Gender and effects of seafood and fruit enterprise performance on household access to food in Nigeria

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Abstract

Gender dynamics significantly shape the performance of small and medium-scale seafood and fruit enterprises (SMEs), with far-reaching implications for household food security and dietary diversity in Nigeria. Despite the critical role of women in these enterprises, they face systemic barriers including unequal access to resources, limited decision-making power, and cultural norms that confine them to less profitable roles. These challenges not only undermine the economic potential of women-led SMEs but also limit their capacity to contribute effectively to household nutrition and community food security. This study adopts a mixed-methods approach, integrating qualitative insights from focus group discussions with quantitative data from 720 gender-disaggregated enterprise owners in Anambra, Abia, and Taraba States. Drawing on the Harvard Analytical Framework, the research explores gender roles, disparities in resource access, decision-making power, and the effects of socio-cultural and institutional factors on enterprise performance and household nutrition. Findings reveal entrenched gender disparities in leadership roles, resource control, and capacity-building opportunities, with women disproportionately impacted by cultural norms and bureaucratic barriers. Despite these challenges, women demonstrate resilience and adaptability, as evidenced by higher cooperative membership and a stronger positive correlation between their income and dietary diversity compared to men. This indicates their critical role in enhancing household nutrition, often prioritizing food security over other expenditures. However, systemic barriers such as unequal access to credit, limited representation in leadership, and the dual burden of household and economic responsibilities constrain their potential. The study underscores the need for gender-sensitive policies that address structural inequalities, foster equitable access to resources, and promote women's leadership in SMEs. By empowering women and dismantling socio-cultural barriers, policymakers can unlock their untapped potential, ensuring sustainable enterprise growth and improved household welfare. These findings serve as a call to action for fostering inclusive agricultural development that benefits not only women but entire communities, advancing both food security and gender equity.

Keywords: Gender dynamics, gender disparities, labor productivity, small and medium-scale food enterprises performance.

1.0 Introduction

The nexus between gender dynamics and food security is a critical area of concern, particularly in developing countries like Nigeria, where agricultural enterprises, including seafood and fruit

sectors, play a vital role in sustaining livelihoods and ensuring household access to nutritious foods (Smith et al., 2010; Gulyas and Edmondson, 2023). However, persistent gender gaps in these enterprises significantly influence the overall performance and, by extension, the ability of households to access a diverse and nutritious diet (Klapper and Parker, 2011; Butkouskaya et al; 2020; Birhanu et al., 2022). Gender equality has become an imperative for seafood and fruits sector to play its vital role in ensuring access to nutritious food. In this regard, there is urgent need for gender dynamism in all sectors including seafood and fruits sector. Gender dynamics refer to the ways in which society's expectations and norms regarding gender roles influence interpersonal interactions, power structures, and authority within various contexts, particularly in the formal and informal workplace and humanitarian settings. These dynamics are shaped by cultural, social, and economic factors, leading to different experiences and treatment of individuals based on their gender. In the context of this study, gender dynamics refers to the roles, relationships, and power structures that influence how men and women engage in the seafood and fruit enterprises. These dynamics significantly affect access to resources, decision-making, overall participation, and performance of men and women in the enterprises (Pyburn et al., 2023). Gender dynamics often dictate the types of roles men and women play within seafood and fruit enterprises. Gender roles in seafood and fruit enterprises are typically defined by socio-cultural norms that allocate specific tasks and responsibilities to men and women. For instance, men generally dominate the more lucrative, resource-intensive segments of these industries, such as deep-sea fishing, large-scale trading, and fruit exportation (Barrientos and Kritzinger, 2004; Alonso, 2022). Conversely, women are often confined to less profitable roles, including post-harvest processing, small-scale marketing, and selling at local markets (Hassan et al., 2013). This gendered division of labor is deeply entrenched in agricultural enterprises and often results in disparities in income, resource access, and decision-making power between men and women, perpetuating gender stratification and affecting economic efficiency (Pyburn et al., 2023).

Studies have shown that households engaged in more productive seafood and fruit enterprises tend to have better nutritional outcomes, including increased dietary diversity (Kawarazuka and Béné, 2010; Gulyas and Edmondson, 2023). However, the benefits of these enterprises are often unevenly distributed, with women frequently bearing the brunt of food insecurity due to their limited access to resources and decision-making power (Aziz et al., 2021). In spite of the importance of seafood and fruit enterprises in providing nutritious foods, there is a lack of comprehensive research on the gender dynamics within these enterprises and their effects on household access to foods and dietary diversity in Nigeria. This study aims to address this gap by analyzing how gender dynamics influence the performance of seafood and fruit enterprises and how this affects household access to nutritious foods in Nigeria. Understanding these gender dynamics and their effects on men and women-owned seafood and fruit enterprise performance and household nutrition is critical for developing targeted interventions that promote equitable access to resources, enhance the sustainability of these enterprises, and improve dietary diversity. The study will provide insights into the barriers women face in agricultural enterprises and explore ways to enhance their participation in seafood and fruit enterprises, ultimately improving food security and nutrition outcomes for households in Nigeria.

Literature review

There is a global gap of 17 percentage points between the ownership of an enterprise rate in the active population of women and that of men, that is 53% and 70%, respectively (World Bank, 2015).These disparities in the women-run and men—run enterprise is even more pronounced when one looks at African countries. In sub-Saharan Africa, for example, In

Nigeria, the results of the Small and Medium Enterprise Development Agency of Nigeria (SMEDAN) shows that women entrepreneurs account for 42.1 percent in the ownership of 32,414,884 micro-enterprises and 13.6 percent of 21,264 small enterprises and none in 1,654 medium enterprises (SMEDAN, 2010). This results indicate that, compared to men, women are still less likely to be employed in medium enterprises. Gender attitudes and practices in the labour market in Nigeria are rooted in a traditional patriarchal system that limits the economic advancement of women. Indeed, although the enterprise ownership trends of women have improved as women-run enterprise is on a positive trajectory and has been rising in both rural and urban areas through the period 1990-2009 but remains lower than that of males (World Bank, 2019), the sociological and cultural burdens still relegate Nigerian women to second place. Thus, the sociocultural burdens reduce their activities, mostly in order to fulfil family commitments and due to maternity constraints (Makama, 2013; Sharma et al., 2016). Prejudices, traditions and customs still limit the engagement of women in medium enterprises and their participation in higher-value activities, they can generate more income, thus increasing their capacity to contribute to household food access. Beyond these sociocultural barriers are economic barriers, including lack of equity and lack of access to institutional credit, which still severely limit women's engagement in entrepreneurship in Nigeria. These barriers amply testify to the persistence of disparities in levels of participation by gender in the ownership of enterprises in Nigeiria. This is despite the efforts made by national, regional and global authorities in favour of gender equality and the advancement of women. Reports from Nigeria indicate that women are underrepresented in formal employment sectors and leadership roles, with only 6% holding seats in national parliament compared to an average of 24% across Sub-Saharan Africa (Enfield, 2019). Significant gaps remain despite the efforts made for achieving Sustainable Development Goal (SDG) 5 adopted by the General Assembly of the United Nations, aimed at ensuring equal opportunities between women and men in all sectors, and in particular in the field of employment.

Literature on gender equality and access to food is also relevant to this study. Aceess to food is a situation where each family (household) should have bodily (physical), social and economic access to sufficient food to meet her needs; which means that each family must have the knowledge and aptitude to produce or procure the food that it requires on a sustainable basis (FAO, 2007).Nevertheless, having access to food can be limited physically by wash-out roads in a rainy season which can be responsible for cutting off access to the nearby village market; thus, economic access to markets is an essential factor in food insecurity (WFP, 2009). In many contexts, gender is a key determinant of who has access to and control over resources, how those resources are used across food systems, and how outputs and resulting incomes are managed. In periods of stress or crisis, gender norms affect who is exposed to which stresses and shocks. Norms also shape men and women’s roles, voices, and agency in food system institutions, informing decisions such as who engage in different enterprise, how labor and inputs are allocated across different enterprises, and how and by whom different activities in different enterprises are carried out in food system (Malapit 2019).

1.1Research questions

- What are the gender roles within seafood and fruit SMEs in Nigeria??
- What are the gender disparities in access to and control over resources, and decision-making power within the seafood and fruit SMEs?
- How do socio-economic, cultural norms and institutional factors influence gender equity within the seafood and fruit SMEs?
- How do gender disparities in the performance of the seafood and fruit SMEs influence household access to food and dietary diversity?

