



PERCEPTIONAL ANALYSIS OF RISK-CAUSING FACTORS ON FARMERS' ADOPTION BEHAVIOUR TOWARDS SUSTAINABLE FOOD CROP PRODUCTION TECHNOLOGIES IN NIGERIA

¹Alfred, S.D.Y., ¹Epherayire, E., ¹Odefadehan, O.O. and ²Oduntan, O.

¹Department of Agricultural Extension and Communication Technology, Federal University of Technology, Akure, Nigeria

²Department of Agricultural Resource Economics, Federal University of Technology, Akure, Nigeria

Correspondence contact details: simmydalf@yahoo.com

ABSTRACT

The study investigated the perceived risk-causing factors that affect adoption behaviour of crop farmers towards production technologies. The study was carried out in Delta State, Nigeria. With the aid of an interview schedule, 120 food crop farmers were multistage-randomly sampled. The study identified risk-causing factors as; production risk, price or market risk, financial and credit risk, institutional risk, technology and personal risks. The study showed that among the risk-causing factors ascertained, it is the economic and financial factors that were found to be regular factors, while environment, production and institutional factors were occasional factors. The farmers have high adoptive behaviour for improved land preparation ($\bar{x}=2.47$), planting of early season crops ($\bar{x}=2.7$), Use of improved processing techniques ($\bar{x}=2.34$), and crop rotation ($\bar{x}=2.33$). Low adoptive behaviour was exhibited for chemical pests control device ($\bar{x}=1.01$), use of modern packaging techniques ($\bar{x}=0.74$), biological control of pest ($\bar{x}=0.31$), use of modern harvesting equipment ($\bar{x}=0.37$), and the use of modern storage technologies ($\bar{x}=0.51$). Further result of the study showed that the farmers perceived some risk-causing factors as having high and significant effects on their adoption behaviour towards production technologies. More than 50% of the identified risk-causing factors were perceived by the farmers to have effect on their adoption behaviour. The study subsequently recommends that more extension agents should be employed by the government, and farmers should have access to credit and capital opportunities.

Keywords: Risk-causing factors, farmers, adoption behaviour and agricultural extension

INTRODUCTION

Agricultural risks are prevalent throughout the world and are a source of great concern among rural farmers in the developing countries who are characterised by scattered small land holdings, family labour, negligible capital investment, little or no savings or storage facilities (Okuneye, 2002). On a daily basis, farmers are confronted with challenges that affect their output, income and which technologies to use. Consequently, decisions or events are often not known with certainty until they occur.

Risk is the possibility of adversity or loss consequent to decisions taken over an event. Most of agricultural decisions are taken in the environment of risks and uncertainty. Explicitly, farmers have to make decisions now that will affect their production later. In making decisions, the farmers may not be aware of certain factors such as government policies, weather variability, changes in technology and some others that make it difficult for them to predict the future with certainty.

Farmers are unable to take actions which will ameliorate their level of poverty because they are poor. If poor people are risk-averse to the extent that they are unwilling to invest in the acquisition of modern assets because that involves risk taking, they will remain poor (Mosley *et al.*, 2003). If farmers must be assisted to increase production for the ever-increasing population, a study assessing the risk-causing factors in food farmers' adoption behaviour toward production technologies is imperative.

The study specifically examined the farmers' socio-economic characteristics; identified risk-causing factors faced by the farmers, ascertained the farmers' perception of the risk-causing factors and determined the effect of risk-causing factors on farmers' adoption behaviour.

METHODOLOGY

The study was carried out in Delta State, Nigeria. A multistage sampling technique was used to collect the data for the study. For the first stage, two local government areas (LGA) were purposively selected for their high level of food crop production (Ughelli South and Udu). At the second stage, three communities were selected from each of the two LGAs (Otujeremi, Okwagba and Ekakpamne from Ughelli South; Ubogo, Ukpiovwin and Ujevwu from Udu LGA) and lastly, 20 farmers were selected from each selected community giving a total of 120 respondents. Data were collected using a validated interview schedule. Data was analysed using both descriptive and inferential statistics.

RESULTS AND DISCUSSION

The respondents were made up of 55% female and 44% male (Table 1). The prevailing tradition in the study area was that more of female than male are into farming. The average age of the respondents was also found to be 47 years. About 60% of the respondents had one form of formal education or the other, while a larger percentage (95%) had been in farming enterprise for not less

than five years. Level of farmer education and years of farming would enable the respondents to

be able to interpret risk-causing factors as they affect their farming enterprises.

