

Effects of Flooding on Rice Farmers Poverty Status in Niger State, Nigeria

Augustine Apuyor^{*}, Benson Obukowho Apuyor^{**}, Shema Andrew Monday^{***},
Daniel Matthew^{****}, Kingsley Efe Apuyor^{*****}, Stanley Ejohwomu Apuyor^{*****},
Moses Ogar Okachi^{*****}, Baba Usman^{*****}

ARTICLE INFO	ABSTRACT
<i>Article history:</i> Received: July 5, 2025 Accepted: September 10, 2025 Published: September 29, 2025 <i>Keywords:</i> Disasters, Flooding, Incidents, Multistage, Poverty status	The study analyzed effect of flooding on rice farmers' Poverty status in Niger State. A multi-stage sampling technique was used to select 234 respondents for the study. Data collected were analyzed using descriptive and inferential statistics. From the results showed that poverty incidence (Po) among the rice farmers in the study area was 0. 51 representing 51% of the rice farmers were with income level below the poverty line of N339, 531.05. The poverty status of rice farmers is significantly affected by age of the household head, farm size, number of extensions visit, educational status, rice farming experience, have you ever experienced flood, crop lost due to flood incidents, loss of livestock due to flood incidents, and loss of family member due to flood incidents. The study concluded that flood had adversely affected farmers' poverty status in the study area.

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1. Introduction

Flooding has emerged as one of the most serious environmental problems of the 21st century in Nigeria, severely affecting the rice industry and exacerbating the vulnerability of farming households. Understanding its impact on poverty status is therefore crucial for designing effective policies and resilience strategies for rice farmers in the country.

2. Literature review

In recent years, Nigeria has been threatened with regular and extreme flooding reoccurrence which has led to enormous destruction of crops, livestock, houses and human lives. It was reported that over \$16.9 billion was lost due to incidence of flood in 2012 alone which compounded the poverty status of the farmers and the entire population (Oladokun and Proverbs, 2016). More so, in 2020, there was devastating flood in about 20 Local Government Areas of Niger State which mostly affected rice farm that led to significant decrease in the actual capacity of its production. The 2020 flood incidence in Niger State affected about 17, 000 communities and about 60,000 homes were pulled down as well as farmlands (Environ, 2020).

^{*}, ^{**}, ^{***}, ^{****}, ^{*****}, ^{*****}, ^{*****}, ^{*****} Department of Research Outreach, National Cereals Research Institute Badeggi, P M B 8 Niger State, Nigeria, ^{*****} Department of Industrial Chemistry Dennis Osadebay University Asaba, Delta State Nigeria. Email addresses: apuyoraugustine1@yahoo.com (Corresponding author – A. Apuyor), fitzapuyor@yahoo.com (B. O. Apuyor), shemaadrew82@gmail.com (S. A. Monday), danielmathew90@yahoo.com (D. Mathew), kingsley.apuyor@dou.edu.ng (K. E. Apuyor), stanley.apuyor@dou.edu.ng (S. E. Apuyor), okachimoses4life@gmail.com (M. O. Okachi), usmantoroko@gmail.com (B. Usman).