1.2 Objectives

- Identify gender roles within seafood and fruit SMEs in Nigeria.
- Examine gender disparities in access to and control over resources, and decision-making power within the seafood and fruit SMEs.
- Investigate gender disparities in socio-economic, cultural norms and institutional factors affecting the seafood and fruit SMEs performance.
- Determine gender disparities in the influence of the fruit and seafood SME performance on household access to food and dietary diversity.
- Given this background, we propose the following hypothesis;
- *H1: There gender roles of men is significantly different from that of women-owned seafood and fruit enterprises.*
- *H2: There are significant difference in the access and control of resources and decision-making power between men and women-owned seafood and fruit enterprises.*
- *H3: Socioeconomic, cultural norms and institutional factors affects the performance of men and women differently within seafood and fruit SMEs.*
- *H4: The association between the seafood and fruit enterprise performance and household access to food and dietary diversity significantly differ between men and women-managed enterprises.*

2.1 Conceptual framework

The conceptual framework, illustrated in Figure 1, draws on the Harvard Analytical Framework to examine gender dynamics within seafood and fruit SMEs and their influence on household food security and dietary diversity. Figure 1 illustrates how various gender, cultural, and policy-related factors interact to contribute to household food security and nutrition. At the center of this process is access to and control over resources, which is shaped by gender disparities in control and decision-making, as well as gendered resource allocation and spending. These elements determine who holds control over resources and how they are utilized within households and communities. Cultural norms also play a crucial role, as they influence access and control over resources by defining gender roles and expectations, which impact decision-making power and economic activities. Additionally, gender-sensitive policies and institutional support help improve market access, providing individuals, particularly women, with better opportunities to engage in economic activities and resource utilization. Improved access to resources leads to enhanced enterprise productivity and economic performance, both of which directly support household food security and nutrition. Experience also contributes to economic performance by adding value through skills, knowledge, and accumulated learning that improve productivity. Together, these interconnected pathways illustrate how gender dynamics, cultural influences, and supportive policies collectively enhance food security and nutritional outcomes within households.

The Activity Profile in the Harvard Framework categorizes the distinct tasks and responsibilities of men and women within seafood and fruit SMEs. Typically, men and women have different roles within these enterprises, with men often engaging in higher-revenue activities, such as wholesale trade, while women tend to handle labor-intensive tasks like processing and local sales. This division of labor impacts productivity and economic outcomes, as well as the degree to which each gender can contribute to household food security. Studies show that when women are relegated to lower-income activities within SMEs, their contributions to household food and dietary diversity may be limited (Kabeer, 1999; Peterman, Behrman & Quisumbing, 2014). However, when women's roles are expanded to include higher-value activities, they can generate more income, thus increasing their capacity to

contribute to household food access and diversity (FAO, IFAD, UNICEF, WFP & WHO, 2019). Recognizing these distinct activities within SMEs, this framework underscores the importance of enabling women to access roles that are traditionally dominated by men to enhance household food security.

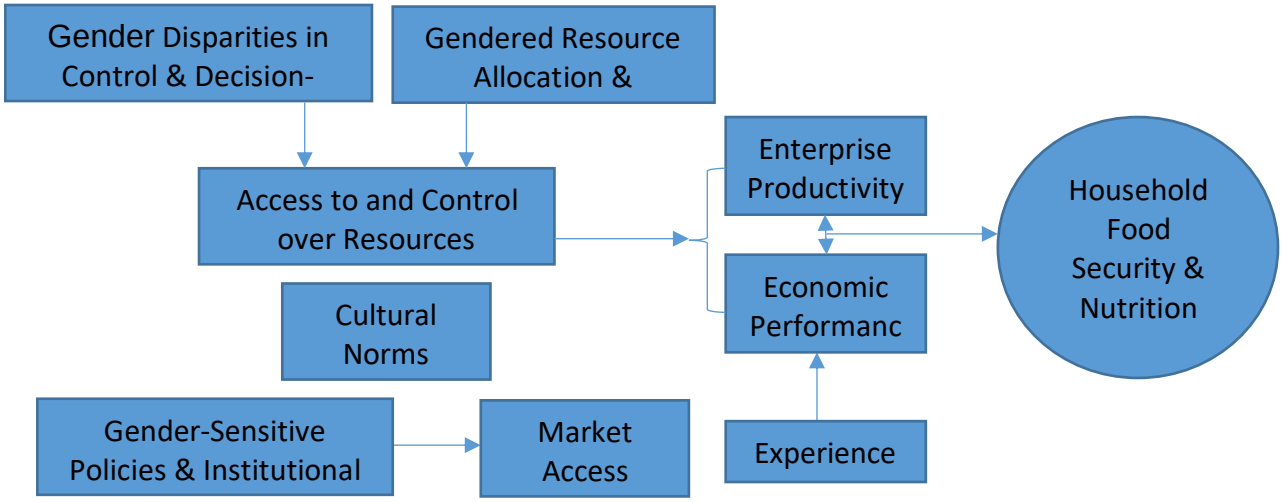

Figure 1: Conceptual Framework: Gender Dynamics in SME Contributions to Household Food Security and Dietary Diversity

The Access and Control Profile is central to understanding gendered disparities in accessing and managing resources within SMEs. This profile highlights the resources—such as credit, technology, market information, and income—that are available to men and women, as well as the degree of control they have over these resources. In the context of seafood and fruit SMEs, women often face barriers in accessing financial resources and market information, which limits their economic potential and reduces their ability to invest in household food security. Gender-based constraints on resource control also mean that women may have limited authority over income allocation, even when they contribute significantly to household earnings (Quisumbing & Maluccio, 2003). The conceptual framework suggests that addressing these access and control issues is crucial for enhancing food security and dietary diversity, as studies consistently show that women's control over income correlates with higher household expenditures on food and nutrition (Doss & Kieran, 2014). By improving women's access to resources and their control over income, policies can help to bridge the gender gap in resource allocation, thereby promoting more equitable contributions to household nutrition.

The third component, Influencing Factors, in the Harvard Framework examines the socio-cultural, economic, and institutional contexts that shape gender roles and resource access within SMEs. Cultural norms and institutional policies often dictate that women prioritize caregiving and household responsibilities over economic activities, restricting their capacity to participate fully in income-generating activities. These constraints limit the amount of time and energy women can dedicate to SME operations, impacting their income potential and, subsequently, household food security (Huyer et al., 2015; Johnson et al., 2016). Additionally, institutional barriers, such as a lack of gender-sensitive policies, reinforce these inequalities by failing to provide the support women need to access credit, training, and other critical resources. Addressing these socio-cultural and policy-driven barriers is essential for creating

an environment where women can engage equitably in SMEs, ultimately improving household food security and dietary diversity outcomes.

Integrating the Harvard Framework's Activity Profile, Access and Control Profile, and Influencing Factors into this conceptual framework highlights the central role of Gender Dynamics in Resource Control and Decision-Making. Control over income and resources is a critical determinant of how household funds are allocated, particularly for food and nutrition. When women have decision-making power over income, they are more likely to direct spending toward household welfare, including food and health needs, leading to better dietary diversity and food security outcomes (FAO, IFAD, UNICEF, WFP & WHO, 2019; Quisumbing & Maluccio, 2003). The conceptual framework posits that empowering women within SMEs by enhancing their access to resources and decision-making authority is crucial for maximizing the positive impact of SME income on household food outcomes.

Furthermore, this framework includes intermediate pathways that connect these core components to household food security outcomes. Gendered Resource Allocation and Spending Patterns, for example, illustrates how men and women differ in their spending priorities, with women generally focusing on food-related needs. This pathway aligns with findings in the Harvard Framework that indicate that women's resource allocation tends to favor household welfare, while men's allocations may prioritize non-food expenditures or savings (Kilic, Palacios-Lopez & Goldstein, 2015). Impact of Experience and Market Access is another pathway that reflects the role of experience in SME operations. Experience can enhance productivity and income stability, which directly supports household food security. However, gender-based barriers often limit women's access to markets and networks, constraining their ability to leverage experience for income growth (Peterman, Behrman & Quisumbing, 2014).

Lastly, Gender-sensitive Policies and Institutional Support within the framework addresses the need for policies that reduce gender-based barriers in SME environments. Gender-sensitive policies that support women's access to credit, provide tailored training, and promote equitable resource control are essential for empowering women to contribute to household food security effectively. As supported by the Harvard Framework's emphasis on external influences, creating institutional structures that recognize and support women's roles in SMEs can transform household food security outcomes, particularly in contexts where socio-cultural norms have historically constrained women's economic participation (Meinzen-Dick et al., 2019; Peterman, Behrman & Quisumbing, 2014).

