Strengthening Household Nutrition in Senegal: Addressing Gendered Impacts of Food Price Volatility

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Background and problem

Recurrent global food price crises have pushed food security to the top of the international political agenda (Swinnen and Squicciarini, 2012; FAO, IFAD, and WFP, 2013). One in nine people worldwide and four in nine in sub-Saharan Africa cannot meet their energy requirements for food (FAO, 2015). Gender discrimination probably impacts women more heavily in many African countries (Etwire et al. 2022). Additionally, 37 million people in sub-Saharan Africa, 42.3% of whom are women, fell below the poverty line in 2021 because of volatile prices for essential goods (UNCTAD, 2021).

Food price volatility refers to seasonal, abrupt, or unexpected variations in food prices relative to the long-term price trend (IFPRI, 2011). While gradual fluctuations reflecting predictable seasonal patterns are not a concern, large, frequent, and unidirectional price fluctuations pose significant problems. High, volatile, and unstable prices create uncertainties and risks for producers, traders, consumers, and governments, potentially having considerable negative consequences for the agricultural sector and household food consumption.

In Senegal, staple food price volatility surged to 17.3% in 2022, up from 2.2% in 2021, with rice and wheat prices rising sharply by 25% and 16.7%, respectively (ANSD, 2022). Prices continued to increase by 7% in 2023, contributing 3.9% to the annual inflation rate, driven by factors such as terrorist pressure in the Sahel zone, the Russia-Ukraine war, market failures, and climate change (Kalkuhl et al., 2016). This volatility is evident in the food price index, which exhibited significant variations: 3.7% between 2016/2017, 1.1% between 2017/2018, 1.0% between 2018/2019, 2.6%

between 2019/2020, 2.9% between 2020/2021, 15.1% between 2021/2022, and 7.2% between 2022/2023 (ANSD, 2023).

To address food price volatility, the Senegalese government has implemented various measures, including market regulation, food subsidies, social safety nets, and risk management policies, to mitigate adverse effects and protect vulnerable populations. Beyond regulatory frameworks, the government has launched agricultural market development programs, such as the Great Agricultural Offensive for Food and Abundance (GOANA), the National Program to Support Food Security and Resilience, the Program to Accelerate the Cadence of Agriculture (PRACAS), and the Cooperation Framework to Support the "New Alliance for Food Security and Nutrition" (NASAN), among others (SNSAR, 2016).

Figure 1: Food price volatility

Source : ANDS, 2023

Despite these policy interventions aimed at improving household food security and building resilience, the situation persists, and the gender gap in food and nutrition insecurity continues to widen. This is consistent with the adverse effects of food and nutrition crises Senegal experienced between 2005 and 2020, which disproportionately affected women. Indeed, Senegal's Gender Inequality Index score of 0.530 ranks it 131st out of 191 countries, highlighting significant gender disparities. Notably, women's labor force participation rate stands at 35.2%, compared to 58.6% for men, and a notable wage gap persists, with pay differences for similar tasks.

Figure 2: Perception of food price volatility

Source: Capture on the Senegalese food market

Caption: Senegalese market offering a variety of food products, highlighting different cultures, prices, and the importance of local agriculture. This image illustrates the richness of food biodiversity and the essential role of local markets in food security.

While numerous studies have examined food price volatility related to seasonal variations and agricultural commodity cycles (Kaminski et al., 2014; Levin and Vimefall, 2015; Harttgen et al., 2016; Anriquez et al., 2013; Kane et al., 2015; Timmer, 2017; Devereux et al., 2020; Minot, 2014), few have investigated the perception of food price volatility and its impact on household consumption quality, particularly from a gender perspective. Moreover, limited research exists on the specific context of Senegal. This study aims to fill this knowledge gap by conducting a gender analysis of the effect of perceived food price volatility on household consumption quality in Senegal.

