Assessment of Farmers Perception and Adoption of Rice Production Technologies in Chikun Local Government Area of Kaduna State

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Abstract

The study Assessed Farmers Perception and Adoption of Rice Production Technologies in Chikun Local Government Area of Kaduna State. Purposive sampling technique was used to select eighty-two (82) rice farmers in the identified districts. Primary data were collected using well-structured questionnaires. Descriptive statistics and Likert type scale were used to achieve the stated objectives of the study. majority (32.9%) of the respondents were within the age range of between 41-50 years, (72%) of the respondents are male and with at least secondary school education and are full fledge farmers. More so, as regards adoption of technologies, the study revealed that at one time or the other the respondents had adopted at least one new technology which over the years of using local processing methods had resulted in low quality produce but with the use of new technologies like paddy cleaner, destoner, husker, paddy separator e.t.c rice production had produced cleaner, better quality and increase production in the production of the local rice in the study area,. Perception mean scores of rice production in the study area revealed; low market patronage with a mean scores of ($\bar{X}$ = 9.82) was agreed to be a major factor influencing rice production in the area, cheaper to foreign rice with a mean score of ($\bar{X}$ = 4.56), Highly nutritious with mean score ($\bar{X}$ = 4.22), Better taste with means score ($\bar{X}$= 4.09), Respondents disagree that processing is easy with mean score of ($\bar{X}$= 2.56) in Local rice production in the study area, this negatively influenced respondent's perception. Based on the findings of the study the following recommendations were made; that farmers should form themselves into cooperative societies so that they can access loans and credit facilities. Research institutes, universities e.t.c should collaborate to develop improved disease resistant varieties of rice; improved rice processing technologies; Government should also enact policies that protect the local production of rice, make it lucrative and purchase excess rice produce during market glut from the farmers; ensure provision of subsidized, timely supply of agro-chemicals that will help manage the problem of pest infestation associated with local rice production in the study area.

Keywords: Perception, Adoption, Rice production

Introduction

Rice, botanically called Oryzae is relatively an Agricultural grain grown and consumed as staple food in Nigeria and other parts of the world (Ajijola, *et al*, 2012), usually adopted for growth in tropical and sub-tropical regions of most continents, usually cultivated under widely different conditions because of its great cultural diversity.

Singh *et al*. (2014) revealed that Conservation agriculture (CA) technologies are the future of sustainable agriculture, he suggested acceleration of CA based technologies can reduce the labour requirement as well as reduce the drudgery of farmers. In Bihar, efforts to adopt and promote conservation agriculture have been underway for nearly a decade but it is only in the last 8- 10 years that the technologies are finding rapid acceptance by farmers. Efforts to develop and spread conservation agriculture have been made through the combined efforts of several State Agricultural Universities, ICAR institutes and the Rice-Wheat Consortium for the Indo-Gangetic Plains (Joshi, 2011). The spread of technologies is taking place in India in the irrigated regions in the Indo-Gangetic plains where rice-wheat cropping systems dominate. Conservation agriculture systems have not been tried or promoted in other major agro-ecoregions like rainfed semi-arid tropics and the arid regions of the mountain agro- ecosystems (Bhan and Behera, 2014)

Rice has been an important food for most people in sub-Saharan Africa particularly West Africa where the consumption of cereals mainly sorghum and millet has decreased while that of rice has increased as a result of shift in consumers' preference, urbanization and increase in population. Where 77% of the farmed area of rice is rain-fed, of which 47% is lowland and 30 percent upland (Cadoni and Angelucci, 2013). In Nigeria, demand for rice had been increasing at a much faster rate than in any other African countries since mid-1970 (FAO, 2001).

In Nigeria, rice is a diet of an estimated population of 180 million consumers and it is cultivated widely across the states, extending from the North to the South with most of it grown and consumed in the extreme North at (Kano and Borno), middle belt at (Benue, Kaduna, Niger and Taraba States and South East at (Ebony and Enugu State). Significantly, the physical appearance and brand of rice is equally important as they determine what type of menu consumers embrace and use for menu preparation. Interestingly, it is argued that taste, neatness, quick cooking, colour and stickiness after cooking are some of the factors that trigger consumers' preference for certain types of rice where available (Ogundele, 2014; Emodi and Madukwe, 2011). However, the choice of local rice for household and general consumption varies across different geo political zone of Nigeria.