Theoretical framework

The intersection of gender, enterprise performance, and access to food is a critical area of research that highlights the systemic inequalities affecting food security and nutrition. This intersection reveals significant insights into how gender influences enterprise performance and food accessibility. The theories focus on the impact of gender on small and medium enterprises (SMEs) as well as the implications of gender on food access. The first theory establishes the link between gender and enterprise performance while the other theory establishes the link between gender equality and access to food.

The first theory that was used to establish the link between gender and enterprise performance in this study is the liberal feminist theoretical viewpoints. This theory was originally developed in the work of Fischer et al (1993), asserted that the liberal feminist tradition goes back to the

very beginning of feminism and argues for the requirement of social reform so that women are made to enjoy the same status and openings as men. The central basis of the liberal theory undertakes that men and women are equal and that judiciousness, not sex is the foundation for individual rights. These viewpoints establish the fact that women entrepreneurs in Nigeria suffer business failure, premature (early) exit, stagnant growth, and poor (low) return on investment (African Competitiveness Report, 2017). However, in explaining the systematic variances why female entrepreneurs adopt an abridged growth intention and a smaller size of business, it shows that many women entrepreneurs in Nigeria are functioning below their ability. This is ascribed to prejudiced practices, low productivity, lack of access to resources, and limited entrepreneurships as well as leadership skills (African Development Report, 2015). Other issues include insufficient training, lack of information, inadequate management experience, insufficient infrastructural development, absence of strategies to develop financial literacy, restricted access to external loans for business sustainability, and poor support from family.

Gender equality can enhance enterprise performance by fostering innovation and productivity. When women have equal access to resources and decision-making power, they can significantly contribute to enterprise success. This is particularly relevant in fruits and seafood enterprise where women often manage household nutrition but lack the necessary support to optimize their enterprise capabilities. Gender inequality is both a cause and consequence of malnutrition. Women play a critical role in the nutrition and health of their families, yet they— along with children—are often the hardest hit by malnutrition. When women experience poor nutrition early in life, it reduces their learning potential, increases reproductive and maternal health risks, and lowers productivity, limiting women's access to resources (USAID, 2022). Gender roles, norms, and gendered access to and control over resources influence how women and men contribute to and benefit from the food system. This is particularly true in rural areas of low- and middle-income countries, where 40 percent of people work in the agricultural sector and large gender inequalities remain (USAID, 2022).

The second theory that was used to establish gender equality and access to food in this study originated from the work of Njuki *etal,* 2021, reveals that women are producers, workers, processors, traders, retailers and consumers. In spite of this, they face many challenges and limitations such as social, institutional and cultural barriers to access and adopt agricultural information, technologies, opportunities, resources and services. "The stark gender inequalities in food systems are both a cause and outcome of unsustainable food systems and unjust food access, consumption, and production. These exist within a broader social context, where there are constraints and limitations shaped by social and structural inequalities in food systems and society at large,". The central basis for this theory is that women play vital roles across the entire food enterprises from production, processing and marketing to consumption. Despite this, their contributions are often undervalued or overlooked in policy frameworks. Gender inequalities manifest in various forms, including limited access to resources such as land, financial services, and agricultural technologies. These disparities not only hinder women's owners of enterprises including seafood and fruits businesses but also exacerbate food insecurity within households and communities. Women and men play distinct roles in maintaining the four pillars of food security: as food producers, household gatekeepers, and managers of food stability during economic hardship. Women are pivotal in ensuring the nutritional security of their households, though their contributions are often overlooked in policy and legal frameworks, limiting their potential in enhancing food security.

Gender inequalities and gender norms restrict women's access to resources and services, such as land, knowledge, and food, leading to poverty and food and nutrition insecurity. Vulnerable women, particularly in female-headed households, face limited access to nutrition information and resources, making them more susceptible to food shortages, food insecurity, and

malnutrition. The gender gap in food insecurity continued to rise in 2022, with 27.8 percent of women experiencing moderate to severe food insecurity, compared to 25.4 percent of men (FAO SOFI 2023). Malnutrition in mothers can initiate a deprivation cycle, impacting child mortality, disease, educational performance, and work productivity. Educational attainment in women significantly influences child survival rates.

3.0 Methodology

To achieve the study objectives, we employed a mixed-methods research design utilizing the Havard framework in collecting the data. We conducted focus group discussions and analyzed quantitative data from a field survey of 720 gender disaggregated seafood and fruit enterprise owners.

3.1.1 Qualitative data

Focus group discussions were conducted separately with men and women seafood and fruit business owners in Anambra, Abia and Taraba States before the actual field survey to offer a nuanced understanding of gender dynamics within the seafood and fruit SME sector. In each state, we conducted focus group discussions with 24 men and women fruit and seafood enterprise owners, respectively. Overall, we conducted focus group discussions with 72 men and women fruit and seafood SME owners across the three states. The focus group discussants were selected with the assistance of state coordinators of fruit and seafood enterprises, and market chapter chairmen of fruit and seafood enterprises. Before commencing the FGD, the researchers obtained written and verbal consent, including consent for audio recording from the respondents. The FGD participants were asked questions from a structured focus group discussion instrument. These interviews delve into the gender roles, access to resources, decision-making power, changes in household's access to nutritious foods, and challenges faced by both genders, providing rich qualitative data to complement the quantitative analysis. By conducting separate interviews, we ensure that the unique perspectives and voices of men and women are captured distinctly, allowing for a comprehensive examination of gender roles, access to resources, and decision-making processes within seafood and fruit SMEs.

3.1.2 Quantitative data

We developed a structured survey questionnaire and also incorporated Food and Agricultural organisation (FAO) standard questionnaires on Household Dietary Diversity and Food Insecurity Experience for the field surveys. Information in the questionnaire was collected using the KoBoCollect Toolbox application. This mobile-based questionnaire was pre-tested with 20 men and women seafood and fruit enterprise owners at the Ogige market in Nsukka, Enugu State. Information collected in the survey questionnaire was within the Havard analysis framework and includes a gender-disaggregated demographic information of the respondents, employment and business participation, challenges and business influences, marketing network, business information, household food consumption patterns, household access to food, gender dynamics of food consumption, the economic impact of seafood and fruits enterprises, nutritional benefits and health outcomes, and perceived benefits and challenges.

We conducted field surveys between February and April 2024 in major seafood and fruit retail markets in the three states in Nigeria using the KoboCollect app. A multi-stage sampling procedure was employed for the study. The respondents were sampled from market participants from supply and demand regions. Three stages involved in the selection of sites and respondents were: (1) States (2) markets (3) marketers stratified into male marketers of seafood, female marketers of seafood, male marketers of fruits and female marketers of fruits in surplus and deficit regions. In stage one, stratified random and purposive sampling

techniques was used. States in supply region that formed strata A are: Yobe, Adamawa, Taraba, Bauchi, Kaduna, Kano, Jigawa, Katsina, Niger, Kebbi,and Sokoto States, while states in deficit region that formed strata B are: Imo, Anambra, Abia, Enugu, Ebonyi, Ondo, Osun, Oyo, Ekiti, Lagos, Ogun, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers States (Reported flow by seafood and fruits market participants). One state in surplus stratum was selected through simple random sampling technique, while two states in deficit stratum were purposively selected as they have the biggest market where seafood and fruits were marketed in the southern Nigeria. These gave a total of three states which constituted the sample. The sampled states were Taraba, Abia and Anambra.

The second stage involves the selection of the markets to use. Purposive sampling technique was used to obtain twelve markets. The selection was based on markets that had a preponderance of seafood and fruit enterprises to enable the researcher collect necessary data (Reported major markets by market participants). In Abia State, the retail markets visited were Ahia Ohuru, Alien, Cementary, and Umungasi. In Anambra State, the retail markets visited were Awada, Ose, Stockfish International Market, and Tarzan. In Taraba State, the retail markets visited were Garba Chede, Jalingo main market, Kasuwa Bera, and Sabongari.

The third stage sampling constituted selection of respondents. In each state, we collected a list of seafood and fruit SME owners from the market chapter chairmen of the fruit and seafood SME associations. From the list, we stratified the enterprise owners into small and medium levels depending on the size of their firms. Since our focus was on small and medium enterprise owners, we randomly selected sixty (60) men and women seafood enterprise owners in each of the four retail markets in each state. An equal number of fruit and seafood enterprise owners were sampled in each market. Therefore, 120 men and women fruit and seafood enterprise owners were each interviewed in each state. Small and medium enterprise owners in each state were interviewed at a ratio of 60:40. Overall, a total of 720 respondents were interviewed for the study.

