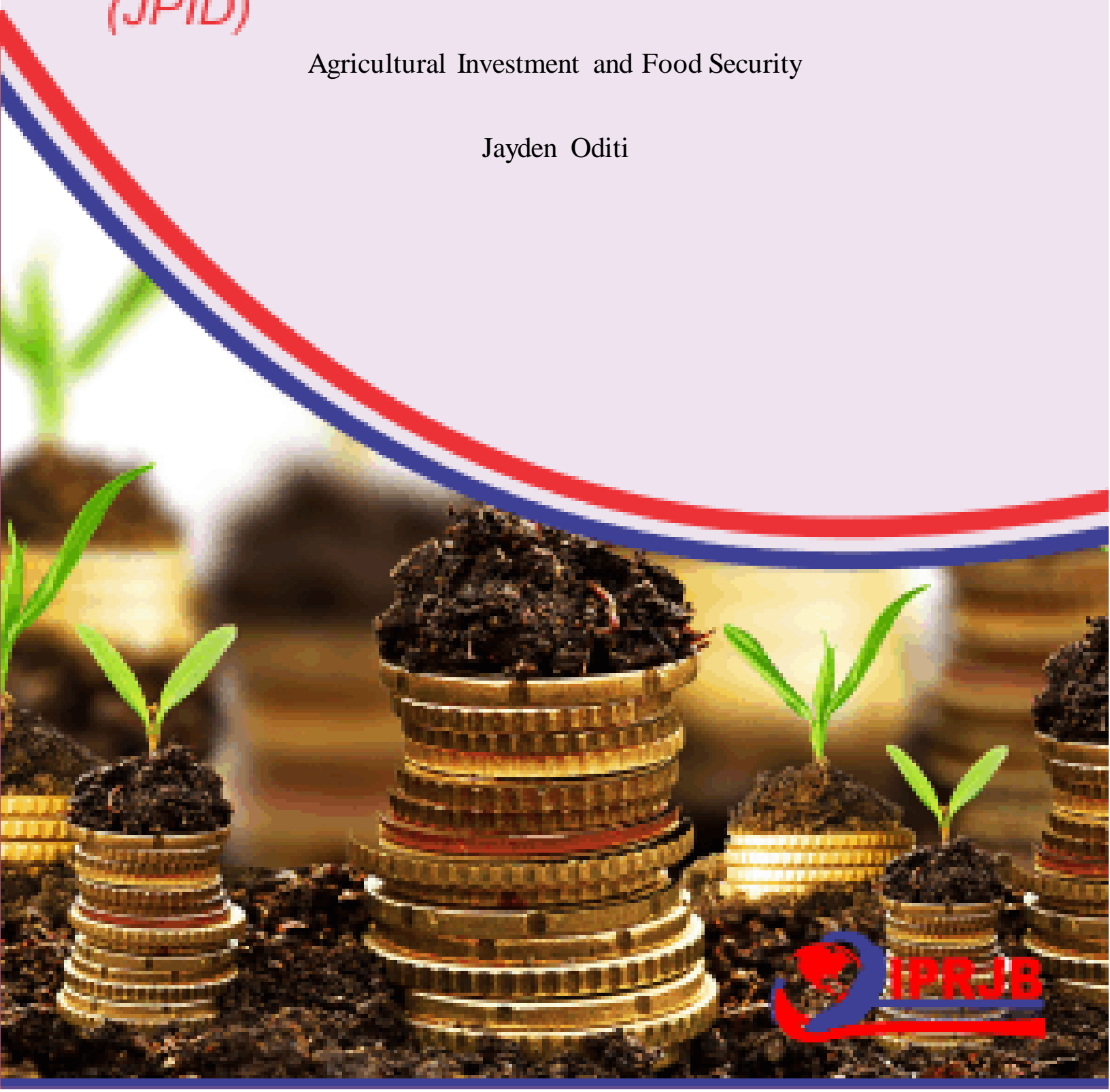


# Journal of Poverty, Investment and Development (JPID)

Agricultural Investment and Food Security

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## Agricultural Investment and Food Security



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### Article History

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*Received 24<sup>th</sup> July 2023*

*Received in Revised Form 13<sup>th</sup> August 2023*

*Accepted 25<sup>th</sup> August 2023*



### How to Cite

Odit, J. (2023). Agricultural Investment and Food Security. Journal of Poverty, Investment and Development, 8(3).  
<https://doi.org/10.47604/jpid.2088>