Table 1: Socioeconomic characteristics of respondents (N = 120)

Socioeconomic characteristics	Options	Frequency	Percentage	Mean
Sex	Male	54	45	
	Female	66	55	
Age (years)	20-29	17	14.2	
	30-39	17	14.2	
	40-49	37	30.8	47
	50 – 59	20	16.7	
	≥60	29	24.2	
Marital Status	Single	23	19.2	
	Married	63	52.5	
	Divorced	3	2.5	
	Widowed	24	20.0	
	Separated	7	5.8	
	Educational status	No formal education	38	31.7
Adult education		10	8.3	
Primary education		19	15.8	
Secondary education		35	29.2	
Tertiary education		18	15.0	
Religion	Christian	89	74.2	
	Muslim	-	-	
	Traditional	31	25.8	
Household size	< 5	15	12.5	
	5 – 9	91	75.8	6
	≥ 10	14	11.6	
Farming experience (years)	< 5	6	5.0	
	5 – 9	28	23.3	
	10 -19	32	26.7	16
	20-39	45	37.5	
	≥ 40	9	7.5	
Farm size (ha)	< 1	40	33.3	
	1.0 – 2.9	59	49.2	1
	≥3	21	17.5	
Acquisition of farm land	Family	38	31.7	
	Inherited	31	25.8	
	Leased	7	5.8	
	Borrowed	20	16.7	
	Purchased	24	20.0	
Total		120	100	

Source: Field Survey, 2012

The respondents used either hired or family labour or both to carry out their farming activities but only a negligible percentage (11.7%) had access to credit (Table 2). This finding is similar to the finding of Akinagbe and Adonu (2014), where their study of credit sources and use by farmers in Nsukka local government area of Enugu state revealed that only 11 percent of the farmers had access to credit always. The farmers

were involved in crop production, processing and marketing. Farmers experience one form of risk or the other in carrying out these activities despite the avalanche of information channels at the farmers' disposal. Agriculture is an inherently risky business; some risks are everyday business risks; some risks are brought on by natural disasters (USDA, 2017)

Table 2: Farming activities of respondents (N = 120)

Farming activities	Frequency	Percentage (%)	
Labour used	Family	49	40.8
	Hired labour	18	15.0
	Both	53	44.2



Farming activities		Frequency	Percentage (%)
Access to credit facilities	Yes	14	11.7
	No	106	88.3
Source of capital	Personal saving	87	72.5
	Loan from commercial banks	2	1.7
	Cooperatives	14	11.7
Farming activities practiced	Esusu	17	14.2
	Producers	46	38.3
	Marketers	12	10.0
	Producers & Processors	12	10.0
	Producers & Marketers	30	25.0
Varieties of seedlings grown	All	20	16.7
	Local	60	50.0
	Improved varieties	4	3.3
Place of purchase of seedlings	Both	56	46.7
	ADP	1	0.8
	Personal farm	18	15.0
	Market	42	35.0
Source of Agric. Information	Personal farm & Market	59	49.2
	Publication	10	8.3
	Television	4	3.3
	Radio	4	3.3
	Extension agents	4	3.3
	Farmers association/group	15	12.5
	Friends/family	55	45.8
Contact with extension agents	Combined	28	23.3
	Monthly	4	3.3
	Fortnightly/two weeks	1	0.8
	Weekly	1	0.8
	Occasionally/sometimes	26	21.7
Visit outside community	No contact	88	73.3
	Monthly	15	12.5
	Fortnightly/two weeks	6	5.0
	Weekly/once	25	20.8
	Occasionally/sometimes	21	17.5
None at all	4	3.3	

Source: Field Survey, 2012

The study showed that out of the risk-causing factors ascertained among the farmers, it is the economic and financial factors that were found to be regular factors (Table 3), while environmental, production and institutional factors were occasional factors. In all, the risk causing

factors, as perceived by the farmers, were just occasional in nature (mean=1.96). The factors that are just occasional, might therefore not be having as much impact on the adoption behaviour of the farmers towards production technologies as those that were perceived as regular factors.

