundance.
2. Extension contact in the state should be improved as the agent plays an important role in disseminating information to the farmers pertaining their production.

REFERENCES

Catalysing Sustainable Agriculture and Nutrition (2017). Maize: Enhancing the Livelihoods of Nigerian Farmers, *Sahel Newsletter* 14(1). Retrieved from https://sahelcp.com.

FAOSTAT (2012). *Top Maize Production.* Retrieved May 2021 from www.faosta.fao.org

FAOSTAT (2014). *World Food and Agriculture, Agricultural Production Statistics 2012.* Food and Agriculture Organization Statistics Division, Rome. FAO Statistics Division (http://faostat3.fao.org)InternationalGrainsCouncil(http://www.igc.int/en/grainsupdate /sd.aspx?crop=Maize) Leff, B. et al., 'Global distribution of major crops around the world', *Global Biogeochemical Cycles*, 2014, 18(GB1009).

Issa, F. O., Kagbu, J. H. and Abdulkadir, S. A. (2016). Analysis of Socio-Economic Factors Influencing Farmers' Adoption of Improved Maize Production Practices in Ikara Local Government Area of Kaduna State, Nigeria. *Agrosearch,* 16(2), 15-24.

Izuchukwu, O. (2011). Analysis of the Contribution of Agricultural Sector on the Nigerian Economic Development. *World Review of Business Research,* 1 (1), 191 – 200.

Jamilu, A. A., Abdul-Aziz, H., Jafaru, A. K., Sani, B. M. and Abudu, S. (2014). Factors Influencing the Adoption of Sasakawa Global 2000 Maize Production Technologies among Smallholder Farmers in Kaduna State, Nigeria. *Journal of Agricultural Extension,* 18(1), 73-83.

Juma, C. (2010). The New Harvest: Agricultural Innovation in Africa. Oxford University Press. Pp. 56.

Kadafur, I. M., Idrisa, Y. L. and Shehu, A. (2020). Adoption of Improved Maize Varieties in Northern Guinea Savannah of Borno State, Nigeria. *Journal of Agricultural Extension,* 24 (1), 34-41.

Liu, C. and Lian, Z. (2003). Influence of Acrida cinerea Replaci8ng Peru Fish Meal on Growth Performance of Broiler Chicken. *Journal of Economic Animal,* 7(1): 48-51.

Nathanel, N. N., Abdulsalam, Z., Rahman, S. A. and Abdoulaye, T. (2015). Socio-economic Factors Affecting Adoption of Early Maturing Maize Varieties by Small Scale Farmers in Safana Local Government Area of Katsina State, Nigeria. *Journal of Development and Agricultural Economics,* 7(8): 274-282.

National Bureau of Statistics (2015). NBS Quarterly Reports.

Ogunniyi, L. T. (2011). Household Consumption of Cassava Products in Oyo State. *Global Journal of Science Frontier Research,* 11(6), 38-44.

Okechukwu, E. C, Ezeaku, I. E., Mbah, B. N. and Baiyeri, K. P. (*2015*). Integrated crop livestock farming system for sustainable agricultural production in Nigeria. *African Journal of Agricultural Research,* 18 (2), 97 – 110.

Sadiq, M. S., Yakasai, M. T., Ahmad, M. M., Lakpene, T. Y. and Abubakar, M. (2013). Profitability and Production Efficiency of Small-Scale Maize Production in Niger State, Nigeria. *IOSR Journal of Applied Physics (IOSR-JAP)*, 3(4), 19-23.

Sennuga, S. O., Fadiji, T. O. and Thaddeus, H. (2020). Factors Influencing Adoption of Improved Agricultural Technologies (IATs) among Smallholder Farmers in Kaduna State, Nigeria. *International Journal of Agricultural Education and Extension*, 6(2), 382-391.

Umar, S., Musa, M. W. and Kamsang, L. (2014). Determinant of Adoption of Improved Maize Varieties among Resource Poor Household in Kano and Katsina State, Nigeria. *Journal of Agricultural Extension*, 18(2), 115-124.

USDA (2010). Foreign Agricultural Service Gain Report (Global Agriculture Information Network), Nigeria Grain and Feed Annual-Nigeria's Wheat Imports Surge, 2010 (www.fas.usda.gov).