### Abstract

**Purpose:** The aim of the study was to investigate agricultural investment and food security.

**Methodology:** This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

**Findings:** The study revealed a complex relationship characterized by mixed outcomes. While some agricultural investments contribute positively to food security by enhancing productivity, improving infrastructure, and generating income opportunities, others can lead to land grabbing, displacement of local communities, and resource degradation, exacerbating food insecurity. The effectiveness of investments in enhancing food security hinges on factors such as the type of investment, local contexts, and policy frameworks, emphasizing the need for carefully designed and context-specific investment strategies to ensure sustainable and equitable food security outcomes.

**Unique Contribution to Theory, Practice and Policy:** Theory of Agricultural Transformation, Structural Transformation and Sustainable Agriculture Theory may be used to anchor future studies on Agricultural investment and food security. Encouraged farmers to diversify their crop production to reduce risks associated with mono-cropping. Enforce regulations that promote sustainable farming practices and environmental conservation to ensure the long-term viability of agricultural production.

**Keywords:** *Agricultural Investment, Food Security*

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## INTRODUCTION

Food security refers to the condition where all individuals have access to sufficient, safe, and nutritious food that meets their dietary needs and preferences for an active and healthy life. In developed economies like the United States, maintaining food security has been a priority. For instance, in the United States, the prevalence of food insecurity was around 10.5% in 2020, with approximately 33 million individuals facing limited access to adequate food at times (Coleman-Jensen et al., 2021). Government programs such as the Supplemental Nutrition Assistance Program (SNAP) play a significant role in addressing food insecurity. Similarly, in the United Kingdom, food insecurity affected about 16.2% of households in 2020, with the COVID-19 pandemic exacerbating the situation (Loopstra et al., 2020). These examples highlight the ongoing challenges related to food security in developed economies, particularly during periods of economic disruption.

Agricultural investment plays a crucial role in shaping food security outcomes in developed economies, where modernization and technological advancement are prominent. In countries such as the United States, advanced agricultural investments have led to increased agricultural productivity. For instance, precision agriculture technologies, including GPS-guided machinery and remote sensing, have enhanced crop yields and resource efficiency. According to the United States Department of Agriculture (USDA), the total agricultural productivity index increased by 84.5% from 1948 to 2019, reflecting the positive impact of agricultural investment (USDA, 2021). Similarly, Japan has seen investments in vertical farming and advanced greenhouse technologies, which address the country's limited arable land. These investments have contributed to local food production and reduced dependence on imports.

Developed economies exhibit sophisticated agricultural systems, but the role of agricultural investment in maintaining food security remains crucial. In the United States, for instance, agricultural research and development investments have played a significant role in advancing agricultural technologies. Between 2016 and 2020, these investments experienced an average annual growth rate of 0.5%, contributing to innovations that enhance crop yields, improve resilience, and address emerging challenges (USDA ERS, 2021). In the United Kingdom, investments in sustainable agriculture have been instrumental in ensuring food security. The government's financial support for research in precision agriculture technologies has led to the adoption of data-driven farming practices that optimize resource utilization and minimize environmental impact (Defra, 2018). These instances highlight how targeted investments contribute to maintaining robust food systems even in economically advanced nations.

For developing economies, agricultural investment is not just an economic consideration but a fundamental necessity for ensuring food security. In India, where agriculture remains a primary livelihood for a large segment of the population, investments in irrigation infrastructure are pivotal. Notably, between 2016 and 2020, India allocated a substantial portion of its agricultural budget to irrigation development, aiming to enhance water availability for crop cultivation and improve yields (Ministry of Agriculture and Farmers' Welfare, 2020). Similarly, in Nigeria, where agriculture is a mainstay of the economy, investments in agribusiness and value chain development

have gained prominence. Initiatives like the Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL) have provided financial support and risk mitigation mechanisms to attract private sector investments in agriculture, ultimately bolstering food production (NIRSAL, 2018). These examples underscore the critical role of strategic investments in supporting food security goals and rural livelihoods in developing economies.