3.2 Data analysis

Objective one which is aimed at identifying the gender roles or division of labor in seafood and fruit enterprises was analyzed by categorizing the roles and tasks performed by men and women in these enterprises into an activity profile. This will help identify gender-specific tasks and contributions to enterprise performance. To understand who has access to and control over resources, and decision-making within the enterprise (objective two), data on access to financial capital, education, technology, market information, decision-making power over enterprise income, and control over income was analyzed. This will help identify power imbalances, revealing whether men or women have greater control over resources, which could affect the performance of the enterprise and household food access. Objective three sought to examine how gender disparities in socio-economic, cultural norms and institutional factors affect seafood and fruit enterprise performance. The Havard framework will map out these gender-based barriers and also explore opportunities for improving women's roles in the seafood and fruit sectors. Analyzing these factors will help to understand how external conditions affect gender relations in enterprise performance. Finally, objective four explored how gendered enterprise performance affects household access to food and dietary diversity. First, the framework will help examine how gendered labor roles (as identified in the activity profile) and access/control over resources (as seen in the access/control profile) affect key business performance metrics like income. Quantitative data on business outcomes will be correlated with gendered roles to show if differences in resource control affect enterprise performance. Next, using the data on household dietary diversity, the framework will analyze

the connection between enterprise income (controlled by either men or women) and household food security. Gender-specific decision-making over how income from the enterprise is spent will be examined to see if and how gender influences food access. This will clarify whether income controlled by men or women leads to better nutritional outcomes and household access to food, providing insights into gendered spending patterns and their effects on food security.

For objectives 1 to 4, t-test and chi-square test were used to determine whether significant gender differences exist between men and women-owned seafood and fruit enterprises and gender roles, control and access to resources, decision-making power, enterprise performance, and household food access and dietary diversity. The household food access and dietary diversity will be analyzed using FAO standard methods. We will use the concept of business-related experience as a proxy for the enterprise performance of small-scale seafood and fruit enterprises as several empirical studies have found that an owner's previous experience in the industry in which the current firm operates is significantly and positively related to performance (Fatoki 2011; Robb & Watson 2012). However, according to Watson (2012), having prior business ownership experience is expected to be positively correlated with performance of a firm. This is likely to be the case as lessons learnt often translate into competent decision-making. Hence, we will control for industry and prior business ownership experience. In the first instance, we will compare performance between male and female owned firms and then correlate it with the household access to food and dietary diversity.

4.0: Results

4.1 Socioeconomic Characteristics of the Respondents (n = 720)

Table 4.1 provides a socioeconomic characteristic of the respondents with key insights relevant to understanding gender dynamics in Nigerian seafood and fruit enterprises.

Socioeconomic characteristics of the respondents

Age-wise, most respondents fall within the productive 21-40 years age group (51.8%), followed closely by those under 20 (48.1%), indicating that this sample captures a young and economically active population.

Table 4.1: Socioeconomic Characteristics of the Respondents

Variables	Women		Men		Total Sample	
	Freq	%	Freq	%	Freq	%
Sex	-	-	-	-	365	50.6
Male	-	-	-	-	355	49.4
Female						
Age						
Less than 20 years	179.0	50.4	51.0	42.5	346.0	48.1
21 – 40	175.0	49.3	69.0	57.5	373.0	51.8
Above 41	1.0	0.3	0.0	0.0	1.0	0.1
Marital Status						
Married	272.0	76.6	94.0	77.7	546.0	75.7
Single	51.0	14.4	23.0	19.0	110.0	15.3
Widowed	27.0	7.6	2.0	1.7	51.0	7.1
Divorced	4.0	1.1	2.0	1.7	13.0	1.8
Separated	1.0	0.3			1.0	0.1
Educational Background						
Higher Education	186.0	52.4	73.0	60.3	375.0	52.0
Secondary School	65.0	18.3	15.0	12.4	123.0	17.1
Primary School	43.0	12.1	19.0	15.7	100.0	13.9

Vocational/Technical Training	33.0	9.3	10.0	8.3	74.0	10.3
No Formal Education	28.0	7.9	4.0	3.3	49.0	6.8
Household Size						
Less than 6	186.0	52.4	73.0	60.3	375.0	52.0
7 – 12	65.0	18.3	15.0	12.4	123.0	17.1
13 – 17	43.0	12.1	19.0	15.7	100.0	13.9
Above 18	33.0	9.3	10.0	8.3	74.0	10.3
Monthly household Income						
Low (0–50,000)	144.0	41.5	35.0	28.9	281.0	39.5
Lower-middle (50,001–100,000)	110.0	31.7	39.0	32.2	215.0	30.2
Upper-middle (100,001–500,000)	76.0	21.9	42.0	34.7	181.0	25.5
High (above 500,000)	17.0	4.9	5.0	4.1	34.0	4.8

The marital status distribution reveals that a large portion (75.7%) are married. Education levels show over half (52%) of respondents have attained higher education. Regarding monthly income, a significant proportion (39.5%) falls within the low-income range (₦0–50,000), reflecting the economic challenges within this sector.

Gender roles within seafood and fruit SMEs in Nigeria

Women report a higher influence of family commitment on their work (80%) compared to men (71.07%), with a statistically significant difference (t = 2.1, $p < 0.05$). Regarding control over income, both men and women in this study report complete control. Nevertheless, leadership roles remain highly gendered, with men significantly more likely to hold decision-making positions (32.41% for men versus 17.59% for women; t = -1.75, $p < 0.05$). In terms of household production and food purchase decisions, women demonstrate a higher involvement than men, with 50.66% of women involved in household production decisions compared to 41.18% of men (t = -2.2, $p < 0.05$), and 50.99% of women in charge of food purchase decisions versus 23.14% of men (t = 3.5, $p < 0.01$).

Table 4.2: Gender roles within seafood and fruit SMEs in Nigeria

Variables	**Male (%)**	**Female (%)**	**T-test**
Family Commitment Influence	71.07	80	2.1**
Family Responsibilities Impact	80.16	82.82	0.8
Control Over Income	100	100	0
Leadership/decision role	32.41	17.59	-1.75*
Household production decisions	41.18	50.66	-2.2**
Food purchase decisions	23.14	50.99	3.5***
Equal Involvement in Food Decisions	68.6	70.99	0.45
Gender Difference in Food Preferences	10	4.87	-0.9
Work > 60 Hours/Week	28.57	21.61	-1.25
Productive Activities			
Primary producer of seafood/fruit sold	1.10	1.14	0.37
Reproductive Activities			
Change in Family responsibilities	60.00	61.41	0.38
Gender Role Changes in Meal Prep	18.49	15.27	1.5

4.3: Gender disparities in access to and control over resources, and decision-making power within the seafood and fruit SMEs

Women demonstrate greater access to transportation (24.79%) compared to men (15.21%), a statistically significant difference (t = 2.500, p < 0.05). Cooperative membership is another area where women (54.55%) exceed men (44.23%) with statistical significance (t = 1.900, p < 0.1). However, despite these advantages, women's participation in capacity-building programs remains low (5.63%).

Table 4.3: Gender disparities in access to and control over resources, and decision-making power within the seafood and fruit SMEs

Variables	Women	Men	T-test
Access to resources			
Own means of transportation (1.9)	24.79	15.21	2.500**
Own mobile phone (1.11)	100	99.44	0.9
Membership of cooperatives (3.4)	54.55	44.23	1.900*
Time spent in seafood and/or fruit business (3.12)	29.01	18.24	1.6
Education (% with formal education)	92.1	96.7	0.26
Benefits received from marketing organization (4.1)	26.76	37.19	-2.18***
Credit (4.2)	29.01	18.24	1.6
Capacity building (4.2)	5.63	4.96	0.28
Marketing information (4.2)	79.92	79.92	0.3
Nutrition information (4.2)	19.44	18.18	0.3
Access to labor (2.8)	16.34	10.74	1.49
Control over resources			
Control over income (3.8)	100	100	0
Decision-making power			
Decision to participating actively in seafood and fruits enterprises due to family commitments (3.6)	40.28	47.11	-1.31
Decision-making authority in seafood and/fruit business (3.9)	50.99	29.75	1.90*
Decisions related to the production of seafood and/or fruits in the household (3.11)	60.00	40.00	2.10**
Decisions regarding food purchases and consumption in the household (6.6a)	40.28	47.11	-1.31

Women report significantly higher authority in household production decisions (60% compared to 40% for men, t = 2.10, p < 0.05), reflecting their central role in managing food production and consumption within households.

