

Extended Abstract
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Paper/Poster Title	Paper/Poster Title
Gendered Effects of Crop Diversification and Climate Shocks on Household Food Security Status in Nigeria	

Abstract prepared for presentation at the 97th Annual Conference of the Agricultural Economics Society, The University of Warwick, United Kingdom

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Abstract	<i>200 words max</i>
<p>This paper studies the effect of climate shocks and crop diversification on household food security in Nigeria by focusing on gender-disaggregated effects. We combine historical rainfall and temperature datasets with the World Bank Living Standards Measurement Study-Integrated Surveys on Agriculture (LSMS-ISA) for Nigeria. Further, we use an adapted version of the Crop Diversification Shannon index (WSI) to measure crop diversification. The adopted food security indicators are the Household Dietary Diversity Score (HDDS), the reduced coping strategies (rCSI), and the food per capita expenditures. We use a set of panel and dynamic panel models for our analysis, and our results show that climate shocks have negative effects on food security, especially in households with women plot managers. However, we find that crop diversification is positively linked to food security. Our results show the need to target policies to encourage crop diversification in households and promote crop diversification components in women empowerment programs.</p>	
Keywords	Climate change, Gender, Diversification, Food security
JEL Code	D1, D13, C23, O13, Q54
Introduction	<i>100 – 250 words</i>
<p>Climate shocks represent a major constraint for households' food security status as it disrupts crop production, hence food availability and accessibility (De Pinto et al. (2020)). A large proportion of households in Sub-Saharan Africa (SSA) are reliant on agriculture, producing food for home consumption (Bjornlund et al. (2019)). In Nigeria FAO (2020) and Ecker and Hatzenbuehler (2022) note that about 44.1% of the population were moderately or severely food-insecure from 2017 to 2019. Recent studies suggest that crop diversification is important in promoting</p>	

household food security by increasing agricultural production and diet diversity while conserving the soil (Tesfaye and Tirivayi (2020). However, the crop diversification capability of households or individuals is limited by access to land, inputs, and information, especially for women in SSA. Although the role of women in mitigating the effects of climate change on households' food security status is important, no study has assess that to the best of our knowledge. This study contribute to expand the literature on how reduced agricultural labour affects food. By combining a comprehensive and recent household panel survey with a historical rainfall and temperature dataset, it emphasises on the role of women in improving household food security status. The study also innovate by using plot managers rather than household heads to explore the gender dimension for this study.

Methodology

100 – 250 words

We construct a theoretical model and use dynamic panel method among others as identification strategies. While climate data are monthly drought and flood from monthly total rainfall and average temperature data for all the coordinates within Nigeria Federal States for the period 1981 to 2019 (Centre for Environmental Data Analysis, United Kingdom), household data are drawn from 4 waves (2010/2011, 2012/2013, 2015/2016, 2018/2019) of the World Bank/National Bureau of Statistics LSMS-ISA data of Nigeria. Three different measures of food security status are retained, namely Household Dietary Diversity Index (HDDS), reduced Coping Strategy Index (rCSI) and the per capita food expenditures, whereas crop diversification is captured by a multidimensional measure, the Shannon index (SI). Plot managers is used to proxy the gender dimension rather than household heads. Spatial correlation, heterogeneity, and reverse causality biases are corrected through the Percentile Weight Regression, robust standard errors and the instrumental variable approach respectively.

Results

100 – 250 words

Results show that climate shocks negatively impact households' food security status in Nigeria as predicted by the literature. In other words, climate shocks (drought and flood) are negatively linked to the logarithm value of food PCE. A rise in extreme dryness, that is drought, is linked to a 14.1% fall in household expenditure on food, while a rise in excess water, which can indicate a flood shock, is linked to a 66.9% fall. Climate shocks also have a negative and significant impact on the food security status of



households with men and women plot managers. A rise in extreme dryness that is drought, is linked to 5 unit reduction in the number of food groups consumed by households with male plot managers. Excess water, that is, flood shock is linked to large and significant fall in female plot managers' household expenditure on food. Crop diversification is constrained by different factors, such as that limited access to large land areas and poverty status and education level –more so for households with women plot managers—. Findings conclude that, the less severe climate shock for female combined with the high diversification of crops makes households with female plot managers to be more food secure.

Discussion and Conclusion

100 – 250 words

The negative effect of climate shocks on household's food security in Nigeria might be explained by the crop production risks drawn from the climate shocks, which represent an increasing threat to diversification strategies. More precisely, it reduces productivity, food availability, and accessibility in rainfed constraints. Our results corroborate those found in the other empirical works, including those of Thompson et al. (2010) and Pickson and Boateng (2022) on SSA households, Demeke et al. (2011), Wossen and Berger (2015) on Ghana, McLaughlin (2021) in Malawi, and Mwesigye (2021) and Björkman-Nyqvist (2013) in Uganda. These findings encourage households to take up crop diversification strategies to mitigate the effect of climate shocks. Such crop diversification strategies may include training households on such strategies and providing cash transfers and subsidies to help households diversify easily. Households should also be provided with access to inputs such as land, fertilizer, and seeds to diversify easily.

The results which confirm the rainfall-gendered inequality suggest that government and non- government organizations should address the problem of climate shock on households, and plausible solutions such as crop diversification policy options should be focused on households with predominantly women plot managers. Finally, women empowerment programmes should include components that can help women easily diversify.

Future studies might try to understand and thoroughly explore the possible factors (such as agency issues) that aggravate the climate effects on women and hinder women's resilience to climate shocks.