



(RESEARCH ARTICLE)



## Analyzing the intersection between food security and poverty status among households

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### Abstract

Food security and poverty among households are intricately linked, each influencing the other in multifaceted ways. Food security, characterized by sufficient, safe, and nutritious food availability, access, utilization, and stability, is fundamental for overall well-being and a human right. In households experiencing food insecurity, chronic hunger and malnutrition are prevalent, impairing productivity and health, perpetuating a cycle of poverty. Conversely, poverty limits households' ability to access diverse, nutritious diets and essential agricultural resources, exacerbated by inadequate infrastructure. This vulnerability to economic shocks and food price fluctuations deepens food insecurity and poverty. Addressing food security is critical for poverty alleviation, as adequate nutrition supports health, productivity, and economic stability. This study aims to project food security and poverty levels among households, proposing measures to mitigate and eliminate these challenges. By examining current statuses and identifying contributing factors, the research seeks to inform targeted interventions enhancing food security and reducing poverty. Methodologies include secondary data analysis from the Central Bank of Nigeria's publications and other authoritative sources, ensuring robust findings to guide policy and practice. The findings confirm significant relationships between poverty, unemployment, and agricultural output in Nigeria, underscoring the interconnected socio-economic dynamics shaping sustainable development. These insights prompt recommendations for governments in the United States and Africa to invest in sustainable agriculture, strengthen social safety nets, promote economic inclusivity, and foster international cooperation to enhance food security and alleviate poverty globally.

**Keywords:** Food security; Poverty; Malnutrition; Agricultural Development; Economic Stability

### 1. Introduction

Food security and poverty status among households are intricately connected, with each influencing the other in multiple ways. Food security, defined as the availability, access, utilization, and stability of sufficient, safe, and nutritious food, is a fundamental human right and a cornerstone of overall well-being. Households experiencing food insecurity often face chronic hunger, malnutrition, and health issues, which can significantly impede their ability to work, learn, and thrive. This creates a vicious cycle where the lack of adequate nutrition undermines individuals' capacity to improve their economic status, thereby perpetuating poverty (FAO, 2006).

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The relationship between food security and poverty is bidirectional. On one hand, poverty restricts households' ability to purchase or produce sufficient food. Low-income families often have limited financial resources to buy a diverse and nutritious diet, and they may lack access to agricultural inputs and technologies that could enhance food production. Additionally, poor households might reside in areas with inadequate infrastructure, such as poor transportation and storage facilities, which further hinders their ability to secure food. Consequently, these households are more vulnerable to food price fluctuations and economic shocks, which can exacerbate their food insecurity and deepen poverty (Wight, et al, 2016).

Conversely, food insecurity can exacerbate poverty by affecting individuals' health, productivity, and economic opportunities. Malnutrition, particularly among children, leads to long-term cognitive and physical impairments, reducing educational attainment and future earning potential. For adults, poor nutrition results in lower productivity and increased susceptibility to illness, which can lead to lost income and higher medical expenses. Furthermore, the stress and anxiety associated with food insecurity can impact mental health, reducing individuals' ability to seek and maintain employment. Therefore, addressing food security is crucial for poverty alleviation, as ensuring access to sufficient and nutritious food can enhance health, improve productivity, and provide a foundation for economic stability and growth among vulnerable households (Siddiqui, 2020).

Addressing food security can significantly reduce poverty status in family households through various mechanisms. Here are five key ways:

- **Improved Health and Reduced Medical Costs:** Ensuring food security provides families with access to nutritious food, which is essential for maintaining good health. A well-nourished population experiences fewer health problems, reducing medical expenses and allowing families to allocate their limited resources to other essential needs, thereby improving their economic stability.
- **Enhanced Educational Outcomes:** Adequate nutrition is critical for cognitive development and academic performance, especially in children. When children have access to nutritious food, they are more likely to perform better in school, leading to higher educational attainment and improved future job prospects. Education is a powerful tool for breaking the cycle of poverty.
- **Increased Productivity and Economic Opportunities:** Proper nutrition boosts physical and mental capacity, leading to increased productivity among working adults. This heightened productivity can translate into better job performance, higher wages, and greater economic opportunities. Well-nourished individuals are also more capable of pursuing and maintaining employment, further reducing poverty levels.
- **Reduced Vulnerability to Economic Shocks:** Food security can help build resilience against economic shocks and crises. When families have reliable access to food, they are less likely to fall into extreme poverty during times of economic instability, natural disasters, or other emergencies. Stable food access acts as a buffer, helping households maintain their standard of living even in challenging times.
- **Empowerment of Women and Marginalized Groups:** Addressing food security often involves initiatives that empower women and marginalized communities, such as supporting small-scale farmers, improving access to agricultural resources, and promoting gender equality in food production and distribution. Empowered women are more likely to invest in their families' well-being, leading to better health, education, and economic outcomes for the entire household. This empowerment can have a ripple effect, fostering community development and reducing overall poverty rates.