However, domestic rice production has not increased sufficiently to meet the increased demand despite the various policy measures put in place to facilitate production, the high cost of importation in recent years has highlighted the desire by the government to discourage import substitution by encouraging increased local production. However, locally produced rice at present is uncompetitive in the market because its value chain is fragmented and cannot offer a standard. The un-competitiveness is caused by poor processing and low marketing interest as well as poor quality as a result of extraneous material such as stones and debris. Thus, consumers are weary of picking stones from local rice. Secondly because most operations are manual, cost of production is also high Thus, perceived quality, among others could be the variable that if enhanced, could lead to increased choice of rice by consumers.

This study evaluate the perception of rural farmers towards local rice production in Chikun Local Government Area of Kaduna State, while the specific objectives were to: Identify the socio-economic characteristics of local rice producers; identify the technologies adopted in local rice production in the area; understand farmers perception on local rice production in the study area; find out the level of adoption of the identified technologies in local rice production in the area; and identify the constraints associated with local rice production in the study area?

Methodology

The study was carried out in Chikun Local Government Area (LGA) of Kaduna State, covering an area of about 445,659 km, on longitude 10^0N and 8^0E of the equator. Its situated in the Northern Guinea Savanna Zone, and shares boundaries with Igabi and Kaduna South LGA to the North and with Kajuru to the East, Birnin Gwari and Giwa LGA to the West and Kachia LGA to the South. The predominant ethnic group is Gbagyi while Hausa, Kataf, Igbo, Fulani and Yoruba tribes are also present, economic activities include, trading, animal rearing and poultry farming, food, vegetable and cash crop production

Primary data was used for the study, collected through the use of well-structured questionnaires. Five districts were purposively selected and eighty-two (82) rice farmers in the districts were randomly identified. Descriptive statistics was used to analyze 'the socio-economic

characteristics of respondents; identify the available technologies used in rice production in the study area while 5 point likert-type scale was used to estimate the stated objectives of identifying farmers perception of rice production in the study area,; Level of adoption of identified technologies and Constraints to local rice production in the study area'.

The 5 point likert-type scale of identifying farmers perception of rice production; was in the range of Strongly Agreed (SA): Agreed (A): Undecided (U): Disagreed (D) and Strongly Disagreed (SD) with a 3.0 cut-off mean score for decision. Any mean score below 3.0 is categorized as 'Disagreed' while any score equal or above 3.0 is categorized as 'Agreed'. As regards level of adoption of identified technologies, the scale was in the range of Adopt (AD); Tried (T); Evaluate (E); Aware (AW); and Not Adopt (NA). Also for the Constraints to local rice production in the study area, the 5-point likert scale is in the range of Very Serious (VS); Serious (S); Undecided (UD); Not a serious problem (NS) and Not a Problem (NP). The cut-off point for decision is 3.0.

The sum divided by the total number of respondents gives the mean score for the likert type scale.

Result and Discussion

Socio-economic characteristics of the Farmers

The study revealed that 32.9%, 28.0%, 18.3%, 14.6% of the respondents' were within the age range of 41-50years, 31-40years, 21-30years, those above 51 years of age, while about 6.1.% of the respondent falls within the age range of 11-20years.

Furthermore, majority (72.0%) of the respondents were male, while 28.0% were female. This revealed that males are more involved in the farming of local rice than female in the study area. This result is similar with that of Maisamari (2008) which indicated that men are more involved in activities that require exertion of strength than females.

In addition, 45.1% of the respondents had secondary education, about 20.7% had tertiary education, while 19.5% had non- formal education, 11.0% had primary education, while 3.7% of the respondents had qur'anic education, this indicated that local rice production farming is more attractive to people with lower academic qualification than those with higher qualifications.

The analysis showed that 56.1% of respondents are full fledge farmers, 23.2% are into trading, about 9.8% of the respondents are civil servant, 6.1% are students, and 4.9% of the respondents are into craft, this showed that majority of the respondents are mostly farmers while few others are civil servant, artisans and students.

Available technologies adopted in local rice production in the study area

The table below revealed that majority of the respondent's (19.51%) had at one time or the other adopted at least one or more technology/ies to improve their rice production in the study area, few farmers still engage in the drudgery Manual method maybe because of the financial implication, 10.98% adopted use of Agro chemical, 8.54% of the respondents adopted the use of Tractor, while 7.32% of the respondents used Thresher, 6.10% of the respondents adopted use of

Improved seed varieties, about 3.66% adopted the use of Harvester at one time or the other, 2.44% adopted the use of Planter. This result showed that the respondents in the study area had adopted at least one new technology in the processing and production of their local rice at one time or the other.