Methodology

To achieve our objective, we utilize the 2018/2019 Harmonized Household Living Conditions Survey (EHCVM) conducted among 66,120 individuals and 7,156 households by the National Institute of Demography and Statistics of Senegal (INDS) with technical and financial support from the Programme d'Harmonisation et de Modernisation des Enquêtes sur les Conditions de Vie des Ménages (PHMECV) of the West African Economic and Monetary Union (UEMOA). We employ a two-stage instrumental variable approach using two-stage least squares (2SLS). The first stage predicts the perceived price volatility, which is then introduced in the second stage to address the endogeneity of consumption quality. Our instrumental variables include the predicted value of perceived price volatility and the proportion of households per region reporting an unexpected rise in food prices. This approach allows us to account for regional nuances and better understand the factors influencing household consumption quality (Buzigi and Onakuse, 2023; Kane et al., 2015).

Following the literature, we approximate food consumption quality using the Household Food Consumption Score (HFCS), which reflects the quantity and quality of diet based on a seven-day recall of food types, groups, and consumption frequency (Maxwell et al., 2014; Vaitla et al., 2017). We define perceived price volatility as a shock experienced by households when negatively

affected by high food prices (Deaton, 1980; Amolegbe et al., 2021). This perception is represented by a binary variable, where 1 indicates that the Senegalese household perceives an unexpected increase in food prices, and 0 otherwise.

Findings

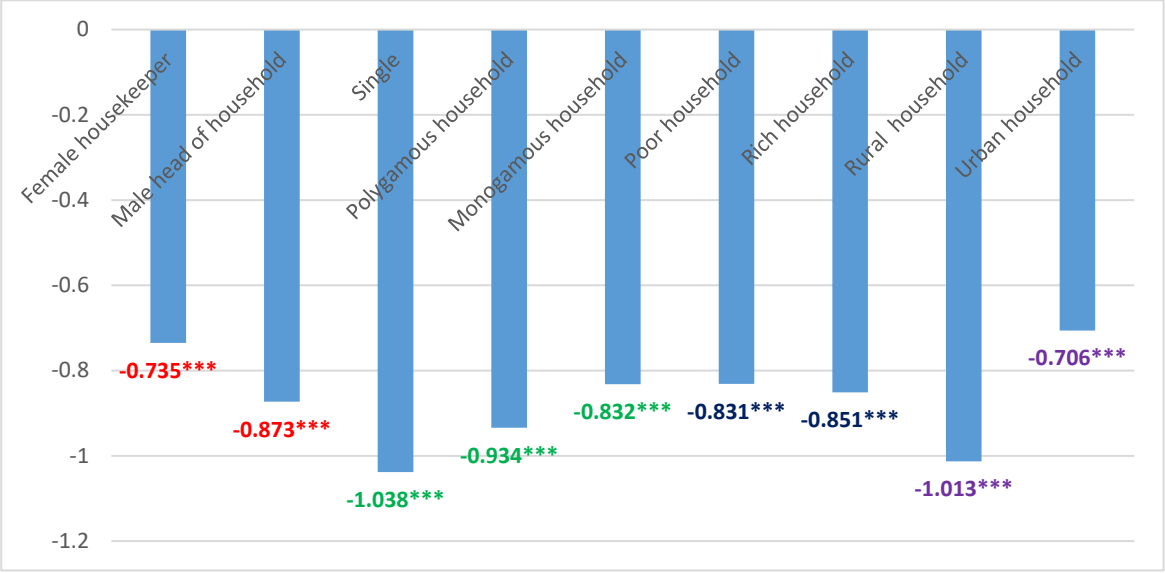
The Household Food Consumption Score for Senegalese households range from 0 to 112. Our analysis reveals that 1.33% of households have a poor diet, 2.25% have a limited diet, and 96.42% have an acceptable diet. Notably, urban areas have a higher proportion of households with acceptable diets (97%) compared to rural areas (95%). Additionally, female-headed households are more likely to have acceptable consumption (96%) than male-headed households. We also find that married households allocate a larger share of their income to food consumption compared to single households. Furthermore, households above the poverty line tend to spend more on food than those below it.