Nigeria employs several strategies to assist poor households in combating food insecurity. One crucial initiative is the implementation of social protection programs aimed at vulnerable populations. The government's flagship program, the National Social Safety Net Program (NASSP), encompasses various components such as cash transfers, school feeding programs, and agricultural subsidies. These initiatives aim to enhance household incomes, improve access to nutritious food, and build resilience against economic shocks. For instance, the Conditional Cash Transfer (CCT) component provides regular stipends to poor households, conditional on fulfilling specific health and education requirements, thereby improving their purchasing power for food (Orunbon and Adeleke, 2024).

Additionally, Nigeria prioritizes agricultural development to bolster food production and accessibility. The Agricultural Transformation Agenda (ATA) and the Green Alternative initiative focus on modernizing agricultural practices, enhancing productivity, and supporting smallholder farmers. These efforts include providing improved seeds, fertilizers, and irrigation facilities, as well as promoting agricultural diversification and market access. By investing in agricultural infrastructure and technology, Nigeria aims to boost food production, reduce post-harvest losses, and stabilize food prices, ultimately benefiting poor households reliant on agriculture for livelihoods. These combined efforts underscore Nigeria's commitment to addressing food security challenges among poor households through targeted social interventions and sustainable agricultural development strategies (Asadu, 2015).

The intersection between technological advancements in healthcare and societal well-being becomes evident, much like the intricate relationship between food security and poverty status among households. Just as food security encompasses the availability, access, utilization, and stability of sufficient, safe, and nutritious food, access to advanced medical diagnostics like X-ray imaging is crucial for detecting infections and maintaining health. In impoverished communities, the lack of both nutritious food and adequate healthcare infrastructure creates a vicious cycle of poor health, diminished productivity, and sustained poverty. Malnutrition exacerbates susceptibility to infections, and without proper medical diagnostics, such infections can go undetected and untreated, further hindering individuals' ability to work and thrive. Consequently, ensuring food security and access to advanced medical technologies are both essential components in breaking the cycle of poverty, improving overall health outcomes, and fostering economic stability and growth among vulnerable populations (Irede et al., 2024).

By incorporating ZnO NPs into agricultural practices, it is possible to reduce crop losses due to microbial contamination and UV damage, thereby increasing the yield and quality of produce. Improved crop yield directly addresses food availability and stability, crucial components of food security. Additionally, ZnO NPs can be used in food packaging to extend the shelf life of perishable goods, ensuring that safe and nutritious food remains accessible to households for longer periods. This technological advancement not only helps in maintaining a consistent food supply but also reduces the economic burden on low-income families who often struggle with food preservation (Irede et al., 2024).

### 1.1. Statement of the problem

The research problem focuses on analyzing the intricate relationship between food security and poverty status among households in Igarra, Akoko Edo, Edo State. This region faces significant challenges related to both food security and poverty, with many households struggling to obtain sufficient, safe, and nutritious food necessary for a healthy and active life. Factors contributing to these challenges include low agricultural productivity, limited access to markets and agricultural resources, economic instability, and socio-economic disparities. By investigating how these factors interact and impact food security and poverty levels, the research aims to identify the underlying causes and potential solutions for improving the well-being of households in Igarra. This analysis is crucial for developing targeted interventions and policies that can effectively address food insecurity and alleviate poverty in this community, ultimately fostering sustainable development and improving the quality of life for its residents.

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## 2. Research question

- What is the essence of food security?
- How does household poverty status impact food security?
- How does poverty specifically affect food security in Igarra, Akoko Edo, Edo State?

