

ESTIMATING LIVESTOCK LOSSES IN A FLOOD DISASTER: A CASE OF NIGERIA

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ABSTRACT

Livestock are extremely important to economic development and welfare in most low and middle income countries, since they are basically considered as stores of wealth, generators of income and sources of nutrition, hence, losing livestock as a result of any disaster can lead to a decrease in agricultural output, owners income and reduced nutritional intake. This paper therefore, aimed estimating the extent of livestock losses due flood disaster in Nigeria, as reported by UNDP, WFP and FAO joint assessment report on 2012 flood, using multiple regression analysis. Findings of the study, revealed that livestock losses incurred by farming household were significant at 5% level of probability for all the reported livestock. This study recommends to policy makers in facilitating cost-effective integrated flood management to avoid future livestock losses.

Keywords: flood disaster, livestock, losses

INTRODUCTION

Floods are the most common and serious natural disasters occurring in most part of the world, and it stands out to be the most widespread and disastrous among all natural hazards of the world (Geraldine, Nwokoye, Uwajumogu, & Ezenekwe, 2014). As shown in Figure 1 below, it is more devastating on agriculture as it inflicts physical damage to Crops, livestock, infrastructure and equipment; reduced plant growth, lower harvest yields, reduced crop quality, loss of grazing and fodder for livestock (Morris, 2019).

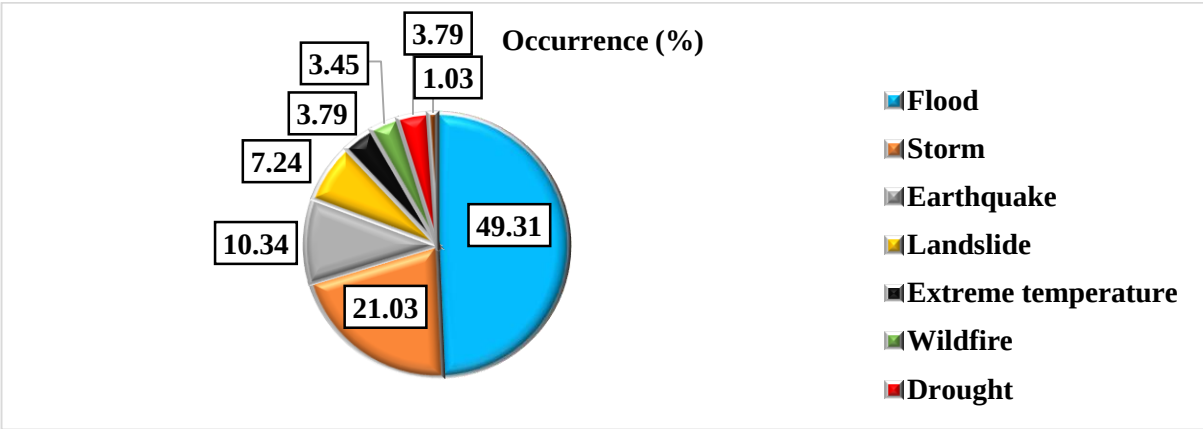


Figure 1. Frequency of major natural disasters worldwide
Source: Global natural disaster assessment report (GNDAP) 2019

Flood is considered to be one of the greatest weather-related natural disaster causing serious economic effect in terms of damage/losses of crops, livestock and infrastructures, displacement of people and widespread of diseases.(Bremond, 2013; Silva and Kawasaki, 2020).