Table 3: Type of risk-causing factors faced by respondents

Type of risk-causing factors	R	O	R	N	Means	Grand Means	Remarks
	F (%)	F (%)	F (%)	F (%)			
1. Environmental							
Climate variability	22(18.3)	82(68.3)	12(10.0)	4(3.3)	2.02		
Poor soil type	57(47.5)	46(38.3)	8(6.7)	9(7.5)	2.56		
Soil degradation/vulnerability	14(11.7)	73(60.8)	15(12.5)	18(15.0)	1/69	1.63	Occasionally
Inadequate rainfall	0 (0)	14(11.7)	28(23.3)	78(65.0)	0.47		
Excess heat	4(3.3)	66(55.0)	29(24.2)	21(17.5)	1.44		

Type of risking-causing factors	R F (%)	O F (%)	R F (%)	N F (%)	Means	Grand Means	Remarks
2. Economic							
Cost of inputs	95(79.2)	19(15.8)	4(3.3)	2(1.7)	2.73	2.68	Regularly
Lack of infrastructure	75(62.5)	40(33.3)	2(1.7)	3(2.5)	2.56		
Poor access to technologies	95(79.2)	20(16.7)	4(3.3)	1(0.8)	2.74		
3. Production							
Lack of labour	28(23.3)	70(58.3)	10(8.3)	12(10.0)	1.95	2.16	Occasionally
Lack of storage facilities	83(69.2)	20(16.7)	12(10.0)	5(4.2)	2.51		
Pest/diseases	28(23.3)	72(60.0)	15(12.5)	5(4.2)	2.03		
4. Financial							
Lack of access to credit	98(81.7)	16(13.3)	3(2.5)	3(2.5)	2.74	2.66	Regularly
Lack of access to insurance services	99(82.5)	12(10.0)	5(5.0)	3(2.5)	2.74		
Lack of capital	67(55.8)	49(40.8)	1(0.8)	3(2.5)	2.50		
5. Institutional							
Government policies/Programmes	64(53.3)	31(25.8)	9(7.5)	16(13.3)	2.19	1.98	Occasionally
Lack of access to land	29(24.2)	35(29.2)	4(3.3)	52(43.3)	1.34		
Poor access to extension services	83(69.2)	26(21.7)	4(3.3)	7(5.8)	2.54		
Lack of access to information	41(34.2)	60(50.0)	9(7.5)	10(8.3)	2.10		
Lack of security	57(47.5)	59(49.2)	1(0.8)	3(2.5)	2.42		
Legislation/Laws	6(5.0)	56(46.7)	22(18.3)	36(30.0)	1.27		
6. Social and Cultural							
Traditional/Cultural beliefs	8(6.7)	60(50.0)	27(22.5)	25(30.0)	1.27	1.42	Rarely
Social status/Background	28(50.0)	48(23.3)	19(15.8)	25(20.8)	1.66		
Nom	2(1.7)	50(41.7)	33(27.5)	35(29.2)	1.16		
7. Personal							
Old age of the farmer	10(8.3)	41(34.2)	18(15.0)	51(42.5)	1.08	1.21	Rarely
Poor educational level	24(20.0)	37(30.8)	21(17.5)	38(31.7)	1.39		
Lack of knowledge/awareness	67(55.8)	14(11.7)	10(8.3)	29(24.2)	1.55		
Lack of experience	10(8.3)	41(34.2)	18(15.0)	51(42.5)	1.08		
Ignorance	10(8.3)	51(42.5)	24(20.0)	35(29.2)	1.03		
Lack of interest	8(6.6)	47(39.)	16(13.3)	49(40.8)	1.13		
Grand Mean						1.96	Occasionally

Source: Field Survey, 2012

Scale: regularly (R) = 3, Occasionally (O) = 2, Rarely (R) = 1, Never (N) = 0

Total Grand Mean: 1.96

Keys for Decision Scale: Regularly (2.6 – 3.0), Occasionally (1.6 – 2.5), Rarely (≤1.5)

Further findings from the study show that risk-causing factors, as perceived by the farmers, affect their adoption behaviour. Inaccessibility to credit and shortage of infrastructural facilities were the factors the farmers rated as the most impactful

on their adoption behaviour (4.5 and 4.4 respectively). More than 50% of the identified risk-causing factors were perceived by the farmers to have effect on their adoption behaviour as shown in Table 4.