Rice plays a vital role in ensuring sustainable food security as well as provision of employment and income to the nation's teeming population. Nigeria has been a major consumer and importer of rice in Africa. Indeed, rice is classified among the top four agriculture imports in Nigeria along with wheat, sugar and fish (Terwase and Madu, 2014). It has been reported that the country spends over ₦356 billion on yearly importation of rice, out of which about ₦1 billion is used per day (Oyediran, 2020). Rice production in Nigeria is mainly rain-fed and most of the activities are carried out along the water plain which increases their vulnerability to flooding. (Tiamiyu et al., 2015). The devastating nature of flood has made some farmers looked for alternative sources of livelihood which could reduce agricultural productivity in the country (Magami et al., 2014). According to Ikani (2016), flooding leads to enormous socio- economic and environmental damages to human lives, farm lands, buildings, and structures which inflicts extreme suffering on the communities affected. Furthermore, it hinders food production leading to food shortage in the affected villages or towns. Flood also causes serious adverse effects on the standard of living and overall development prospects of a nation (Ikani 2016). In view of the above highlights, this study attempts to assess the effects of flooding on rice farmers' poverty status in Niger State. Akukwe et al. (2020), revealed the effects of flood on food security. However, they considered the before and after effects on households' food security status in South-Eastern Nigeria. In their finding, it was affirmed that flooding induced hunger as a result of devastations on farmlands and properties. Osasogie and Alabi (2015), in their study on "Economic analysis of effect of flood on income distribution among farmers in Edo State, Nigeria" reported the effects of flooding on farmers income in Edo State that farmers lost all most all their income to flood incidence. Ajibade et al. (2019) study on the empirical analysis of adaptation strategies used in mitigating flood related losses by rice farmers in Kwara State, Nigeria and asserted that educational level, previous years losses due to flooding incidents and farmers savings makes the farmers in their study area to easily adapt the mitigating strategies. Udemezue et al. (2020) affirmed in their study on effects of flooding on small scale farmers in Anambra, Nigeria that farmers lost their crop farms properties, family members to flood and left many of the farmers homeless.

3. Methodology

The Study Area

The study was carried out in Niger State of Nigeria. Niger State is located between Latitude 8°22'N and 11°30'N and Longitude 3°30'E and 7°20'E and covers a land area of about 76,363sq km, or about 8% of Nigeria's total land area ((Ishaku, 2014). A Multistage sampling technique was used for the selection of respondents for this study. The first stage was purposive selection of two LGAs each from the agricultural zones I, II and II1 which are namely: Lavun and Gbako, Paikoro and Bosso, and Wushishi and Mashegu respectively. The second stage also involved purposive selection of two rice producing villages that are mostly affected by flood and two rice producing villages that are less or not affected by flood from each of the selected LGAs. This gives a total of 24 villages selected for the study. The third stage employed Taro Yamane's formula as adopted by Ibeziako(2017) to obtain an appropriate sample from the sample frame.

A total of 234 respondents was selected from a total sample frame of 933(mostly affected = 467and less affected = 466) registered rice farmers. This comprising of 117 households who were mostly

affected by flood and 117 households who were less or not affected by flood at 0.08% or 92% precision and confidence level respectively.

The Foster-Greer-Thorbecke (FGT) poverty index was used to determine the poverty status of rice farmers, while the Logistic Regression model was applied to analyze the effects of flooding on the poverty status of rice farmers in the study area. The model was specified as follows (Formula 1):

$$L_i = \ln(P_i / (1 - P_i)) = \beta_0 + \beta_1 * X_1 + \beta_2 * X_2 + \dots + \beta_{19} * X_{19} \dots \dots \dots (1)$$

4. Results and discussions

Table 1, shows that poverty incidence (Po) among the rice farmers in the study area was 0. 51 representing 51% of the rice farmers are with income level below the poverty line of N339, 531.05.

Table 1. Analysis of poverty status of rice farmers

Poverty Indices	FGT Value
Poverty Incidences (P0)	0.51
Poverty Gap (P1)	0.22
Poverty Severity (P2)	0.14
Mean Per capital income per year ₦ 509,296.58	
Mean Per capital income per month ₦ 42,441.38	
Poverty line ₦ 339,531.05	

Source: Field Survey, 2021

The result also reveals that poverty depth (P1) or poverty gap was 0.22 representing 22%. This implied that 22% of the poverty line that is N74, 696.83 was required to bring an average poor rice farmer in the study area to the poverty line. This is the minimum cost of eradicating poverty in the study area. While the severity of the poverty index was 0.14 representing 14% of the poorest rice farmers among the poor in the study area. This implied that they required assistance from Governments and stakeholders as the incidence of flooding has adversely affected their livelihood status leaving them in severe poverty. This result is in line with the studies of Udemezue et al (2019) who research on the “Effects of flooding on small scale farmers in Anambra, Nigeria” and reported that there were starvation and hunger with severe poverty due to flood incidents.