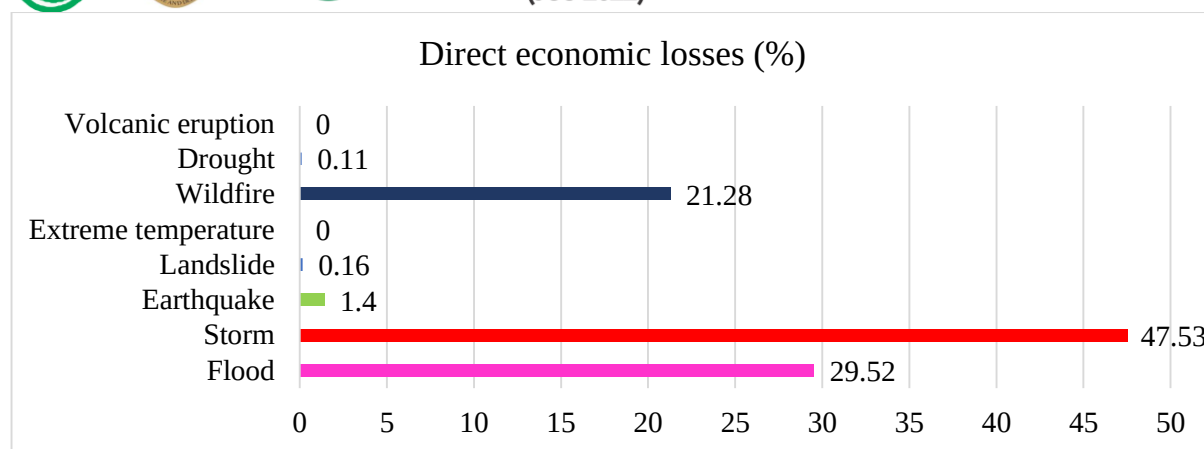


Figure 2. Direct economic losses of major natural disasters worldwide, 2019
Source: Global natural disaster assessment report (GNDAP) 2019

As also indicated in the figure 3 below Nigeria had experienced livestock production losses (amounting to N380 billion) (PDNA, 2013).

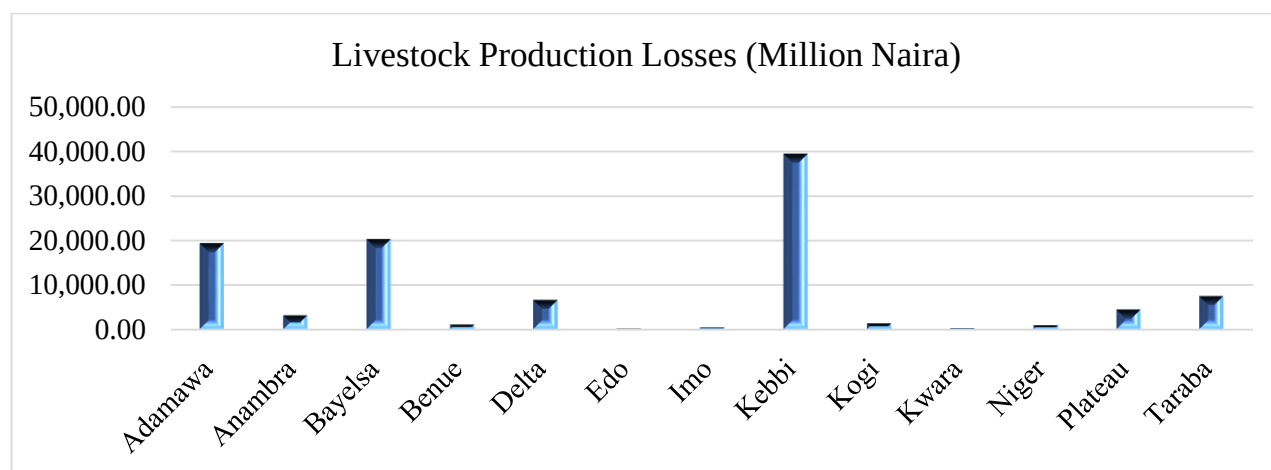


Figure 3. Estimated Value of Losses in the Livestock Subsector
Source: Post-Disaster Needs Assessment 2012 Floods (FMARD) Nigeria

The problem of losing livestock in a disaster would have negative effects on the livelihood outcomes of their owners, especially in rural communities, where a majority of households still depend on smallholder livestock production for survival (Geraldine et al., 2014; PDNA, 2013). Since livestock are extremely important to economic development and welfare in most low income countries, as they represent more than food but represent livelihoods in terms of providing meat, milk and eggs; they assist with ploughing fields and can be sold for cash (Campbell, R., Knowles, 2011). Hence, this research intends to estimate the extent of livestock losses as a result of flood disaster in Nigeria.