Table 4: Respondents perception of the risk-causing factors affecting adoption behaviour towards production technologies

S/N	Perception statement	SA F (%)	A F (%)	U F (%)	D F (%)	SD F (%)	Mean
1.	I generally see risk in farming activities as normal event of life	58 (48.3)	39 (32.5)	5 (4.2)	17 (14.2)	1 (0.8)	4.1
2.	I prefer to manage risk in farming in my own native way rather than using modern measures against it.	19 (15.8)	40 (33.3)	14 (11.7)	42 (35.0)	5 (4.2)	3.2
3.	I believe that risk is associated with negative outcomes not within my control	12 (10.0)	46 (38.3)	16 (13.3)	38 (31.7)	8 (6.7)	3.1
4.	The inability to give up traditional/cultural beliefs is a problem	7 (5.8)	61 (50.8)	7 (5.8)	40 (33.5)	5 (4.2)	3.2
5.	I am not aware or I am ignorant of risk in farming	4 (3.3)	20 (16.7)	5 (4.2)	65 (54.2)	26 (21.7)	2.2



6.	The rural environment in which I live and operate does not facilitate effective communication and diffusion of agricultural information	52 (43.3)	46 (38.3)	14 (11.7)	2 (2.5)	5 (4.2)	4.1
7.	The production technologies which I see as taking risk is too expensive	27 (22.5)	68 (56.7)	17 (10.0)	12 (10.0)	1 (0.8)	3.9
8.	The production technologies which I see as taking risk requires excessive labour during application	16 (13.3)	38 (31.7)	17 (14.2)	44 (36.7)	5 (4.2)	3.1
9.	The programmes/policies of Government aimed at expanding farmers production and Agricultural development as failed	58 (48.3)	43 (35.9)	12 (10.0)	6 (5.0)	1 (0.8)	4.2
10.	The new production technologies are compatible with the existing practices/processes on my farm.	11 (9.2)	51 (42.5)	17 (14.2)	34 (28.3)	7 (5.8)	3.2
11.	Most farmers are illiterate who lack adequate knowledge of modern farming techniques.	45 (37.5)	46 (38.3)	4 (3.3)	20 (16.7)	5 (4.2)	3.8
12.	The unavailability of capital or access to credit for me to practice modern production.	72 (60.0)	43 (36.0)	3 (2.5)	0 (0.0)	2 (1.5)	4.5
13.	The acute shortage of infrastructural facilities (poor road, lack of market and transportation, electricity etc) is a problem	69 (57.5)	40 (33.3)	6 (5.0)	5 (4.2)	0 (0.0)	4.4
14.	The benefit of taking risk, that is applying modern production technologies is in the future	24 (20.0)	40 (33.3)	10 (8.3)	28 (23.3)	18 (15.0)	3.1
15.	The lack of, or access to the technology is a major problem	40 (33.3)	66 (55.0)	7 (5.8)	3 (2.5)	4 (3.3)	4.1

Source: Field survey

Scale: Strongly agree (SA) = 5, Agree (A) = 4, Undecided (U) = 3, Disagree (d) = 2, strongly disagree (SD) = 1
 Keys for decision: where, $\leq 1.5 = SD$, $1.6 - 2.4 = D$, $2.5 - 3.4 = U$, $3.5 - 4.4 = A$ and $\geq 4.4 = SA$.

Table 5 shows the respondents' adoption category of crop production technologies. It was found that generally, 50% of the respondents were high adopters (≥ 1.59), while the same percentage was for low adopters (< 1.59). This finding

indicates that the risk-causing factors have high effect on the respondents' adoption behaviour towards the production technologies in the study area.

Table 5: Respondents distribution on adoption of production technologies (N = 120)

Innovation/Production Technologies	R F (%)	O F (%)	R F (%)	N F (%)	Means	Remark
Improved land preparation/Tillage practices	63(52.5)	52(43.3)	3(2.5)	2(1.7)	2.47	HA
Use of improved crop varieties	35(29.2)	30(25.0)	9(7.5)	46(38.3)	1.45	LA
Planting of early season crops	87(72.5)	30(25.0)	3(2.5)	0(0)	2.70	HA
Planting of indigenous varieties	85(70.8)	25(20.8)	9(7.5)	1(0.8)	2.62	HA
Appropriate planting time/date	80(66.7)	35(29.2)	3(2.5)	2(1.7)	2.62	HA
Appropriate row spacing	76(63.3)	30(27.5)	9(7.5)	2(1.7)	2.53	HA
Use of herbicides	33(27.5)	39(32.5)	8(6.7)	40(33.3)	1.54	LA
Use of insecticides (chemical) to control pest in crop production	16(13.3)	30(25.0)	13(10.8)	61(50.8)	1.01	LA
Use of biological method to control pest in crop production	2(1.7)	10(8.3)	11(9.2)	97(80.0)	0.31	LA
Use of mechanical method to control pest in crop production	37(30.8)	55(45.8)	12(10.0)	16(13.3)	1.94	HA
Use of organic fertiliser/manure	17(14.2)	65(54.2)	8(6.7)	30(25.0)	1.57	HA
Use of inorganic fertiliser	8(6.7)	31(25.8)	12(10.0)	69(57.5)	0.82	LA