Table 1: Distribution of respondents according to their Socio-economic characteristics

Socioeconomic characteristics	Frequency	Percentage (%)
Age		
11-20	5	6.1
21-30	15	18.3
31-40	23	28.0
41-50	27	32.9
Above 51	12	14.6
Gender		
Male	59	72.0
Female	23	28.0
Educational level		
Non- formal	16	19.5
Quranic	3	3.7
Primary	9	11.0
Secondary	37	45.1
Tertiary	17	20.7
Occupation		
Trading	19	23.2
Civil service	8	9.8
Craftiness	4	4.9
Farming	46	56.1
Student	5	6.1
Total	82	100.0

Source: Field survey, 2019

Table 2: Adopted Technologies in the Study Area

Technologies	Frequency	Percentage
Agro chemical	9	10.98
Improve seed varieties	5	6.10
Tractor	7	8.54
Harvester	3	3.66
Thresher	6	7.32
Planter	2	2.44

Source: Field survey, 2019
**Multiple response

Farmers perception on rice production in the study area

The table below revealed the perception mean scores on rice production in the study area, low market patronage has a mean score of ($\bar{X}$ = 9.82) and was perceived to be a major factor influencing rice production in the area, this may be due to majority of Nigerians preference for foreign rice, hence the Federal Government ban on the importation of foreign rice so as to grow the local production of rice, other factors include; Cheaper to foreign rice with a mean score of ($\bar{X}$ = 4.56), this may be due to the fact that some local rice has stones and other dirts after processing, thus making the consumers prefer foreign rice, Highly nutritious with mean score ($\bar{X}$ = 4.22), Stressful production process with mean score of ($\bar{X}$= 4.21), Better taste with means score ($\bar{X}$= 4.09), local rice tastes better compared to foreign rice while generating good income and improve children's education had mean score ($\bar{X}$ = 3.76) respectively.
Respondents disagree that 'processing is easy' with mean score of ($\bar{X}$= 2.56), thereby negatively influencing respondents perception of local rice production in the study area.

Table 3 Perception of Respondents on Rice Production in the Study Area

Variables	SA	A	U	D	SD	Sum	Mean	Remark
Cheaper to foreign rice	48 (58.5)	33 (40.2)	-	1 (1.2)	-	374	4.56	A
Stressful production process	25 (30.5)	51 (62.2)	4 (4.9)	2 (2.4)	-	345	4.21	A
Low market patronage	24 (29.3)	36 (43.9)	6 (7.3)	15 (18.3)	1 (1.2)	805	9.82	A
Generate good income	8 (9.8)	56 (68.3)	8 (9.8)	10 (12.2)	-	308	3.76	A
Improve children education	4 (4.9)	64 (78.0)	10 (12.2)	4 (4.9)	-	308	3.76	A
Better health facility	3 (3.7)	58 (70.7)	13 (15.9)	8 (9.8)	-	302	3.68	A
Highly nutritious	27 (32.9)	48 (58.5)	5 (6.1)	6 (2.4)	-	346	4.22	A
Better taste	22 (26.8)	50 (61.0)	5 (6.1)	5 (6.1)	-	335	4.09	A
Processing is easy	4	23	1	41	13	210	2.56	D

Source: Field survey, 2019
Figures in parentices are percentages.
Cut off mean for decision =3.0
SA=Strongly Agreed; A=Agreed; U= Undecided; D=Disagreed; SD=strongly disagreed

Level of adoption of identified technologies in local rice production in the area

Table 4 of the study revealed the level of adoption of the identified technologies in Rice production, Parboiling was adopted with the mean value of ($\bar{X}$=4.52) followed by Milling

machine with the mean value of ($\bar{X}$ = 4.48). The level of adoption of weed control had a mean value of ($\bar{X}$ =4.32), also Mechanical had ($\bar{X}$= 4.25), use of sprayer had ($\bar{X}$=3.83), and winnower had a mean value of ($\bar{X}$ =3.62).