4.4 Influence of cultural norms and institutional policies on gender equity within seafood and fruit SMEs?

The analysis of cultural norms and institutional policies impacting gender equity in seafood and fruit SMEs highlights significant gender-based challenges that limit women's full participation and performance in these enterprises.

Table 4.4: Influence of cultural norms and institutional policies on gender equity within seafood and fruit SMEs

Variables	Women	Men	T-test
Socio-economic			
All gender-specific challenges (3.13)			
unequal access to resources,	16.34	10.74	1.49
gender-based discrimination,	5.92	4.13	0.74
limited decision-making participation	5.63	4.96	0.28
balancing household responsibilities	16.34	10.74	2.66***
All gender-specific advantages (3.14)			
participation in gender-specific programs	41.55	38.56	0.02
access to targeted resources	17.92	12.01	0.3
collaboration with gender equality networks	14.93	10.01	1.06
recognition in markets or programs	49.76	37.19	2.18**
Support from family or community structures	22.45	21.89	0.25
All challenges in accessing or incorporating seafood and fruits in household diets (6.13)	-NA	-NA	-NA
Institutional			
Government policies and regulations (3.15)	40	20	2.1***
Power outages (3.16)	60.23	60.12	0.45
Bureaucratic challenges (3.17)	55.15	30.02	2.01***
Corruption (3.18)	55.67	25.12	2.75***
Cultural norms			
Work discrimination (3.19)	5.92	4.13	0.74
Traditional Festivals and Rituals	7.61	10.74	-1.07
Local Customs and Traditions	7.61	14.05	-2.12**
Community Beliefs and Values	22.82	27.27	-0.99
Cultural Practices Related to Food	16.9	24.79	-1.92***
Cultural factors influencing food choices (6.14)	5.63	9.92	-1.63

Women face a higher burden in balancing household responsibilities (16.34%) compared to men (10.74%), with this difference being statistically significant (t = 2.66, $p < 0.01$). Despite these challenges, women receive more recognition in market programs (49.76%) than men (37.19%), a statistically significant result (t = 2.18, $p < 0.05$). Furthermore, women report greater challenges with government policies and bureaucratic barriers, with 40% of women affected by policy-related obstacles compared to 20% of men (t = 2.1, $p < 0.01$), Bureaucratic challenges (55.15% for women versus 30.02% for men), as evidenced by statistically significant differences (t = 2.01). corruption (55.67% for women versus 25.12% for men), also disproportionately impact women, as evidenced by statistically significant differences (t = 2.75, respectively, $p < 0.01$ for both).

Cultural norms further compound these challenges, with local customs and traditions (14.05% for men versus 7.61% for women, t = -2.12, $p < 0.05$) and food-related cultural practices (24.79% for men versus 16.9% for women, t = -1.92, $p < 0.01$).

4.5: Gender disparities in the influence of fruit and seafood SME performance on household access to food and dietary diversity.

First, we examined the gender disparities in Food security experience scale, Household dietary diversity score and well consumption patterns. The bar chart illustrates the consumption percentages of different food groups, categorized by total sample, males, and females. Cereals have the highest consumption across all groups, with a notably higher percentage for the total sample compared to males and females. Oils/fats also show a significant difference, with higher consumption by females compared to males. Vegetables and fruits are moderately consumed

by both males and females, although females show slightly higher percentages. Conversely, the consumption of eggs, fish/shellfish, and meat/poultry is generally lower across all groups. Interestingly, condiments and sweets reveal a substantial difference in consumption, with females leading in condiment use, while the total sample dominates in sweets. This chart highlights the variations in dietary habits between genders, with certain food groups exhibiting more pronounced gender-based differences.

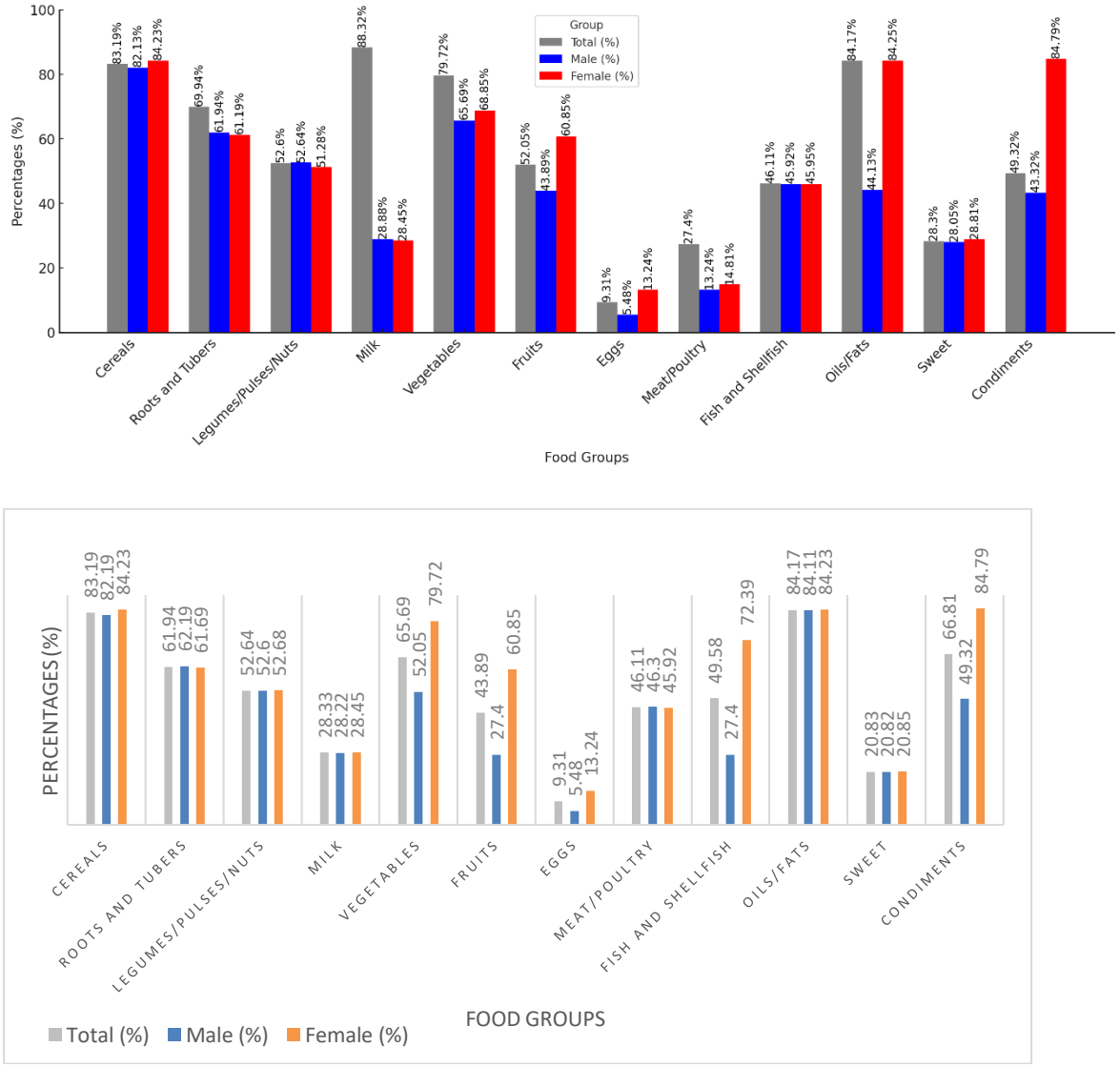

Figure 1: Consumption pattern of Respondents

Figure 2 shows that the Household Dietary Diversity (HDD) classification of respondents, categorized by gender (Female, Male, and Total). A notable majority of both females (62%) and males (58%) fall under the "High" HDD classification, reflecting a well-diversified diet in their households, with the overall total being 60%. In the "Low" category, males constitute the largest proportion (16%), compared to females (5%) and the total group (10%), indicating a gender disparity in dietary diversity at the lower end. The "Medium" category shows a relatively balanced distribution, with 33% of females, 26% of males, and 30% of the total respondents falling into this group. This chart highlights the differences in dietary diversity between genders, with females slightly more represented in the high and moderate categories, while males are more represented in the low HDD category.