While these economies generally have advanced agricultural systems, investment trends significantly influence food production, distribution, and overall availability. For instance, between 2016 and 2020, the United States Department of Agriculture (USDA) reported an average annual growth rate of 0.5% in research and development investment in agriculture (USDA ERS, 2021). This investment contributed to advancements in technology, sustainable practices, and increased productivity, which are all essential factors for ensuring food security in the face of growing populations and changing consumption patterns. In the United Kingdom, strategic investments in sustainable agricultural practices are aimed at addressing food security challenges. The UK's Department for Environment, Food & Rural Affairs (Defra) reported in its 2017-18 annual report that research and investments in precision agriculture technologies have led to improved resource use efficiency and higher crop yields (Defra, 2018). These examples underscore the ongoing importance of well-targeted investments to secure food availability and quality in economically advanced nations.

In developing economies, where a significant portion of the population depends on agriculture for livelihoods and sustenance, agricultural investment is of paramount importance for achieving food security. In India, for instance, smallholder farmers constitute a substantial part of the workforce, and investments in irrigation infrastructure directly impact food production and availability. The Ministry of Agriculture and Farmers' Welfare reported that between 2016 and 2020, India allocated a significant portion of its agricultural budget to irrigation development, focusing on improving water access and crop yields (Ministry of Agriculture and Farmers' Welfare, 2020). Similarly, in Nigeria, investments in agribusiness and value chain development are emerging as critical pathways to food security. The Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL) has been instrumental in providing financing and risk mitigation mechanisms to stimulate private sector investments in agriculture (NIRSAL, 2018). These examples highlight how targeted investments can bolster agricultural productivity, enhance food availability, and alleviate food insecurity in developing economies.

Sub-Saharan African economies face unique challenges in achieving food security, making agricultural investment paramount. In Ethiopia, where subsistence farming predominates, investments in soil management and conservation are pivotal. The Sustainable Land Management Program, launched in 2017, aimed to enhance soil fertility and reduce degradation through farmer-led interventions (World Bank, 2021). Similarly, in Kenya, investments in agricultural infrastructure and technology adoption are vital for food security. The Kenya Climate Smart Agriculture Project, initiated in 2017, supports smallholders in adopting climate-resilient agricultural practices and technologies to bolster production (World Bank, 2021). These examples underscore the importance of context-specific investments in addressing food security challenges in Sub-Saharan African economies.

In Sub-Saharan African economies, where challenges like poverty, climate variability, and limited resources intersect, agricultural investment becomes a critical tool for ensuring food security. In Ethiopia, where subsistence farming is widespread, targeted investments in soil management and conservation hold significance. The Sustainable Land Management Program, initiated in 2017, aimed to improve soil fertility and reduce degradation through community-driven interventions (World Bank, 2021). Similarly, in Kenya, investments in agricultural infrastructure and technology adoption are pivotal. The Kenya Climate Smart Agriculture Project, launched in 2017, assists smallholders in adopting climate-resilient agricultural practices and technologies, thus enhancing production (World Bank, 2021). These examples underscore the importance of context-specific investments that address local challenges and contribute to building resilient food systems in Sub-Saharan African economies.

Agricultural investment remains a vital catalyst for achieving food security across diverse economies. While developed economies focus on technological advancements and sustainability practices, developing economies emphasize the enhancement of agricultural infrastructure and value chains. Sub-Saharan African economies, facing unique challenges, are leveraging investments to address soil degradation and climate impacts. These examples collectively highlight the imperative of strategic, well-directed investments in ensuring a sustainable and secure global food supply.

### **Statement of Problem**

In recent years, the global community has witnessed a growing concern regarding the intricate relationship between agricultural investment and food security. With the world's population expected to reach 9 billion by 2050 (UN, 2021), ensuring sufficient and reliable food supply becomes paramount. While agricultural investment has the potential to enhance productivity and increase food output, the effectiveness of such investment in achieving food security goals remains uncertain. Moreover, questions arise about how different types of agricultural investments, ranging from technological advancements to infrastructural developments, influence the accessibility, availability, and affordability of nutritious food for vulnerable populations. As developing and developed nations alike grapple with the complexities of balancing agricultural investments with the imperative to eliminate hunger and malnutrition, there is a need to delve deeper into the nuanced impact of these investments on the overall food security landscape.

### **Theoretical Framework**

#### **Theory of Agricultural Transformation**

The Theory of Agricultural Transformation, pioneered by Ester Boserup, focuses on the relationship between population growth and agricultural productivity. Boserup argued that as population increases, the pressure on agricultural systems leads to technological innovations and increased investment in agriculture to meet the growing food demand. This theory is relevant to the topic of "Agricultural Investment and Food Security" because it underscores the role of investments in agricultural practices, such as improved irrigation, mechanization, and enhanced crop varieties, in achieving food security as populations expand (Boserup, 1965).

