



ENVIRONMENTAL SHOCKS AND AGRICULTURAL REVENUE: SECONDARY DATA ANALYSIS OF 2018/19 NIGERIAN GENERAL HOUSEHOLD SURVEY

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ABSTRACT

The study was designed to investigate the link between environmental shocks and agricultural revenue using secondary data obtained from the 2018/2019 Nigerian general household survey. Variables were subjected to correlational analysis using Spearman correlation coefficient. Results indicate that 0.8% and 6.6% of Nigerian households experienced harvest destruction by fire and flooding respectively. The average amount of money accrued from the sale of unprocessed and processed crops in Nigeria were ₦112,774 and ₦44,593 respectively. Destruction of harvest by fire is negatively but insignificantly related to mean total sales of unprocessed crops ($r = -.268, p > 0.05$) while it is negatively, strongly and significantly related to mean total sales of processed crops ($r = -.996, p < 0.05$). Flooding that caused harvest failure is negatively but insignificantly related to mean total sales of unprocessed crops ($r = -.217, p > 0.05$) and processed crops ($r = -.300, p > 0.05$). Destruction of harvest by fire is the single most vital determinant of reduced earnings from sales of processed crops. Empirical credence afforded the idea that environmental shocks and agricultural revenue are conflicting social realities in Nigeria.

Keywords: Environmental shocks, agricultural revenue, fire outbreaks, flooding.

INTRODUCTION

Environmental issues bear consequences on virtually all aspect of human life. Because the human abode is the physical environment, environmental dynamics reverberate through and exert tremendous effect on mans' outcomes. Global discourses are replete with environmental concerns and arguments. The utilization and misuse of natural resources attracts tremendous attention. Hence, in the much referenced Brundtland Report of the World Commission on Environment and Development, sustainable development was well-defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987: 43). Concerns about over-consumption of, and conservation of natural resources is just a justification for environmentalism. An increasing debate center around the consequences of

environmental misuse and abuse for total human well-being devoid of disasters. Steiner (2008) asserted that "disasters not only reveal underlying social, economic, political and environmental problems, but unfortunately contribute to worsening them. Such events pose serious challenges to development, as they erode hard-earned gains in terms of political, social and educational progress, as well as infrastructure and technological development" (emphasis ours).

Upholding sustainable environment is non-negotiable in the light of calamitous consequences that typically results from environmental neglect and abuse. Desertification, climate change, deforestation, flooding, global warming, forest fire, air/water pollution are consequences of unsustainable attitudes and behaviours which can equally be abated through sustainable actions.

Global data indicates that over 650,000 individuals lost their lives from 1999 to 2009 on account of severe weather conditions (Harmeling, 2010). When environmental disasters occur, people experience shocks. Incidentally, disasters and shocks are disproportionately encountered. Vulnerability to experiencing negative consequence of environmental change is higher among poor people of the developing world (World Bank & United Nations, 2010; Khan *et al.*, 2019). Developing and poorer societies records greater number of deaths from environmental disasters (Kahn, 2005) and this reduces the possibility of alleviating poverty and facilitating economic development (Skoufias, 2003; Sawada, 2007). Physical, mental and social well-being is dependent on the environment (EEA, 2010). Healthy environment is a prerequisite for human health and national development (Alumona and Onwuanabile, 2019). Harmeling (2010) reported that globally, over \$2.1 trillion losses were recorded between 1999 and 2009. The losses recorded in the Nigeria's 2012 flood disaster were approximated to be ₦2.6 trillion— US\$16.9 billion (FGN, 2013). Indeed, socio-economic life suffers from harmful environment.