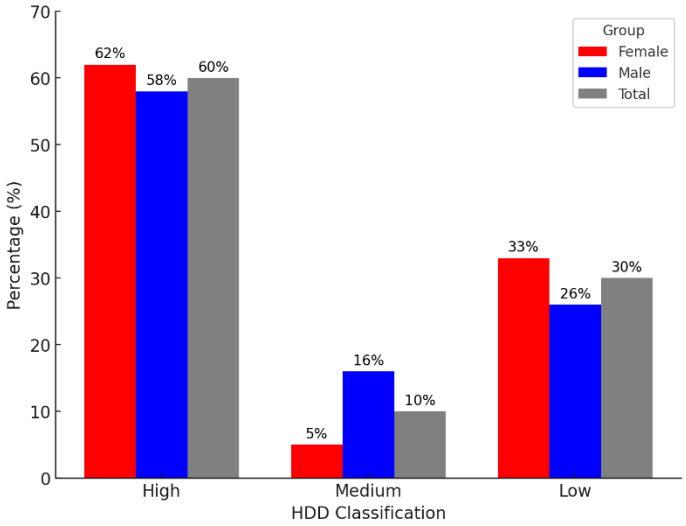

Figure 2: Household Dietary Diversity of Respondents

The chart represents the Household Food Insecurity Experience Scale (FIES) categorized into High, Low, and Moderate levels of food insecurity across male, female, and total respondents. Among those experiencing high food insecurity, females make up 60%, males 50%, and the total stands at 55%. In the low food insecurity category, females constitute 15%, males 20%, with the total at 17%. For moderate food insecurity, 30% of males and 25% of females fall into this category, with the total at 28%.

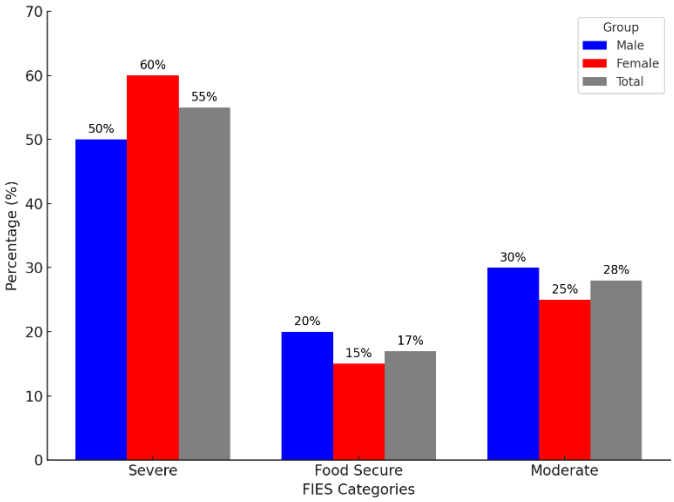

Figure 3: Household Food insecurity Experience Scale of Respondents

The correlation results in Table 4.5 illustrate the influence of performance on Household Dietary Diversity (HDD) and the Food Insecurity Experience Scale (FIES) across the total sample, and separately for male and female respondents. Performance were proxied by (i) Amount Realised from the Seafood and Fruit Sector, (ii) Total Income Including from Other Sources, and (iii) Experience in the Seafood and Fruit Sector.

The results of this study revealed high levels of food insecurity at various degrees among both male (89.37%) and female (91.32%) respondents. This was reflected at the low and moderate food insecurity experience level where the females had lower food insecurity experience than the males (fig. 3).

Table 4.5: Correlation results

	Total Sample		Male		Female	
Variables	**HDD**	**FIES**	**HDD**	**FIES**	**HDD**	**FIES**
Amount Realised from the seafood and Fruit sector	0.015	-0.110***	0.015	-0.110***	0.015	-0.110**
Total income including fom other sources	0.117***	-0.294***	0.117***	-0.294***	0.117***	-0.294***
Experience in the seafood and Fruit sector	0.121***	-0521**	0.112***	-0.521**	0.125***	-0.214***

*The significance levels are represented as follows: *** indicates p-value < 0.01, ** indicates p-value < 0.05, and * indicates p-value < 0.1.*

Total Sample Results

Amount Realized from the Seafood and Fruit Sector: This variable shows a non-significant positive correlation with HDD (0.015) but a statistically significant negative correlation with FIES (-0.110, $p < 0.01$). This indicates that while earnings from the seafood and fruit sectors help reduce food insecurity, they do not have a strong direct influence on dietary diversity for the entire sample. This result aligns with studies indicating that increased income generally enhances food security by improving food access, even if dietary variety does not increase proportionally (Meinzen-Dick et al., 2019).

Total Income Including from Other Sources: Total income, encompassing additional income sources, has a significant positive correlation with HDD (0.117, $p < 0.01$) and a strong negative correlation with FIES (-0.294, $p < 0.01$). These findings suggest that higher total income is associated with greater dietary diversity and reduced food insecurity, a relationship widely supported in food security research. Higher incomes generally enable households to access a broader range of food, thus enhancing both dietary diversity and food security (FAO, IFAD, UNICEF, WFP & WHO, 2019).

Experience in the Seafood and Fruit Sector: Experience in this sector is positively associated with HDD (0.121, $p < 0.01$) and negatively associated with FIES (-0.521, $p < 0.05$), indicating that greater experience contributes to both improved dietary diversity and food security.

Male-Only Results

Amount Realized from the Seafood and Fruit Sector: This variable shows a non-significant positive correlation with HDD (0.015) but a statistically significant negative correlation with FIES (-0.110, $p < 0.01$). This indicates that while earnings from the seafood and fruit sectors help reduce food insecurity, they do not have a strong direct influence on dietary diversity for the entire sample. This result aligns with studies indicating that increased income generally enhances food security by improving food access, even if dietary variety does not increase proportionally (Meinzen-Dick et al., 2019).

Total Income Including from Other Sources: Total income, encompassing additional income sources, has a significant positive correlation with HDD (0.117, $p < 0.01$) and a strong negative correlation with FIES (-0.294, $p < 0.01$). These findings suggest that higher total income is associated with greater dietary diversity and reduced food insecurity, a relationship widely supported in food security research. Higher incomes generally enable households to access a broader range of food, thus enhancing both dietary diversity and food security (FAO, IFAD, UNICEF, WFP & WHO, 2019).

Experience in the Seafood and Fruit Sector: Experience in this sector is positively associated with HDD (0.121, $p < 0.01$) and negatively associated with FIES (-0.521, $p < 0.05$), indicating that greater experience contributes to both improved dietary diversity and food security. This pattern suggests that individuals with more experience may be better positioned to maximize productivity and income, leading to enhanced household food access and variety. This aligns with the findings of Doss and Kieran (2014), who observed that experience in agricultural sectors often enhances income stability and food security outcomes.

Female-Only Results

Amount Realized from the Seafood and Fruit Sector: For females, the Amount Realized shows the same positive correlation with HDD (0.015) and a slightly weaker but still significant negative correlation with FIES (-0.110, $p < 0.05$), implying that women's income from these sectors effectively reduces food insecurity. However, as with men, this income does not significantly affect dietary diversity, which may reflect constraints in how additional income translates into a wider variety of foods (Doss & Kieran, 2014).

Total Income Including from Other Sources: Among women, total income maintains a significant positive correlation with HDD (0.117, $p < 0.01$) and a strong negative correlation with FIES (-0.294, $p < 0.01$). This suggests that income increases among women lead to improvements in both food security and dietary diversity. Literature supports this gendered impact, as women are more likely to direct income toward household food and nutrition needs, positively influencing dietary diversity (FAO, IFAD, UNICEF, WFP & WHO, 2019).

Experience in the Seafood and Fruit Sector: For women, experience in the sector shows a strong positive correlation with HDD (0.125, $p < 0.01$) and a significant negative correlation with FIES (-0.214, $p < 0.01$). This indicates that women with more experience in these sectors not only have greater food security but also promote dietary diversity. This correlation is particularly strong for women, possibly reflecting the tendency for experienced women to use income gains to enhance household nutrition directly (Meinzen-Dick et al., 2019).

Discussions

The findings reflect a gendered economic landscape where disparities in education, income, and resource access influence enterprise performance and household nutrition outcomes. The background literature supports these observations, emphasizing the need for targeted interventions that address structural inequalities and improve women's access to resources to enhance their roles in seafood and fruit enterprises, ultimately impacting household food security and dietary diversity (Johnson et al., 2016; Kilic, Palacios-Lopez & Goldstein, 2015). Gender parity is nearly achieved in this sample (50.6% male and 49.4% female), aligning with the goal of exploring gender-specific barriers and opportunities. This balance is essential in capturing a holistic perspective on the challenges and impacts faced by each gender, as discussed in studies examining gender-based inequalities in small and medium-sized enterprises (Meinzen-Dick et al., 2019; Agarwal, 2018).