MATERIALS AND METHODS

This section adopted the documentary method of data collection, which involves gathering of data from the secondary sources through reports, journal articles, newspapers, books, other publications, among others. This research therefore adopted the data (in Table 1 below) reported by UNDP, WFP and FAO joint assessment report on 2012 flood, using multiple regression analysis.



Table 1. Estimated Losses in the Livestock Sub-sector

States	Cattle (₦ Millions)	Small Ruminants (₦ Millions)	Poultry (₦ Millions)	Pigs (₦ Millions)	No. of Households affected
Adamawa	20,368	45,828	45,828	0	5,092
Anambra	0	33,967	65,103	36,797	5,897
Bayelsa	0	343,703	2,749,626	412,444	50,919
Benue	939	12,204	12,207	7,510	4,267
Delta	0	301,950	301,950	0	60,390
Edo	0	52,360	52,360	0	20,944
Imo	0	125,616	96,628	169,099	3,451
Jigawa	0	0	0	0	0
Kebbi	43,115	137,967	129,344	0	12,870
Kogi	1,834	22,012	23,847	0	4,266
Kwara	1,102	14,882	8,268	0	2,901
Niger	3,263	12,021	126,769	4,410	14,854
Plateau	1,854	4,946	11,129	1,237	1,508
Taraba	64,497	145,117	145,117	0	21,216
TOTAL	136,972	1,252,573	3,768,176	631,497	208,575

Source: Joint assessment report by UNDP, WFP and FAO (2012). Adopted from (Geraldine et al., 2014)

The implicit model is specified as:

$$Y = B_0 + B_i X_i + \varepsilon_i$$

Where Y is the number of households affected, Xi is a vector of cattle, small ruminants, poultry and pig losses measured in millions of Naira. Bi is the coefficient of the estimated variables and Ei is the error term

While the explicit model is specified as:

$$Y_{household\ affected} = \beta_0 + \beta_1 X_{cattle\ loss} + \beta_2 X_{small\ ruminant\ loss} + \beta_3 X_{poultry\ loss} + \beta_4 X_{pig\ loss} + e_i$$

RESULTS AND DISCUSSION

Table 2: Regression Analysis Results

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Regression Statistics				
Multiple R	0.972839313		<i>F</i>	<i>Significance F</i>
R Square	0.946416329		39.74040409	0.00001003
Adjusted R Square	0.922601364			
	Coefficients	Standard Error	<i>t Stat</i>	<i>P-value</i>
Intercept	3578.77	1952.26	1.833	0.099
Cattle loss	0.230	0.080	2.853	0.018**
Small ruminant loss	0.171	0.020	8.466	0.000*
Poultry loss	0.017	0.005	3.081	0.013*
Pig loss	0.142	0.032	4.370	0.001*

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Note * = 1%. ** = 5% level of significance

The regression analysis result in Table 2 above, revealed that, F-statistics = 39.740 and P-value = 0.000 indicates that the combined effect of all the variables in the model is different from zero, and the model as a whole is reliable and statistically significant, R^2 is 0.97 shows that 97% of the dependent variable is explained by the independent variables and the regression model is fit. However, all the independent variables were found to be significant, indicating that losses in these livestock as a result of flood disaster significantly affect the affected households, this result is in conformity with the findings of Campbell, R. and Knowles (2011) who reported that household lost livestock worth US\$2,065 as over 1.2 million ruminants and 6 million poultry as a result of flooding.

CONCLUSION AND RECOMMENDATION

Based on the study findings, the results showed that livestock losses incurred by farming household were significant at 5% level of significance for all the reported livestock and in turn will decrease agricultural output, owners income and reduced nutritional intake in the country. The research findings might also be important for policy makers in facilitating cost-effective integrated flood management to avoid future losses and put more effort in sensitizing the stock owners on the dangers of flooding and flood management to mitigate the risks of losing livestock during and after a major flood event.

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