On the other hand, despite the fact that respondents were Aware of, had shown Interest which would have led them to make more enquiries about the technologies and actually Evaluated/considered the benefits and demerits and may have probably gave a Trial at one time or the other, the following technologies: use of Tractor with a mean score of ($\bar{X}$= 2.63); Thresher with mean value of ($\bar{X}$ = 2.56), Fertilizer Applicator with a mean value of ($\bar{X}$ = 2.51), Harvester with a mean value of ($\bar{X}$ =2.20) and Transplant machine with a mean value of ($\bar{X}$ = 1.73) were not widely adopted in the study area probably as a result of their required technical-know-how, high cost and maintenance, had negative effect may be because of the high financial implication, which majority of the respondents may not be able to afford, this could be overcome if respondents formed themselves into cooperative groups and jointly pursue their goals.

Table 4 Adoption of identified Technologies in Local Rice

Variables	AD	T	E	AW	NA	Sum	Mean	Remark	Rank
Use of tractor/planter	8 (9.8)	13 (15.9)	4 (4.9)	55 (67.1)	2 (2.4)	216	2.63	D	7
Trans plant machine	3 (3.7)	2 (2.4)	5 (6.1)	32 (39.0)	40 (48.8)	142	1.73	D	11
Fertilizer Applicator	24 (29.3)	1 (1.2)	3 (3.7)	19 (23.2)	35 (48.8)	206	2.51	D	9
Weed control	58 (70.7)	4 (4.9)	8 (9.8)	12 (14.6)		354	4.32	A	3
Use of sprayer	64 (78.0)	1 (1.2)	2 (2.4)	12 (14.6)	3 (3.7)	307	3.83	A	5
Harvester	8 (9.8)	6 (7.3)	4 (4.9)	40 (48.8)	24 (29.3)	180	2.20	D	10
Thresher	10 (12.2)	11 (13.4)	2 (2.4)	51 (62.2)	8 (9.8)	210	2.56	D	8
Winnower	40 (48.8)	10 (12.2)	1 (1.2)	23 (28.0)	8 (9.8)	297	3.62	A	6
Mechanical	59 (72.0)	6 (7.3)	2 (2.4)	9 (11.0)	6 (7.3)	349	4.25	A	4
Parboiling	5 (81.7)	3 (3.7)	12 (14.6)			371	4.52	A	1
Milling machine	64 (98.0)	6 (7.3)	2 (2.4)	8 (9.8)	2 (24)	368	4.48	A	2

Source: Field survey, 2019
Figures in parentices are percentages.
Cut off mean for decision =3.0
AD= Adopt; T=Tried; E= Evaluate; AW=Aware; NA=Not Adopt

Constraints to local rice production in the study area.

Table 5 revealed the constraints in local rice production as perceived by respondents, Pest and disease infestation was identified as the major constraint with mean value of ($\bar{X}$=4.58) followed by fluctuation in price with the mean value of ($\bar{X}$=4.02). Insufficient land for rice production had a mean value of ($\bar{X}$=3.93), Insufficient mechanization had ($\bar{X}$ =3.93), scarcity/high cost of input for rice production had a mean value of ($\bar{X}$=3.92). On the other hand, Inadequate access to agricultural Information had mean value of ($\bar{X}$=3.86), Lack of standard mill had a score of ($\bar{X}$=3.82), Weak market information had a mean value of ($\bar{X}$ =3.80), Poor access to improved rice production had mean score of ($\bar{X}$=3.63), Poor soil fertility had a mean value of ($\bar{X}$ =3.62), this maybe as a result of the soil type and the topography of the area. Furthermore, Insufficient extension agent contact had a mean value ($\bar{X}$=3.53), Access to credit had a mean value of ($\bar{X}$=3.52), Bad roads had a mean value of ($\bar{X}$=3.47), Insufficient technical knowhow had a mean value of ($\bar{X}$ =3.08), Poor health status had a mean value of ($\bar{X}$=3.08), Low output quality had a mean value of ($\bar{X}$= 2.98), Lack of fragmentation had a mean value of ($\bar{X}$= 2.98), and Knowledge of rice variety had a mean value of ($\bar{X}$ =2.91).Pest and disease and price fluctuation were the two major factors limiting growth in rice production. Pest and disease incidence damage, vary widely according to location and season so that knowledge of pest ecology and dynamics is therefore necessary to allow farmers to take appropriate action to manage their rice crops effectively. It is anticipated that intensification of rice production will lead to an increase in the significance of diseases, particularly the fungal disease (rice blast), as production constraints. Fungicide application is almost non-existence in most of the African rice-based farming systems therefore, planting resistance rice varieties is considered to be the most effective way of combating the disease