This age distribution suggests potential for economic growth and resilience but may also signal vulnerability if younger individuals lack adequate resources and support to scale their enterprises. Kilic, Palacios-Lopez, and Goldstein (2015) note that age, when coupled with gender disparities, can influence economic participation and enterprise growth, especially in culturally restrictive environments where younger women may face additional barriers to entering male-dominated markets. Marital status is often a significant factor in household resource allocation and decision-making power, particularly in cultures where it can enhance

or limit women's economic agency (Meinzen-Dick et al., 2019). Education levels is a promising indicator for enterprise management capacity. However, disparities remain, as men show slightly higher representation in higher education categories, which could translate into unequal access to business opportunities and resources. Studies like those by Doss and Kieran (2014) highlight how educational gaps contribute to performance disparities between men and women in agricultural enterprises. Large households could imply a greater strain on resources, with women often shouldering the burden of managing household nutrition, as documented by Johnson et al. (2016). Households were classified as low-income earner reflecting the economic challenges within this sector. Income disparities are notable as men are more likely to be in the upper-middle income bracket, which may result in better business resources and opportunities, as indicated by Agarwal (2018).

The analysis of gender roles within seafood and fruit SMEs in Nigeria highlights significant disparities in family commitments, decision-making, and productive roles between men and women, reflecting broader gendered dynamics common in agricultural enterprises. This aligns with findings from Huyer et al. (2015), who noted that women in developing economies often face a "double burden" due to their household responsibilities alongside economic activities. Similarly, Johnson et al. (2016) found that women's extensive family commitments can restrict their business growth potential, as they often juggle unpaid domestic work and enterprise responsibilities. Although family responsibilities impact both genders, this study finds that women report a slightly higher and a gender gap of 8.93%, indicating the subjective weight women may feel due to societal expectations of their roles as primary caregivers. Complete control over income by both male and female contrasts with the typical financial dynamics observed in many developing economies, where men predominantly manage household and enterprise finances (Meinzen-Dick et al., 2019). This parity in income control could suggest a unique context within these Nigerian SMEs or indicate shifting norms toward gender equity in financial autonomy within family enterprises. Nevertheless, leadership roles remain highly gendered, with a gender gap of 14.81%. This finding resonates with Agarwal (2018), who identified similar gender disparities in leadership within agrifood value chains, with men frequently occupying positions of authority and decision-making. Such imbalances in leadership roles can limit women's influence over strategic enterprise decisions, potentially affecting enterprise growth and resilience. Women involvement in food purchase decisions is higher than that of men with a gender gap of 27.85%. This high involvement aligns with the findings by Meinzen-Dick et al. (2019), who observed that women's roles in household nutrition are paramount due to their responsibility for meal planning and food purchasing, which can influence household dietary diversity and nutrition. Additionally, the role of women in household food decisions reflects broader societal norms, where food-related tasks are traditionally allocated to women (FAO, IFAD, UNICEF, WFP & WHO, 2019). However, such gendered responsibilities can place an additional burden on women, especially when they are also active in income-generating roles within SMEs. Addressing these disparities requires targeted policies and interventions that enhance women's decision-making power and leadership in SMEs, while also recognizing and mitigating the dual demands they face in balancing enterprise and household roles (Doss & Kieran, 2014; Agarwal, 2018).

The analysis of gender disparities in access to resources, control over resources, and decision-making power within Nigerian seafood and fruit SMEs highlights significant inequalities, underscoring challenges for women in achieving equitable participation and performance in these sectors. The gender gap in access to transportation is 9.8%, women being higher, which is crucial for market access and mobility, both key factors in expanding business opportunities and profitability. This advantage in transportation access may reflect recent efforts to support women's mobility in agricultural markets, but it also underscores that significant gaps remain in other areas of resource access. In terms of benefits from marketing

organizations, women receive fewer benefit than men with a gender gap of 10.43%, suggesting that they may face challenges in accessing market-based support and resources that could enhance their enterprise outcomes. This disparity aligns with findings from Johnson et al. (2016) and Meinzen-Dick et al. (2019), which indicate that women in agricultural sectors often encounter barriers to formal networks and resources crucial for scaling businesses and enhancing competitiveness. Women exceeded men in cooperative membership with a gender gap of 10.32% Cooperative membership is particularly important in agricultural enterprises, as it can offer access to shared resources, collective bargaining, and financial support mechanisms. However, women's participation in capacity-building programs remains low reflecting limited opportunities for skill development. This limitation is consistent with studies by Johnson et al. (2016), who observed that women's access to training and capacity-building often lags behind men's, restricting their ability to improve technical skills and productivity. Additionally, while both genders report high mobile phone ownership, which can facilitate information access and market coordination, women face limitations in benefiting from other forms of support, such as credit access and marketing information. When it comes to decision-making power, gendered disparities persist, particularly in production-related and business decisions. Men dominate broader business decision-making roles, which may influence enterprise direction and access to external resources (Agarwal, 2018). These disparities in decision-making reinforce the challenges women face in moving beyond domestic roles and achieving leadership within SMEs. Overall, these findings highlight how gender disparities in resource access, cooperative support, and decision-making authority impact women's ability to fully leverage their role within seafood and fruit SMEs, thus limiting the potential for women-led enterprises to contribute to household food security and income generation (Meinzen-Dick et al., 2019; Kilic, Palacios-Lopez & Goldstein, 2015). Addressing these disparities will require targeted interventions that enhance women's access to market benefits, capacity-building, and decision-making roles to promote equitable growth and sustainability within these sectors.

Overall, these results underscore the pervasive gender inequalities within the seafood and fruit SME sector in Nigeria, where women shoulder more family-oriented responsibilities and are underrepresented in leadership yet play critical roles in household food security. Balancing household responsibilities as a measure of factors influencing performance of women and men seafood and fruits enterprise thereby creating 5.6% gap burden on women. This reflects the "double burden" women often carry, managing both economic activities and household duties, which can limit their time and resources for business development. Such findings are consistent with Huyer et al. (2015), who noted that women's economic activities are often constrained by cultural expectations around caregiving and household management. Despite these challenges, women receive more recognition in market programs than men, suggesting that gender-specific initiatives might provide some level of support and visibility for women. This means that recognition in the market program is more advantageous for female entrepreneurs than their male counterparts, in other words, female seafood and fruits entrepreneurs have certain characteristics that allow them to take better advantage of market program. The gap in visibility between women and men seafood and fruits is 12.57%. This recognition can enhance women's networks and opportunities within SMEs, yet it may not be sufficient to offset broader structural challenges. Furthermore, the variable government policies and bureaucratic barriers turns out to be more of women than men obstacle to seafood and fruits enterprises, creating 20% gap in the two categories of enterprises.

Bureaucratic challenges create gender gap of 25.13% between men and women fruits and seafood enterprise. Corruption is another variable that was statistically significant between the seafood and fruits enterprises owned by men and women, creating 30.55% gap between gender. These institutional barriers can hinder women's access to resources, stymie business growth,

and limit their ability to compete on equal footing with male counterparts (Meinzen-Dick et al., 2019). Cultural norms further compound these challenges, with local customs and traditions and food-related cultural practices highlighting the gender-specific expectations that shape men's and women's roles in food production and consumption. These norms often dictate women's responsibilities in household nutrition and caregiving, limiting their flexibility to engage fully in income-generating activities (FAO, IFAD, UNICEF, WFP & WHO, 2019). Overall, these findings underscore the need for targeted interventions to address both institutional barriers and socio-cultural norms that restrict women's economic agency. Policies that promote gender-sensitive support structures and challenge discriminatory practices are essential for fostering equitable growth and enabling women to thrive in seafood and fruit SMEs, ultimately enhancing their contributions to household and community food security (Meinzen-Dick et al., 2019; Doss & Kieran, 2014).