Innovation/Production Technologies	R F (%)	O F (%)	R F (%)	N F (%)	Means	Remark
Use of improved method of fertiliser application	16(13.3)	26(21.7)	10(8.3)	68(56.7)	0.92	LA
Use of modern farm implement	7(5.8)	30(25.0)	16(13.3)	67(55.8)	0.81	LA
Crop rotation practice	55(45.8)	54(45.0)	7(5.8)	4(3.3)	2.33	HA
Mulching of crops	43(35.8)	64(53.3)	7(5.8)	6(5.0)	2.20	HA
Use of modern processing facilities	56(46.7)	53(44.2)	7(5.8)	4(3.3)	2.34	HA
Use of improved storage facilities	4(3.3)	16(13.3)	17(14.2)	83(69.2)	0.51	LA
Use of modern harvesting equipment	3(2.5)	9(7.5)	16(13.3)	92(76.7)	0.37	LA
Use of modern packaging techniques	8(6.6)	23(19.2)	16(13.3)	73(60.8)	0.74	LA
Grand Mean					1.59	HA

Source: Field survey, 2012

Key for Decision Scale: Regularly (R) = 3, Occasionally (O) =2, Rarely (R) = 1, Never (N) = 0

Grand mean: 1.59

High adoption (HA) = ≥ 1.59 , Low adoption (LA) = <1.59

The respondents were found to be high adopters of technologies that did not involve much capital outlay, while they were low adopters in technologies with high capital outlay. This may be due to the risk-causing factors as shown in Table 6. The finding indicates that risk-causing factors have high effect on the respondents' adoption behaviour

towards the production technologies. This corroborates Ukpong (1993) who found that, the number of programmes or policies introduced by Nigeria Government to increase agricultural activities has been minimal as a result of farmers' inadequate equipment against risks and uncertainties.

Table 6: The effect of the risk-causing factors on the respondents adoption behaviour towards the production technologies (N = 120)

Type of risking-causing factors	High Effect F(%)	Moderate Effect F(%)	Low effect F(%)	No effect F(%)	Means
1. Environmental					
Climate variability	77(64.2)	26(21.7)	9(7.5)	8(6.6)	2.43
Poor soil type	80(66.7)	38(20.8)	11(9.2)	4(3.3)	2.51
Soil degradation/vulnerability	47(39.2)	47(39.2)	16(13.3)	10(8.3)	2.09
Inadequate rainfall	21(17.5)	9(7.5)	16(13.3)	74(61.7)	0.8
Excess heat	18(15.0)	40(33.3)	31(25.8)	31(25.8)	1.38
2. Economic					
Cost of inputs	97(80.0)	15(12.5)	5(4.2)	3(2.5)	2.72
Lack of infrastructure	98(81.7)	15(12.5)	5(4.2)	2(1.7)	2.74
Poor access to technologies	105(87.5)	14(11.7)	1(0.8)	0(0)	2.87
3. Production					
Lack of labour	80(66.7)	25(20.8)	11(9.2)	4(3.3)	2.51
Lack of storage facilities	94(78.3)	19(15.8)	7(5.8)	0(0)	2.73
Pest/diseases	56(46.7)	37(30.8)	25(20.8)	2(1.7)	2.23
4. Financial					
Lack of access to credit	94(78.3)	22(18.3)	2(1.7)	2(1.7)	2.73
Lack of access to insurance services	76(63.3)	29(24.2)	8(6.7)	7(5.8)	2.45
Lack of capital	104(86.7)	15(12.5)	1(0.8)	0(0)	2.86
5. Institutional					
Government policies/Programmes	22(18.3)	23(19.2)	23(19.2)	52(43.3)	1.23
Lack of access to land	65(54.2)	31(25.8)	5(4.2)	19(15.8)	2.18
Poor access to extension services	77(64.2)	34(28.3)	6(5.0)	3(2.5)	2.54
Lack of access to information	62(51.7)	45(37.5)	11(9.2)	2(1.7)	2.39
Lack of security	72(60.0)	35(29.2)	10(8.3)	3(2.5)	2.45
Legislation/Laws	15(12.5)	14(11.7)	50(41.7)	41(34.2)	1.03
6. Social and cultural					
Traditional/Cultural beliefs	7(5.8)	17(14.2)	52(43.3)	44(36.7)	0.89
Social status/Background	47(39.2)	27(17.5)	32(26.7)	14(11.7)	1.89
Nom	6(5.0)	21(17.5)	52(43.3)	41(34.2)	0.93