Incidentally, agriculture is worst hit by environmental challenges. Farmers and agricultural production are most vulnerable to environmental hazards, which degrades farmer-income (Cervantes-Godoy *et al.*, 2013). This happens even as agriculture has transformed globally, owing to the use modernised agricultural technologies which have expanded productivity and availability of food (Jibir *et al.*, 2016). Nevertheless, African agriculture is poorly-advanced technology-wise and there is widespread poverty, making agriculture to be more open to environmental hazards in this context (Mulwa *et al.*, 2017; Adimassu *et al.*, 2014). In the developing world, approximately 1.5 billion people live in extreme poverty. Of these, roughly 75% are residents of rural communities in several sub-Saharan African (SSA) countries where agriculture is the typical route to survival (Osabohien *et al.*, 2018). At the same time, in developing countries, formal insurance schemes protecting against environmental disasters are usually lacking or very limited (Sawada and Takasaki, 2017). This is in part due to African governments' and peoples' preoccupation with matters of hunger and insecurity, and the consequent predisposition to

assume that environmental issues are only within the purview of western countries. Still, the consequence of environmental shocks on agricultural production, output and revenue of economically challenged contexts like sub-Saharan Africa including Nigeria is often acknowledged with poor empiricism. Using macro data to showcase evidence on the nexus between environmental shocks and agricultural revenue is therefore, truly valuable. This article is the report of an examination of the relationships between indices of environmental shocks (fire outbreaks and flooding) and agricultural revenue (sales from farm produce) using data of the 2018/19 Nigerian General Household Survey. The major objective of the study was to examine the effect of destruction of harvest by fire and flooding that caused harvest failure on the average amount of money recouped from the sale of unprocessed and processed crops.

MATERIALS AND METHODS

In this study, secondary data were analyzed. Information gathered from the 2018/19 Nigeria General Household Survey (the 2018/19 GHS) were utilized (NBS, 2019). The survey which was conducted nationwide was aimed at providing standard information regarding Nigerian household characteristics as well as agricultural information. The study utilized information from secondary data obtained from the survey conducted by the National Bureau of Statistics, the Federal Ministry of Agriculture and Rural Development, the National Food Reserve Agency, in conjunction with the Bill and Melinda Gates Foundation and the World Bank. The 2018/19 GHS was conducted on a sample population of 4,976 respondents selected from households spread across the six geo-political zones that makes up the Nigerian state. Spearman rank correlation coefficient was used to examine the nature of the relationships between pairs of variables, using Statistical Package for the Social Sciences (SPSS) version 23.0.

RESULTS

Information contained on table 1 indicates that 0.8% of Nigerian households experienced destruction of harvest by fire. Invariably, harvests of 8 of 1000 households were destroyed by fire. Destruction of harvest by fire was recorded in 9 of 1,000 households in rural Nigeria (0.9%) but this proportion reduced to 5 of 1,000 (0.5%) households

in urban Nigeria. Across Nigerian's geo-political regions, the incidence of fire disasters affecting farm harvests was highest in the south-east, where 20 of 1,000 (2.0%) households experienced same. It was also at par in the north-central and the south-south regions, where 11 of 1,000 (1.1%) households recorded destruction of harvest by fire. The proportion of households recording destruction of harvest by fire is lower across the north-west (3 of 1,000, 0.3%); south-west (2 of 1,000, 0.2%) and the north-east (1 of 1,000, 0.1%).

Table 1 also shows that the incidence of flooding that caused harvest failure is generally higher than the incidence of destruction of harvest by fire in Nigeria. On the whole, 66 of 1,000 (6.6%)

households experienced flooding that caused harvest failure in Nigeria. This flooding occurs far more frequently in rural rather than urban areas where 93 of 1,000 and 8 of 1,000 households experienced same respectively. Harvest failure owing to flooding was highest and lowest in the south-south and south-west regions where 145 of 1,000 (14.5%) and 5 of 1,000 (0.5%) households recorded same respectively. The proportion of households where harvest failure owing to flooding were experienced increased from the north-west (82 of 1,000; 8.2%) to the north-central (61 of 1,000; 6.1%) and to the north-east (52 of 1,000; 5.2%). This proportion was relatively lower in the south-east (36 of 1,000; 3.6%).

Table 1: Incidence of selected environmental shocks in Nigeria

S/No	Region	Households reporting destruction of harvest by fire (%)	Households reporting flooding that caused harvest failure (%)
1	North-central	1.1	6.1
2	North-east	0.1	5.2
3	North-west	0.3	8.2
4	South-east	2.0	3.6
5	South-south	1.1	14.5
6	South-west	0.2	0.5
7	Urban	0.5	0.8
8	Rural	0.9	9.3
9	Nigeria	0.8	6.6

Source: Extracted from the report of the 2018/19 GHS-Panel (NBS, 2019).