More than 80% of the respondents were reported to have consumed cereals within the past 24hours. This finding is not out of place since cereals and their products have become a major staple in Nigeria just like in many other countries. According to Laskowski et al. (2019), cereals are staple foods in most human diets in both developed and developing countries providing a major proportion of dietary energy and nutrients. High consumption of oils and fat was also expected because crude palm oil is an indispensable ingredient in many Nigerian traditional dishes thereby making its consumption a daily practice in most Nigerian homes. Consumption of roots and tubers were 62 and 61% for the males and females respectively. These values were lower than what were reported for some roots and tuber consumption rate in some parts of Nigeria. Enenobong et al (2013), reported that yam and cassava and their products were consumed almost daily by over 70% of the respondents in southern Nigeria. According to Davidson and Eneobong (2019), cassava dishes were consumed by up to 90% of the respondents within the past 24hours in Southeast Nigeria. The decline in the consumption of roots and tubers could be attributed to the worsening effect of nutrition transition. Voster et al (2011) have confirmed the adverse changes in dietary patterns due to nutrition transition in both urban and rural Africans. Subedi et al. (2017) also observed a decrease in roots and tuber consumption (26%) in Nepal due to nutrition transition. Though the rate of consumption of most food groups by the male and female respondents was generally similar, it is interesting to note that the females consumed more nutrient dense foods such as fruits, vegetables, fish and condiments than the males. Similar trend in consumption pattern has been reported by many authors (McClelland, et. Al., (1998) Li et al 2012; Dahal et al 2022). The observed differences could be attributed to weight and health consciousness of women more than men. Dahal et al (2022) observed that health was the most important food choice motive among the females while sensory appeal was the most important food choice motive among the males. A study carried out in Australia by Timperio et al. (2000) revealed that women consume more fruits and vegetables than men and that women have more nutrition knowledge which results in more-healthful eating habit. The study conducted by Li et al. (2012) also showed that females were engaged in in various healthful eating habits including higher consumption of fruits and vegetables compared to men. These findings however contradict that of Madzorera and Wafaie (2020) who noted that women are less likely than men to be able to afford a nutritious diet because women are often in lower paying wage position, earn and control smaller amount of money, have less ability to make decision around household finances or have no income. Njuki et al. (2021) also observed that safe and nutritious food availability and affordability may be out of reach for women who are not empowered or earn enough or have control over money. It is obvious that the female respondents' involvement in fruit and sea food SMEs increased their purchasing power for these nutrients rich foods. Rubust evidence indicate that income under women's control is more likely to be directed to food purchase whereas male control of production revenue has been negatively associated with

dietary quality (Madzorera and Wafaie, 2020). Studies have shown that men more frequently consume meat and meat products more than women (Alkazemi, 2019). This is not in line with the finding of this study where meat consumption rate was similar among the males and females. It could be that high cost of meat and meat product deterred the men from consuming them since very few of the men (4.1%) were at high income level. This implies that when income is limited, men may not necessarily consume more protein food sources than the women rather the reverse may be the case as seen in the fish consumption pattern where the females out-performed the males. The difference in the consumption pattern of condiments among the males and the females could be a case of underreporting on the part of the males since they are not usually involved in food preparation and may not know some of the minor ingredients used. The is also supported by the fact that more than 70% of them were married which means that food preparation was done by their wives. Low consumption of other animal protein sources like milk and egg by both the males and females may also be due to hike in the prices of these commodities which limited their affordability. According to Gupta, (2021), women and households have been spending less on non-staples due to the disproportionate increase in non-staple prices compared to staple food. Eneobong et al (2013) also found low consumption of milk and egg in her studies referring to them as privileged foods due to their high cost.

This shows that women tend to have a higher representation in the high food insecurity category, while men are more represented in moderate and low categories. The overall distribution reflects a more severe food insecurity situation
for women.

The higher representation of the females in the medium and high as well as their low representation at the low classification level of HDD as shown in fig. 2, reveals that their households had more diversified diets than those of the male respondents. It is worthy of note that the females' income had a strong positive association with HDD while the reverse was the case of the males where income negatively correlated with HDD. It can therefore be deduced from the study that the women's' participation in fruit and sea foods SMEs led to their economic empowerment which indirectly reflected in improved dietary diversity of their households. This means that when women have access to and control over income household dietary diversity increases.

This result has revealed that reducing the gender gaps pertaining to economic empowerment can improve household diet quality. This is in line with earlier research (Murugani and Magoshi, 2019; Ruel and Alderman, 2013), who found that improving women's status in terms of resources increases the likelihood of more resources being allocated for food consumption and improves diet diversity. Among other findings, this result highlights gender differences in HDD and points out the importance of considering these differences in efforts towards improving women participation in SMSEs for improved household diets.

The findings underscore how income and experience within these sectors impact dietary diversity and food security, with slight variations by gender. The findings reveal that both income and experience in the seafood and fruit sectors significantly influence food security and dietary diversity, with notable gender differences. While both men and women benefit from increased income and experience, women's income and experience are more directly associated with improvements in dietary diversity. These gendered dynamics suggest that policies supporting women's participation and experience in these sectors could enhance household food security and dietary diversity, as women are more likely to allocate resources toward food-related needs. This aligns with the broader literature indicating that empowering women in agricultural sectors contributes to household nutrition and resilience (Pyburn et al., 2023; Sithole et al., 2023).

These results correspond with what were obtained from several household food security studies carried out in Nigeria and other African countries. In south-east Nigeria, Ukonu, Wallace and Lowe (2023), reported 82.6% while Akinbule, Okekhian and Omidiran (2020), reported food insecurity prevalence of 84.4% in southern Nigeria. Tuholske et al. (2018) and Nour and Abdalla, (2021) reported a value of 70% and 77% in Ghana and Sudan respectively. The relatively higher prevalence of food insecurity observed in this study could be attributed to persistent food inflation in Nigeria. According to Okonkwo, (2020), the cost of food items has increased the most in the first five months of 2024 than it has in the past five years. Among other factors, the persistent food inflation may be attributed to the rising foreign exchange rate. The exchange rate increased from ₦951 per dollar in January 2024 to ₦1421 in May 2024. Another major factor is the rising transportation cost due to oil subsidies removal which drastically increased the transportation cost of agricultural food products. According to Adepou, Ogunniyi and Agbadey (2015), women are regarded as the main contributory factor in household food security.

It is however surprising that the females reported more severe food insecurity experience than the males. It could be that when food insecurity gets severe, some men may tend to under report due to ego since they are, traditionally, the bread winners of the family and may feel ashamed to disclose their incapability in the provision of family foods. Amount of money realised from SMEs and total income had negative association with food insecurity experience by both the males and the females. However, since Ashagidigbi et al. (2022) have noted that women as primary care givers are more food security conscious than men. This means that increasing the income level of the female will reduce household food insecurity more than when men' income are increased. Policy implication of these results suggest that for the enhancement of women income and household food security, improving their participation in SMEs is quite paramount. This pattern suggests that individuals with more experience may be better positioned to maximize productivity and income, leading to enhanced household food access and variety. This aligns with the findings of Doss and Kieran (2014), who observed that experience in agricultural sectors often enhances income stability and food security outcomes.

Conclusion

This study highlights the significant role of gender dynamics in shaping the performance of seafood and fruit SMEs and their subsequent effects on household food security and dietary diversity in Nigeria. Despite women's critical contributions to these sectors, they face entrenched barriers, including limited access to resources, leadership roles, and capacity-building opportunities, compounded by socio-cultural norms and institutional constraints. These disparities undermine the full potential of women's participation in SMEs, limiting their ability to contribute effectively to household and community food security. The findings underscore the centrality of gender-sensitive approaches in addressing these inequities. Women's involvement in SMEs correlates positively with improved household dietary diversity and reduced food insecurity, demonstrating the value of empowering women within these enterprises. Their income and decision-making power were shown to have a more direct impact on household nutrition compared to their male counterparts, reflecting women's prioritization of food-related expenditures. This supports existing literature that advocates for strengthening women's roles in food systems to enhance household welfare and resilience. Despite the positive correlation between women's participation and household nutrition, challenges persist. Bureaucratic and policy-related barriers disproportionately affect women, as evidenced by the significant gender gaps in government support and resource accessibility. Cultural norms further exacerbate these inequities, placing additional burdens on women to balance economic activities with household responsibilities. These challenges highlight the urgent need for policies that promote gender equity through increased access to credit,

capacity-building programs, and institutional support tailored to women's unique needs in SMEs.

The results also reveal broader implications for food security policy in Nigeria. Addressing gender disparities in resource allocation and decision-making can lead to more equitable and sustainable outcomes for households and communities. Interventions that enhance women's leadership in SMEs and reduce socio-cultural and institutional barriers can drive significant improvements in enterprise productivity and household food access. Additionally, recognizing and addressing the structural factors that limit women's participation will be crucial for achieving national food security goals and Sustainable Development Goal 5, which aims to achieve gender equality and empower all women and girls. The study calls for a multi-faceted approach to empower women in seafood and fruit SMEs. This includes implementing gender-sensitive policies, fostering inclusive leadership opportunities, and challenging socio-cultural norms that hinder women's economic participation. By addressing these issues, policymakers and stakeholders can unlock the untapped potential of women entrepreneurs, ultimately contributing to enhanced food security, dietary diversity, and sustainable economic development in Nigeria.

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