Type of risk-causing factors	High Effect F(%)	Moderate Effect F(%)	Low effect F(%)	No effect F(%)	Means
7. Personal					
Old age of the farmer	28(23.3)	27(22.5)	18(15.0)	47(39.2)	1.30
Poor educational level	51(42.5)	20(16.7)	10(8.3)	39(32.5)	1.69
Lack of knowledge/awareness	77(64.2)	27(22.5)	7(5.8)	9(7.5)	2.43
Lack of experience	70(58.3)	27(22.5)	9(7.5)	20(16.7)	2.13
Ignorance	70(58.3)	26(21.7)	13(10.8)	11(9.2)	2.29
Lack of interest	52(43.3)	39(32.5)	10(8.3)	19(15.8)	2.03
Total Grand Mean					2.08

Source: Field Survey, 2012

Scale: regularly (R) = 3, Occasionally (O) = 2, Rarely (R) = 1, Never (N) = 0

Grand Mean : 2.08

Keys for Decision Scale: Low effect < 2.08), High effect (≥ 2.08)

Findings on the correlation between effects of risk-causing factors and adoption behaviour of the respondents (Table 7) show that personal risk-causing factors have high correlation with respondents' adoption behaviour. So also, financial risk-causing factors have a negative but significant relationship with the respondents'

adoption behaviour towards the production technologies, implying that, increase in financial risk-causing factors result in decrease in the respondents' adoption behaviour towards the production technologies. This could engender the respondents' refusal to adopt technologies that are high in capital outlay and are sophisticated.

Table 7: Correlation matrix showing the relationship between the effects of the risk-causing factors on the respondents' adoption behaviour towards the production technologies

	Adoptio n score	Environ.	Econ.	Prdn.	Finan.	Institu.	Sociocul	Person.
Adoption Score	1							
Environmental	0.033	1						
Economic	-0.021	0.138	1					
Production	-0.022	0.244**	0.367**	1				
Financial	-0.250**	0.069	0.428**	0.228*	1			
Institutional	0.153	0.029	0.125	0.190*	0.176	1		
Social & Cultural	-0.096	0.114	-0.031	0.132	0.132	0.273**	1	
Personal	0.526**	0.146	0.077	-0.076	0.058	0.082	0.001	1

Source: Field Survey, 2012

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

CONCLUSION AND RECOMMENDATIONS

The study has established that access to income, credit facilities, extension services and some other socio economic variables are important risk-causing factors affecting the adoption behaviour towards production technologies. Where there are financial risk-causing factors, farmers become hesitant in adopting sophisticated technologies, which might be of more effective use. Risk-causing factors are found to be having more effect among farmers with low level of education, low capital and those with less access to credit. It was therefore, recommended that in reducing risk-causing factors, farmers must be guaranteed access to credit, exposed to adult literacy and extension information.

REFERENCES

- Akinagbe O. M and Adonu A.U(2014) Rural Farmers Sources and Use of Credit in Nsukka Local Government Area of Enugu State, Nigeria. *Asian Journal of Agricultural Research*, 8: 195-203.
DOI: 10.3923/ajar.2014.195.20
- Mosley, P and Verschoor, A (2003): Risk Attitudes in the Vicious Cycle of Poverty. University Of Sheffield. Pp 2-26 (Unpublished)
- Okuneye, P.A. (2000): Rising cost of Prices and food Security in Nigeria and its implications for poverty reduction. CBN *Economic Financial Review*, 39(4)p



Ukpong, G.E. (1993): Some Strategies for the Development of Nigeria's Agricultural sector in the 1990s. *Economic Financial Review*. CBN 31 (2): 86-90

USDA(2017): available at <https://newfarmers.usda.gov/risk-management>. Accessed June 2018