Effects of flooding on the poverty status of rice farmers in Niger State

Table 2: shows that poverty status of rice farmers is significantly affected by age of the household head, farm size, number of extensions visit, educational status, rice farming experience, have you ever experienced flood, crop lost due to flood incidents, loss of livestock due to flood incidents, and loss of family member due to flood incidents. The positive coefficient means that increasing the explanatory variables by one unit will increase the poverty level by the value of the coefficient while negative coefficient means that increasing the explanatory variable by one unit will reduce the poverty level by the value of the coefficient.

Table 2. Logit result of the Analysis of the effects of flooding on rice farmers poverty status

Variables	Coefficient	Standard error	Z value
Age of Respondent	-0.0851554	0.04427	-1.92*
Gender	0.5371112	0.692049	0.78
Household size	-0.0007327	0.0800057	-0.01
Farm Size	-0.4823561	0.2863575	-1.68*
Number of extensions Visit	-3.03712	0.5186902	-5.86***
Educational Status	0.3571742	0.2061528	1.73*
Rice farming Experience	0.1611728	0.0587767	2.74***
Annual Farm income	3.03e-07	5.82e-07	0.52
Off farm income	-1.35e-06	1.08e-06	-1.25
Did you experience flood	2.876468	0.7313526	3.93***
Amount of Crop lost due to flooding	-6.27e-06	2.32e-06	-2.70***
Farmland loss due to flooding	1.485298	0.6631354	2.24**
Number of livestock lost due to flooding	-0.0000258	0.0000126	-2.05**
Loss of Building due to flooding	1.42e-06	1.27e-06	1.12
Contraction of disease due to flooding	-0.3471692	0.7242244	-0.48
Availability of fish due to flooding	-0.546959	0.7170795	-0.76
Availability of fertile soil due to incidence of flooding	0.2694513	0.7165918	0.38
Loss of family member due to flood	-0.0001853	0.0000645	-2.87***
Constant	0.6066121	1.618708	0.37
Pseudo R2	0.6748		
Prob> chi 2	0.0000		
Log likelihood	-52.289888		

Source: Field Survey, 2021

* 10% level of significant, ** 5% level of significant and***1% level significant

The coefficients of extension visits, loss of family member due to flooding, crop loss due to flooding, loss of livestock, age of household head and farm size were negative but significant at 1%,1%,1%,5%,10% and 10% probability levels respectively and the implied that the more extension agents visits, the more the number of families, crops and livestock lost to flooding, the older the household head and the larger the farm size the more the likelihood of reduction in the poverty level of the farmers negatively. Extension agents' regular visits to the farmers will aid the diffusion of information which makes farmers to be well informed and persuaded to adopt new technologies required for their farming operations. Also, acquisition of more plots of farmland indifferent areas will reduce the impact of flooding experience on the livelihood of farmers which could reduce their poverty level. This is likely to be because, such a farmer had enough experience to carry out farming activities perfectly. This result agrees with the study of Ajewole et al. (2016) on "Gender analysis of poverty among rice farming household in Nigeria" and reported that experience is a function of age which can make the farmers perfect in the use of the available technologies at their disposal. It is also in line with the finding of

Osanyinlui and Adenegan (2016), who asserted that farm size is positively related to productivity in Ekiti State. Further, experience of flooding incidence, loss of farmland, year of farming experience, educational level was all positive and significant at 1%, 5%, 1%, and 10% probability levels respectively. This implied that increase in flooding incidence, loss of farmland, years of experience and educational attainment increased the likelihood of increasing the poverty level of the rice farmers in the study area.

This agrees with the study of Osasogie and Alabi (2015) who reported that farmers in Edo lost 79% of their income due to flood incidence.

The effects of years of experience and educational attainment on poverty levels of farmers were however contrary to the a priori expectation. The findings in line with the report of Nkwunonwo et al. (2015).

5. Conclusions

Based on this study, it can be concluded that flooding has been major cause of poverty to rice farmers in the study area. Therefore, government should intervene by helping the rice farmers with irrigation facilities to increase their productivity and incomes to alleviate their poverty.

Acknowledgements

The lead author declared that this research did not receive any financial support from any source. The author also declared that there was no conflict of interest during the research development.

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