The average amount of money accrued from the sale of unprocessed crops in Nigeria was ₦112,774. Rural farmers earned a little higher (₦114,398) than urban farmers (₦101,206) from selling unprocessed crops. Across Nigeria's geo-political regions, the average amount of fund recouped from the sale of unprocessed crops was highest in the south-west region (₦318, 254) while the second highest was recorded in the north-central (₦146,886). Fund accrued in south-west is 116.7% higher than north-central's. Average money realized from selling unprocessed crops is quite comparable in the north-west (₦77,168) and the north-east (₦73,168) and higher than south-south region's (₦65,277). This fund was lowest in the south-east region (₦46, 271).

Earnings accrued from selling processed crops were generally lower than those accrued from unprocessed crops, suggesting the gap in value

addition to crops in Nigeria. On the whole, ₦44,593 was accrued on the average in Nigeria, from selling processed crops. This amount is close to, but marginally higher than the amount recouped in rural Nigeria (₦43, 931). The amount recouped in urban Nigeria is notably higher (₦50, 400) than rural's. Incidentally, the highest earning from the sale of processed crops was recorded in the north-east (₦71,370), suggesting that the north-east is foremost in championing value addition for agricultural crops in Nigeria. The south-west recorded the second highest (₦65, 973), followed by the north-west (₦52,917). Earnings from the sale of processed crops were quite comparable in the south-south (₦36, 992), north-central (₦34, 093) and the south-east (₦30,417). Mean total sales of unprocessed and processed crops in Nigeria is presented in table 2.

Table 2: Indices of Agricultural revenue in Nigeria

s/no	Region	Mean total sales of unprocessed crops (₦)	Mean total sales of processed crops (₦)
1	North-central	146,886	34,093
2	North-east	73,168	71,370
3	North-west	77,734	52,917
4	South-east	46,271	30,417
5	South-south	65,277	36,992
6	South-west	318,254	65,973
7	Urban	101,206	50,400
8	Rural	114,398	43,931
9	Nigeria	112,774	44,593

Source: Extracted from the report of the 2018/19 GHS-Panel (NBS, 2019).

The correlation coefficients on Table 3 indicates that destruction of harvest by fire ($r = -.268, p > 0.05$) and flooding that caused harvest failure ($r = -.217, p > 0.05$) are negatively but insignificantly related to mean total sales of unprocessed crops. As these shocks increases, revenue from unprocessed crops decreases but this is not significant. On the other hand, destruction of harvest by fire ($r = -.996, p < 0.05$) is negatively, strongly and significantly

related to mean total sales of processed crops but flooding that caused harvest failure ($r = -.300, p > 0.05$) is insignificantly related to same. These findings generally lend empirical credence to the notion that environmental shocks and agricultural revenue are opposing social realities in Nigeria. Meanwhile, destruction of harvest by fire is the single most important correlate of earnings from sales of processed crops.

Table 3: Relationship between pairs of Environmental Disasters and Agricultural Revenue

Environmental Disasters		Mean total sales of unprocessed crops	Environmental Disasters		Mean total sales of processed crops
Destruction of harvest by fire	Spearman's r p value	-.268 .486	Destruction of harvest by fire	Spearman's r p value	-.996 .000
Flooding that caused harvest failure	Spearman's r p value	-.217 .576	Flooding that caused harvest failure	Spearman's r p value	-.300 .433

Source: Computed from data extracted from the report of 2018/19 GHS-Panel (NBS, 2019).

DISCUSSION

Results have indicated that the incidence of destruction of harvest by fire and flooding that caused harvest failure is quite noticeable across Nigeria. The incidence as well as intensity of disasters is getting higher in recent Nigerian history (Olorunfemi, 2008). Previous reports have shown that among farming households in Borno, northern Nigeria, 7.5% and 28.3% of households suffered from bushfire and flood respectively (Bwala and Bila, 2009). The study of Meludu (2011) in Ogun

state, southwestern Nigeria shows that 55.0% and only 2.0% of farmers regarded flooding and fire as the greatest risk to their livelihood respectively. Emerole and Anyiro (2014) conducted a survey among farmers in Isiukwuato, southern Nigeria and reported that 85.0% and 63.3% of respondents perceived fire outbreak and flooding as greatest natural hazards confronting farmers. Flooding and fire outbreaks are considerably environmental disasters in Nigeria which requires concerted efforts to deal with. Olawumi (2009) reported that floods

were encountered as a result of heavy rainfall and inadequate watershed management. Nasimiyu *et al.* (2017) asserted that fires are caused naturally or through human action (anthropogenic disasters) and even the nature-caused fire disasters are provoked by human actions or lack of it. These imply that even as flooding and fire outbreaks are naturally instigated, human consciousness and efforts are potent in stemming their tides.