Conclusion and Recommendations

The study evaluates perception of farmers to local rice production in Chikun Local Government Area of Kaduna State, majority of the farmers age ranges between 41-50 years (32.9%), predominantly males (72.0%) and had at least secondary school education (45.1%). Majority of the respondents endorsed the use of Agro-chemical (10.98%). Low market patronage with a mean score of ($\bar{X}$ = 9.82) was perceived to be a major factor influencing rice production in the area, cheaper and high nutritional content compared to the foreign are also perceived to influence respondents decision in local rice production in the area. Improved parboiling technologies ($\bar{X}$=4.52) and milling machine ($\bar{X}$ = 4.48) were agreed to be highly Adopted. Major constraints are Pest and Diseases infestation ($\bar{X}$=4.58), Fluctuation or Instability in market price of rice and its other production inputs ($\bar{X}$=4.02) were identified as major constraints influencing rice production in the study area
The following recommendations were made based on the findings of the study; that farmers should form themselves into cooperative societies so that they can access loans and credit facilities, arrange education and lectures for members so that they can improve on their production.
Research institutes, universities e.t.c should collaborate in other to develop and ensure availability of improved disease resistant varieties of rice; improved rice processing technologies that will lead to availability good quality rice;

Government should also enact policies that protect the local production of rice, make it lucrative by ensuring price stability and purchase excess rice produce during market glut from the farmers; ensure provision of subsidized, timely supply of agro-chemicals that will help manage the problem of pest infestation associated with local rice production in the study area; There is need for increase presence of Agricultural Extension personnel's to teach rice farmers ways of processing and improve rice production so as to minimize loses, ensure better cleanliness and improve quality and help provide food and job for the teeming populace.

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Table 5 Constraints to Rice Production

Variables	VS	S	UD	NS	NP	Sum	Mean	Remark
Pest and disease infestation	55 (67.1)	22 (26.8)	3 (3.7)	2 (2.4)		376	4.58	A
Scarcity high cost input	23 (28.0)	43 (52.4)	6 (7.3)	10 (12.2)		325	3.92	A
Insufficient land	15 (18.3)	56 (68.3)	4 (4.9)	5 (6.1)	2 (2.1)	323	3.93	A
Insufficient Ext. Agent Contact	9 (11.6)	50 (61.0)	4 (4.9)	18 (22.0)	1 (1.2)	290	3.53	A
Access to credit	12 (14.6)	42 (51.2)	9 (11.0)	15 (18.3)	4 (4.8)	289	3.52	A
Bad roads	19 (23.2)	35 (42.1)	2 (2.4)	18 (22.0)	8 (9.8)	285	3.47	A
Insufficient technical know How	12 (14.6)	21 (32.9)	7 (8.5)	28 (34.1)	8 (9.8)	253	3.08	A
Weak market information	8 (9.8)	26 (31.7)	6 (7.3)	27 (32.9)	14 (11.1)	230	3.80	D
Low output quality	18 (22.0)	33 (40.2)	5 (6.1)	18 (22.1)	8 (9.8)	245	2.98	D
Insufficient mech	21 (25.6)	42 (51.2)	3 (3.7)	9 (11.0)	7 (8.5)	307	3.93	A
Inadequate access to agric Info	11 (13.4)	47 (57.3)	9 (11.0)	9 (11.0)	6 (7.3)	269 269	3.86	A
Poor access to improved	19 (13.2)	39 (47.6)	3 (3.7)	16 (19.1)	5 (6.1)	297	3.63	A
Price fluctuation	43 (52.1)	18 (22.0)	5 (6.1)	12 (14.6)	4 (4.9)	330	4.02	A
Lack of standard mill	23 (28.0)	41 (50.0)	3 (3.7)	11 (13.4)	4 (4.9)	314	3.82	A
Lack of fragmentation	9 (11.0)	26 (31.1)	10 (12.2)	29 (35.4)	1 (9.8)	245	2.98	D
Poor health status	12 (14.6)	22 (26.8)	13 (15.9)	28 (34.1)	7 (8.5)	250	3.08	A
Knowledge of rice variety	12 (14.6)	28 (34.1)	3 (3.7)	19 (23.2)	20 (24.4)	239	2.91	D
Poor soil fertility	9 (11.0)	42 (51.2)	3 (3.7)	17 (20.7)	11 (13.4)	297	3.62	A

Source: Field survey, 2019