### *Objective of the study*

The aim of this research is to provide a comprehensive analysis of food security and poverty status among households, focusing on understanding the interplay between these two critical issues. By examining various factors that contribute to food security, such as availability, access, utilization, and stability, the study seeks to identify the underlying causes of food insecurity and its relationship with poverty. Specifically, the research will determine the levels of food security and poverty status among households in Igarra, Akoko Edo, Edo State, assessing how economic constraints, social factors, and environmental conditions influence the ability of households to secure sufficient, safe, and nutritious food. This targeted analysis will offer valuable insights into the unique challenges faced by this community, guiding potential interventions and policy recommendations to enhance food security and reduce poverty.

### 2.1. Significance of the study

The study aims to project the level of food security and poverty among households, with the intention of proposing measures to mitigate and ultimately eliminate food insecurity and poverty within these communities. By assessing the current status and identifying key factors that contribute to these issues, the research will provide a detailed understanding of the challenges faced by households. This will enable the formulation of targeted strategies and interventions designed to enhance food security and reduce poverty, ensuring that households have consistent access to sufficient, safe, and nutritious food. The goal is to create sustainable solutions that address both immediate needs and long-term stability, fostering healthier and more resilient communities.

## 2.2. Statement of hypothesis

- Hypotheses:
  - H0: The poverty level among households in Igarra, Akoko Edo, Edo State is low.
  - H1: The poverty level among households in Igarra, Akoko Edo, Edo State is high.
- Hypotheses:
  - H0: Food security in Igarra, Akoko Edo, Edo State is low.
  - H1: Food security in Igarra, Akoko Edo, Edo State is high.
- Hypotheses:
  - H0: The effect of poverty on food security in Igarra, Akoko Edo, Edo State is low.
  - H1: The effect of poverty on food security in Igarra, Akoko Edo, Edo State is high.

## 2.3. Scope of the study

The research focuses on analyzing food security and poverty status among households in Igarra, Akoko Edo, Edo State. It aims to examine the interrelationship between these factors and explore measures to mitigate food insecurity and poverty within the community.

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## 3. Research methodology

This section of the research outlines the methodologies employed for data collection and analysis, crucial for gaining comprehensive insights into the study's focal points. The selection of appropriate data collection methods is paramount as the accuracy and reliability of findings hinge on the quality of data gathered. This study aims to delve into the current state of employee involvement in decision-making processes, identify underlying reasons for low participation levels, and assess the resultant implications for management decision implementation. Additionally, the research endeavors to propose actionable solutions to mitigate these challenges, thereby enhancing organizational performance.

To achieve these objectives, a mixed-methods approach will be adopted, combining both qualitative and quantitative techniques. Qualitative methods such as semi-structured interviews and focus group discussions will be utilized to explore nuanced aspects of employee perceptions, motivations, and barriers related to decision-making involvement. These methods allow for in-depth exploration of attitudes and experiences among employees, providing rich contextual insights into the dynamics at play within the organization.

Complementing the qualitative approach, quantitative surveys will be employed to gather structured data on the extent of employee involvement in decision-making, perceptions of decision outcomes, and organizational performance indicators. This method enables the collection of numerical data that can be analyzed statistically to identify correlations, trends, and patterns across a larger sample size. By triangulating findings from both qualitative and quantitative data, this study aims to provide a comprehensive understanding of employee involvement in decision-making processes and its impact on organizational effectiveness. Ultimately, the research will offer evidence-based recommendations for enhancing employee engagement in decision-making, thereby fostering a more inclusive and effective organizational culture.

### 3.1. Research design

The study adopts an exploratory research design due to the lack of a clearly defined problem, aiming to identify the optimal research design, data collection methods, and subject selection criteria. This approach is particularly effective for enhancing understanding of the problem through three primary methods: conducting thorough literature research and consulting with experts in the field.

### 3.2. Data collection method

This study employs secondary data obtained from the published annual reports of the commercial bank under investigation. The data collected includes returns on assets and equity computed for the relevant years. The research heavily relies on documentary sources such as textbooks, journals, articles, newspaper articles, and paper presentations. Additionally, it incorporates publications from the Central Bank of Nigeria and other monetary institutions, including CBN bulletins, presentations, slides, and commercial bank bulletins. These sources provide a comprehensive foundation for the analysis conducted in this research.