Perceived food volatility significantly reduces consumption quality, measured by the household consumption score.

- The perceived volatility of food prices significantly reduces consumption quality, as measured by the household consumption index. This effect occurs regardless of the gender and marital status of the head of the household, the standard of living, and the place of residence of the household.
- The unexpected rise in food prices has significantly reduced the quality of household consumption in Senegal due to the high poverty rate, which stands at 53.3% in rural areas and 20% in urban areas.
- Rising food prices disrupt household food programs, as households struggle to purchase the same quantity or variety of food, leading them to choose less expensive and less nutritious options.
- Depending on their financial situation, households are focusing on less expensive staple foods (mainly rice or bread), neglecting more nutritious products (fruits, vegetables, etc.). This change has a negative impact on the quality of food consumption.

The findings are consistent with Idakwo et al. (2022), which show that soaring food prices lead to a decline in household food quality.

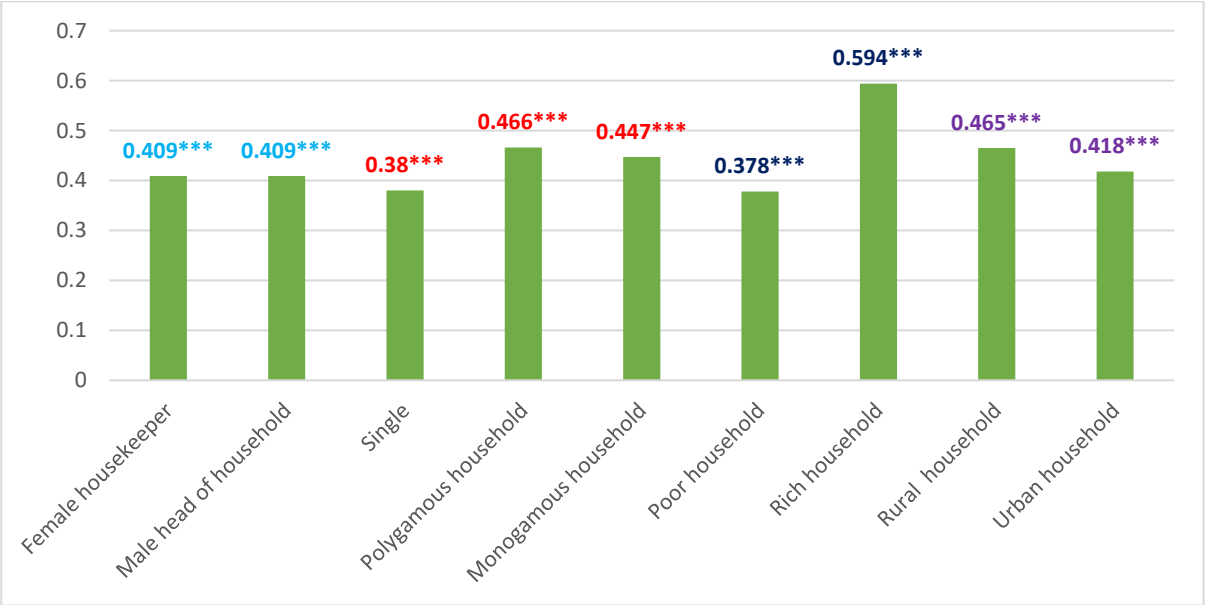
Figure 3: Effect of perceived price volatility on household food consumption quality



Source: Authors
Legend : Vertical axis : Indicators of the effect of consumption quality (estimated values). Bars : Level of effect on scores associated with different types of households and their characteristics. Negative values indicate a reduction in consumption quality ; Stars (***, **, *) indicate the level of statistical significance *= p < 0.05; ** = p < 0.01; *** = p < 0.001. These elements show the significant impact of household structure on consumption quality, with marked differences depending on household type and socioeconomic status.