The average earnings from the sale of unprocessed crops in Nigeria is rather meagre. They reflect Nigeria's low agricultural productivity profile. According to the Food and Agricultural Organization- FAO (2020a), the challenges of Nigerian agriculture are enormous thereby accruing poor productivity including high postharvest losses and waste. Although the highest average earning from the sale of unprocessed produce across Nigeria's six geo-political region (₦318,254) is over 10 times higher than Nigeria's new monthly minimum wage of ₦30,000, the lowest earning across these regions (₦46,271) is only fairly better than the minimum wage. It is noteworthy that earnings in question are accruable seasonally and not monthly like the minimum wage. The nationally representative survey among Nigerian farmers reported by Anderson *et al.* (2017) shows that 82% of respondents do not sell their produce at all. In other words, a vast majority of Nigerian farmers are subsistent farmers. Anderson *et al.* (2017) further reported that only one type of crop was grown for trading among 10% of respondents, while only 8% of them produce more than one crop type for sale. Yet, the economy of rural communities is said to be championed by these smallholder-subsistence farmers (Nwajiuba, 2012).

Earnings accrued from the sale processed crops were even more meagre. The highest and lowest from the regions was ₦71, 370 and ₦30,417 respectively. This is an indication of the poor level of value addition to agricultural produce in Nigeria. The FAO (2020a) asserted that in the last two decades, value-added per capita in Nigerian agriculture has only increased marginally, lower than 1% every year. In their study among 408 farmers across the five states of south-eastern Nigeria, Ugwu and Alimba (2018) reported that 57% of respondents sell their produce unprocessed,

35% sell processed and unprocessed produce while only 7% sell their produce in the form of processed goods only. There is indeed a good cause to champion value addition to Nigerian farm produce. Alufohai and Eronmwon (2014) reported that the net profit for unprocessed plantain was ₦15.70 which increased to ₦274.11 when it was processed into fried chips. Further, net profit amounted to ₦372.77 when plantain was processed into dried chips or ₦405.31 when it was processed into plantain flour. Value addition is prominently important but earnings accruable from same in Nigeria has shown that Nigerian farmers are taking little advantage of the viable opportunity that value-addition affords.

The reported relationship between pairs of environmental disasters and agricultural revenue add to the bulk of existing positions accentuating the negative consequences of environmental shocks. Environmental shocks including fire disasters affect virtually all social sectors negatively (Nasimiyu *et al.*, 2017). The analysis of Papaioannou (2016) for instance indicated that there is clear-cut causal bearing of climatic shocks on the development of social conflicts in Nigeria. Floods results in calamitous consequences for farmer's income and food insecurity (FAO, 2020b). Efforts designed to propel poverty reduction and sustainable developments are hampered by Nigeria's high vulnerability to disaster and low level of disaster-preparedness (Olorunfemi, 2008). In this light and in the light of current findings, flooding and fire outbreaks are elements of environmental shocks functioning as drains on Nigeria's agricultural revenue.

CONCLUSION

Destruction of harvest by fire and flooding that caused harvest failure are noticeable experiences among Nigerian farmers but the latter is more pronounced. Earnings from the sale of unprocessed and processed agricultural produce in Nigeria are quite scant and reflective of Nigeria's low agricultural productivity profile. Funds accrued from processed products are scantier and therefore reflect poor state of value addition to Nigerian agricultural produce. Greater incidences of flooding and fire outbreaks accrue dwindling agricultural revenue. Empirical impetus is accorded the notion

that flooding and fire outbreaks are environmental shocks operating as drains on Nigeria's agricultural

revenue.

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