Model specification

The model for the study comprises of two constructs as described below:

Poverty index (PI)

$$PI = \alpha + \beta_1 AG + \beta_2 EM + e \text{-----} (1)$$

Where

- PI signifies the poverty index
- $\alpha$  is the equation’s constant.
- $\beta_1$  and  $\beta_2$  are the equation constants.
- e Is the error term of the equation

**3.3. Data analysis**

Different analytical tools and software, including pie charts, tables, and Statistical Package for the Social Sciences (SPSS), will be employed to analyze the data in this study. The collected data will undergo analysis using frequencies and percentages. These statistical measures will allow the researcher to accurately depict the characteristics and findings of the data. Furthermore, the interpretation and analysis of data will involve describing the items presented in the tables utilized for this study.

**3.4. Data presentation, analysis and interpretation**

This chapter focuses on presenting, analyzing, and interpreting the data collected during the course of this study. The data utilized in this research is secondary data sourced from the Central Bank of Nigeria's 2012 Statistical Bulletin. The analysis of this data employs regression techniques.

**Table 1** Data Presentation and Analysis

Year	Poverty level (%)	Un-unemployment Level	Agricultural output
1999	58.5	45,922,865	267550.0
2000	60.2	462,010,61	281407.4
2001	69.1	461,127,21	293745.4
2002	69.2	479,653,54	302022.5
2003	68.3	477,653,66	311890.1
2004	72.5	482,649,20	312183.5
2005	70.1	485,049,20	329178.7
2006	71.0	485,449,21	356994.3
2007	71.2	486,662,46	433203.5
2008	72.2	488,244,40	477533.0
2009	74.5	489,310,02	527576.0
2010	74.3	490,210,64	561931.4
2011	75.0	491,110,61	595821.7
2012	76.8	492,002,35	634251.1
2013	70.1	493,107,86	672202.6
2014	78.4	500,566,82	716949.7
2015	78.9	556,597,92	916949.7

Source: Central Bank of Nigeria (2012) statistical Bulletin

## 4. Research hypotheses

### 4.1. Hypothesis 1

- H0 there is no relationship between the poverty level and unemployment level in Nigeria.
- H1 there is a relationship between the poverty level and unemployment level in Nigeria.

Level of significance: 0.05

Decision criterion: The null hypothesis is rejected if the p-value is lower than the chosen level of significance; otherwise, the null hypothesis is accepted.

**Table 2** ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.229	1	4.229	27.200	0.000 <sup>a</sup>
	Residual	2.332	15			
	Total	6.561	16			

a. Predictors: (Constant), unemployment level; b. Dependent Variable: poverty level

#### 4.1.1. Conclusions on the Decision rule based on the ANOVA table above

Given the p-value of 0.000, which is less than the chosen significance level of 0.05, we reject the null hypothesis. Therefore, we conclude that there exists a significant relationship between the poverty level and unemployment level.

**Table 3** Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.803 <sup>a</sup>	0.645	0.621	0.394312963

a. Predictors: (Constant), unemployment level

The multiple correlation coefficient  $R = 0.833$  indicates a strong relationship between unemployment level and poverty level in Nigeria. See table 2 above.

**Table 4** Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-10.022	2.241		-4.471	.000
	Unemployment level	2.398E-7	.000	.803	5.215	.000

a. Dependent Variable: poverty level

#### 4.1.2. Conclusions based on table 3 above

The poverty level is projected to rise by 2.398E-7 with each increment in the unemployment rate. Consequently, it can be inferred that an increase in unemployment does not contribute to reducing poverty levels, which are crucial for enhancing sustainable agricultural output in Nigeria

### 4.2. Hypothesis 2

- H0 poverty level does not have an effect on sustainable agricultural output in Nigeria
- H1 poverty level has an effect on agricultural output in Nigeria

Level of significance: 0.05

Decision rule: reject the null hypothesis if the p-value is less than the level of significance or but accept the null hypothesis if otherwise.

**Table 5 ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.164E11	1	4.164E11	39.147	.000 <sup>a</sup>
	Residual	1.596E11	15	1.064E10		
	Total	5.760E11	16			

a. Predictors: (Constant), poverty level; b. Dependent Variable: AG

**4.2.1. Conclusions on the Decision rule based on the ANOVA table above**

Since the p-value (0.000) is below the significance level of 0.05, we reject the null hypothesis and affirm that the poverty level significantly influences agricultural output in Nigeria. Refer to Table 4 for details.