As a robustness check, we examined the impact of perceived food price volatility on household food accessibility, defined as the ability to procure sufficient food in terms of quantity and quality to meet nutritional needs and support productive lives (WFP, 2009). The coefficient for this indicator is positive and significant at the 1% level, consistent across household characteristics such as head of household's gender, marital status, place of residence, and standard of living. Our findings indicate that perceiving rising food prices leads to a 45% increase in the share of expenditure allocated to food, reflecting the general price rise in Senegal. Notably, the effect of price shock on household food accessibility remains consistent regardless of the head of household's gender.

Figure 4: Effect of perceived price volatility on household food accessibility



Source: authors
Legend : Vertical axis: Indicators of the effect of consumption quality (estimated values). Bars: Level of effect on scores associated with different types of households and their characteristics. Stars (***, **, *) indicate the level of statistical significance *= p < 0.05; ** = p < 0.01; *** = p < 0.001. These elements show the significant impact of household structure on consumption quality, with marked differences depending on household type and socioeconomic status.

Policy implications

Our analysis reveals that perceiving an unexpected rise in food prices significantly reduces the quality of household food consumption in Senegal. This effect is reflected in a substantial negative impact on the consumption score and a corresponding increase in the share of income allocated to food, affecting household food accessibility. Furthermore, the perception of food price volatility is correlated with poverty level, place of residence, gender, and marital status of

the household head. Notably, unexpected food price increases affect consumption quality across various household categories, with a more pronounced impact on poor households, polygamous households, and rural households. While our findings are compelling, a limitation of this study is the use of cross-sectional data, which precludes dynamic analysis. Longitudinal data would have enabled survival analysis, potentially leading to more nuanced conclusions.

The government could enhance household nutrition and buffer the impact of food price volatility in Senegal by implementing targeted interventions. Key measures include:

- Developing support programs for vulnerable households, including targeted subsidies to offset increased food expenditure, particularly for low-income and female-headed households, by enhancing social safety net programs.
- Implementing policies to increase dietary diversity and strengthen household resilience during periods of high price volatility.
- Launching awareness-raising programs to educate households on maintaining consumption quality during price fluctuations, addressing gender inequalities.
- Establishing an early warning system for food prices through monthly bulletins on market prices, disseminated via media channels (TV, radio, social networks) to ensure households are informed.

Acknowledgements

This work received technical and financial support from the African Economic Research Consortium [AE/FAC/24-078 (grant 2607)] as part of the Policy Analysis for Sustainable and Healthy Food in African Retail Markets (PASHFARM) project, with funding support from the Bill & Melinda Gates Foundation (BMGF) – INV-042090. The authors would like to thank the members of the CREA research network for their valuable comments at various stages of the study. We thank the National Angency of Demography and Statistics of Senegal (ANDS) and the Program for the Harmonization and Modernization of Household Living Conditions Surveys (PHMECV) of the West African Economic and Monetary Union (UEMOA) for their technical and financial support in collecting the data used in this article. We would like to extend our special thanks to Prof. Kamgnia Dia Bernadette, who suggested that gender be considered during the various methodological workshops. We would also like to thank Professor Tsafack Nanfosso Roger of the University of Dschang and Professors Fomba Kamga Benjamin and Zamo Akono Christian of the University of Yaoundé II for their scientific guidance in the writing of this article. This article also benefited from the support of Professor BALLO Zie of Félix Houphouët Boigny University for his assistance in writing it as part of a research mobility program in Côte d'Ivoire. We would also like to thank the researchers at the Center for Applied Microeconomics Research and the Center for Economic and Management Studies and Research at the University of Yaoundé II for their various comments, as well as the anonymous editors and reviewers who provided comments and suggestions to improve the quality of this article.

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