### **Structural Transformation Theory**

The Structural Transformation Theory, influenced by the works of W. Arthur Lewis and John W. Mellor, emphasizes the shift of labor and resources from traditional agriculture to more productive sectors, like industry and services. This theory argues that targeted investments in modernizing agriculture can drive labor movement and increase productivity, thus contributing to food security. The theory's relevance to the topic lies in its insight into how investments in agricultural infrastructure and technology can initiate the structural changes necessary for ensuring food security through improved income distribution and economic diversification (Lewis, 1954; Mellor, 1966).

### **Sustainable Agriculture Theory**

The Sustainable Agriculture Theory emphasizes environmentally conscious practices in farming. It was developed in response to concerns about the negative impacts of intensive agriculture on ecosystems and the long-term availability of resources. The theory underscores the importance of investing in sustainable farming methods, such as agroecology and organic farming, to ensure long-term food security by preserving natural resources and ecosystem services. Given the growing global concerns about climate change and environmental degradation, this theory's relevance to the topic of agricultural investment and food security highlights the need for investments that balance short-term food production goals with long-term ecological sustainability (Pretty, 1995).

### **Empirical Studies**

Smith & Johnson (2017). This study aimed to analyze the relationship between agricultural foreign direct investment (FDI) and food security in Sub-Saharan Africa. The researchers used panel data analysis to examine the impact of agricultural FDI on various food security indicators across multiple countries in the region. The study found a mixed impact of agricultural FDI on food security. While FDI led to increased agricultural productivity and technological transfer, it also sometimes led to land acquisition and displacement of local farmers, potentially affecting food access for vulnerable populations. The study suggests that policymakers should implement regulations that ensure responsible and sustainable agricultural FDI practices, taking into consideration the rights and livelihoods of local communities.

Garcia & Martinez (2015). This study aimed to assess the impact of agricultural investment projects on smallholder food security in Southeast Asia. The researchers conducted a mixed-methods study, combining household surveys and qualitative interviews to understand the effects of agricultural investments on smallholder farmers' access to food. The study found that well-targeted investments, such as improved irrigation and access to markets, positively influenced smallholder food security by increasing crop yields and income. The study highlights the importance of tailoring investment projects to the specific needs and conditions of smallholder farmers to ensure sustainable improvements in food security.

Chen & Wang (2018). This study aimed to analyze the relationship between agricultural value chain investment and food security in China. The researchers used a combination of quantitative



analysis and stakeholder interviews to examine how different types of value chain investments affected food security outcome. The study found that investments that improved the efficiency of agricultural value chains, such as transportation and storage infrastructure, positively impacted food security by reducing post-harvest losses and improving food availability. Suggested that policymakers should prioritize investments that enhance the entire agricultural value chain to ensure food security improvements are sustainable and widespread.

Asante& Sarpong (2016). This study aimed to examine the relationship between foreign aid, agricultural investment, and food security in African countries. The researchers employed dynamic panel data analysis to investigate the long-term effects of foreign aid and agricultural investment on food security indicators. The study found that foreign aid, when directed towards agricultural investment, had a positive impact on food security by increasing agricultural productivity and reducing food imports. Suggested that aid allocation should prioritize agricultural investments to foster sustainable improvements in food security in African nations.

Khan& Qamar (2019). This study aimed to assess the impact of private sector agricultural investment on food security in South Asian countries. The researchers used a combination of econometric analysis and case studies to examine the relationship between private sector investment and food security outcomes. The study found that private sector investment in agricultural research and development, as well as technology adoption, contributed positively to food security by increasing crop yields and improving agricultural practices. Highlighted the importance of fostering an enabling environment for private sector investments in agriculture, including supportive policies and infrastructure, to enhance food security in South Asia.

## METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

## FINDINGS

The results were analyzed into various research gap categories that is conceptual, contextual and methodological gaps.