**Table 6 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.850 <sup>a</sup>	0.723	0.705	103135.6588

a. Predictors: (Constant), poverty level

**Table 7 Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	52635.752	71254.052		0.739	0.471
	poverty level	251919.866	40263.558	0.850	6.257	0.000

a. Dependent Variable: AG

The gross domestic product representing agricultural output would rise by 251919.866 tons with each increment in Nigeria’s poverty level. Higher poverty levels tend to stimulate greater interest in agriculture among people, resulting in increased agricultural output.

**4.3. Hypothesis 3**

- Null Hypothesis (H0): There is no significant effect of poverty level and unemployment level on sustainable agricultural output in Nigeria.
- Alternative Hypothesis (H1): There is a significant effect of poverty level and unemployment level on sustainable agricultural output in Nigeria.
- Level of Significance: 0.05
- Decision Rule: We reject the null hypothesis if the p-value is less than 0.05, indicating a statistically significant effect of poverty and unemployment on agricultural output. Otherwise, we fail to reject the null hypothesis.

**Table 8 ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.696E11	2	2.348E11	30.900	.000 <sup>a</sup>
	Residual	1.064E11	14	7.598E9		
	Total	5.760E11	16			

a. Predictors: (Constant), unemployment level, poverty level; b. Dependent Variable: AG

#### 4.3.1. Conclusions on the Decision rule based on the ANOVA table above

Since the p-value (0.000) is less than the level of significance (0.05), we reject the null hypothesis and conclude that there is an effect of poverty level and unemployment level on sustainable agricultural output in Nigeria. See table 7 above.

**Table 9** Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.903 <sup>a</sup>	0.815	0.789	87168.4505

a. Predictors: (Constant), unemployment level, poverty level

The multiple correlation coefficient  $R = 0.903$  suggests a robust relationship between unemployment level, poverty level, and sustainable agricultural output in Nigeria. Refer to Table 8 for details.

**Table 10** Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.943E6	756825.525		-2.568	0.022
	poverty level	130690.991	57078.512	0.441	2.290	0.038
	unemployment level	0.045	0.017	0.510	2.645	0.019

a. Dependent Variable: AG

The gross domestic product representing agricultural output would rise by 130690.991 units with an increase in Nigeria's poverty level, holding unemployment level constant. Similarly, agricultural output would increase by 0.045 units for each incremental rise in unemployment level. Please refer to Table 9 for more details.

## 5. Results and discussion

The objectives of this study were threefold: firstly, to investigate the impact of poverty on agricultural output in Nigeria; secondly, to analyze the effects of both poverty level and unemployment level on sustainable agricultural output in the country; and thirdly, to explore the existence of any relationship between poverty level and unemployment level.

The findings of the study indicate several significant outcomes. Firstly, there exists a discernible relationship between poverty level and unemployment level across Nigeria. Secondly, the study confirms that poverty level exerts a notable influence on agricultural output within the Nigerian context. Thirdly, it establishes that both poverty level and unemployment level collectively contribute to shaping the sustainability of agricultural output in the country. These findings underscore the interconnected dynamics between socio-economic factors and agricultural productivity, highlighting the critical importance of addressing poverty and unemployment in fostering sustainable agricultural development in Nigeria.

### Recommendations

Governments in the United States and Africa can take several steps to combat household poverty through enhanced food security. Firstly, they should invest in sustainable agricultural practices, supporting smallholder farmers with improved seeds, fertilizers, and modern techniques to boost productivity and resilience to climate change. Second, strengthening social safety nets and food assistance programs is crucial, expanding access to nutritious foods via initiatives like school feeding programs and targeted cash transfers. Third, promoting inclusive economic growth in rural areas through infrastructure and skills development can empower communities in agricultural value chains. Additionally, improving access to education and healthcare services can enhance nutrition awareness and sustainable farming practices. Lastly, fostering international cooperation can facilitate knowledge sharing and technology transfer to ensure sustainable food production and distribution globally. These measures, when implemented comprehensively and with long-term commitment, have the potential to alleviate poverty and enhance food security across both continents. Below are some recommendations;



- **Invest in Agricultural Research and Development:** Allocate resources towards research that improves agricultural productivity, develops drought-resistant crops, and promotes sustainable farming practices.
- **Support Smallholder Farmers:** Provide financial support, access to markets, and training programs for small-scale farmers to increase their productivity and income.
- **Expand Access to Education and Training:** Enhance educational opportunities in agricultural sciences and provide vocational training to equip individuals with the skills needed for modern farming techniques.
- **Strengthen Social Safety Nets:** Implement and expand social safety net programs such as food assistance programs, cash transfers, and school feeding programs to ensure vulnerable households have access to nutritious food.
- **Promote Gender Equality in Agriculture:** Empower women farmers with access to land rights, financial services, and agricultural extension services to enhance their productivity and income.
- **Improve Infrastructure:** Invest in rural infrastructure such as roads, storage facilities, and irrigation systems to reduce post-harvest losses, improve market access, and enhance agricultural productivity.
- **Encourage Sustainable Land Use Practices:** Promote agroecology and sustainable land management practices to conserve natural resources, mitigate climate change impacts, and improve resilience to environmental shocks.
- **Facilitate Access to Finance:** Expand access to credit and financial services tailored to the needs of smallholder farmers and rural entrepreneurs to invest in their businesses and improve productivity (Oshireku, 2023; Onivefu, 2023).
- **Enhance Market Access and Trade:** Support initiatives that facilitate access to local, regional, and international markets for agricultural produce through fair trade agreements and infrastructure development.
- **Foster Policy Coordination and Governance:** Develop and implement coherent policies that integrate food security and poverty reduction objectives across sectors such as agriculture, health, education, and social protection, ensuring effective governance and accountability.

Addressing gender disparities in access to resources and examining urban food security challenges are equally essential to inform comprehensive strategies that promote sustainable development and poverty alleviation worldwide. Below are some suggestions that may work;

- **Impact of Climate Change on Food Security:** Investigate how climate change affects food production, accessibility, and affordability for vulnerable households. Focus on adaptation strategies and resilience-building measures.
- **Nutritional Impact of Food Security Interventions:** Assess the nutritional outcomes of food security programs and interventions on vulnerable populations, particularly children, pregnant women, and the elderly.
- **Gender Dynamics in Agricultural Productivity:** Explore the role of gender in agricultural productivity and food security outcomes. Study how gender-responsive policies and programs can enhance food security and reduce poverty among women farmers.
- **Technological Innovations in Agriculture:** Investigate the adoption and impact of agricultural technologies (e.g., precision farming, biotechnology) on food production, income generation, and poverty reduction in rural communities.
- **Urban Food Security:** Examine food security challenges and interventions in urban areas, including the role of urban agriculture, food markets, and distribution networks in alleviating poverty and improving nutrition.
- **Impact of Food Price Volatility:** Analyze the effects of fluctuating food prices on household food security and poverty levels. Explore policy measures to mitigate the impact of price volatility on vulnerable populations.
- **Social Protection Programs and Food Security:** Evaluate the effectiveness of social safety nets (e.g., cash transfers, food assistance programs) in improving household food security outcomes and reducing poverty rates.
- **Food Systems Resilience:** Study the resilience of food systems to shocks and stresses (e.g., pandemics, conflicts, economic crises) and their implications for poverty dynamics in rural and urban contexts.
- **Role of Indigenous Knowledge in Food Security:** Investigate the contribution of indigenous knowledge systems to sustainable food production, biodiversity conservation, and resilience-building among marginalized communities.
- **Policy and Governance for Food Security:** Analyze the impact of national and international policies, governance structures, and institutional frameworks on achieving food security goals and reducing poverty rates.

By implementing these recommendations, governments can significantly contribute to reducing household poverty through improved food security, ultimately promoting sustainable development and economic growth in their respective regions.

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## 6. Conclusion

As global populations expand and societal landscapes evolve, ongoing research into combating household poverty through food security remains paramount. Future studies should explore innovative strategies such as climate-resilient agriculture to mitigate the impact of climate change on food production. Additionally, investigating the economic empowerment aspects of food security interventions and their impact on income generation and livelihoods could provide valuable insights. Understanding the nutritional outcomes of food security programs, especially for vulnerable groups, and assessing the effectiveness of policy frameworks and technological innovations in enhancing agricultural productivity are also crucial areas for further exploration.

These research areas can provide valuable insights into effective strategies and interventions for combating household poverty through enhanced food security, informing policymakers, practitioners, and researchers in their efforts to achieve sustainable development goals.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

The authors declare that they have no conflicts of interest.

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### *Contributions*

All authors contributed equally to this project.

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