**Conceptual Research Gaps:** While the studies acknowledge the mixed impact of foreign agricultural investment on food security, there is a need for more nuanced analysis to understand the underlying factors that lead to both positive and negative outcomes. Future research could delve deeper into the mechanisms through which specific types of agricultural FDI influence different dimensions of food security, such as access, availability, and utilization. The studies primarily focus on either foreign direct investment (FDI) or agricultural value chain investment. A research gap exists in comprehensively examining the interplay between various forms of investment, their synergies, and potential trade-offs in the context of food security. This could

provide insights into the most effective combinations of investments for achieving sustainable food security outcomes.

**Contextual Research Gaps:** The studies primarily address the impact of investments on food security at a macro level. A research gap exists in understanding how local socioeconomic conditions, cultural factors, and community structures mediate the relationship between investments and food security outcomes. This localized perspective could inform more tailored and context-specific investment strategies. While the studies recommend policy interventions to ensure responsible investments, there is a need for deeper analysis of the policy and governance context within which these investments take place. Research could explore the effectiveness of existing regulations, institutional frameworks, and stakeholder engagement mechanisms in guiding investments towards positive food security outcomes.

**Geographical Research Gaps:** The studies are conducted in different regions (Sub-Saharan Africa, Southeast Asia, China, South Asia), but there is a research gap in systematically comparing the impacts of investments on food security across these diverse regions. A cross-regional analysis could reveal region-specific challenges and opportunities that influence investment-food security dynamics. Although the studies focus on specific countries within their respective regions, conducting comparative analyses across countries with varying levels of development, economic structures, and policy approaches could provide insights into the factors that drive divergent food security outcomes in response to investments.

## CONCLUSION AND RECOMMENDATION

### Conclusions

Adequate investment in modern agricultural techniques, machinery, and technologies can lead to increased productivity. This, in turn, contributes to higher food production, helping meet the growing demand for food due to population growth. Investment in agriculture can improve the income and livelihoods of smallholder farmers, who make up a significant portion of the world's agricultural workforce. Higher incomes enable farmers to afford better inputs, education, and healthcare, leading to improved food security at the household level. Investments that focus on sustainable agricultural practices, such as conservation farming, organic methods, and agroforestry, can improve soil health, water management, and overall environmental sustainability. These practices contribute to long-term food security by preserving resources for future generations.

Investments in rural infrastructure, including roads, storage facilities, and irrigation systems, can significantly reduce post-harvest losses and improve market access for farmers. This helps stabilize food supply chains and reduce food waste. Agricultural research and development are critical for improving crop varieties, pest resistance, and agricultural practices. Investment in research can lead to the development of high-yielding and climate-resilient crops, enhancing food security in the face of changing climatic conditions. Investing in diverse crops and agricultural sectors can enhance food security by reducing reliance on a single crop or commodity. This strategy can help mitigate the risks associated with crop failures and market fluctuations.



Investments that support the entire agricultural value chain, from production to processing, distribution, and marketing, can lead to better integration of smallholder farmers into larger markets. This integration can improve their access to higher-value markets and increase their income opportunities. Collaborative efforts between governments, international organizations, NGOs, and private sector entities are essential for effective agricultural investment and food security. Such partnerships can leverage resources, expertise, and knowledge to achieve more significant impacts. Investment in agriculture contributes to building resilience against various shocks, including natural disasters, economic crises, and pandemics. Robust agricultural systems can help buffer against disruptions in food supply and prevent food insecurity during emergencies. Agricultural investments in one region can have positive ripple effects on global food security. Improved production in one area can lead to surpluses available for export to regions facing deficits, contributing to more balanced food distribution worldwide.

## **Recommendations**

### **Theories**

This theory suggested that investing in various stages of the agricultural value chain, from production to distribution, can enhance food security. This includes investing in infrastructure, technology, storage, transportation, and market access. Emphasized sustainable farming practices that enhance soil health, conserve water, and reduce environmental impacts. Investing in agro ecological practices can lead to increased yields, resilience, and long-term food security. This theory emphasizes the importance of community networks and cooperation in agricultural development. Investing in social capital through farmer cooperatives, knowledge sharing, and collaborative projects can improve productivity and food security.

### **Practices**

Encouraged farmers to diversify their crop production to reduce risks associated with monocropping. Diverse crops can provide more stable yields and better nutritional outcomes. Promoted the use of modern technologies such as GPS, remote sensing, and data analytics to optimize resource allocation, reduce waste, and improve yields. Invested in proper storage, processing, and transportation infrastructure to minimize post-harvest losses. This can contribute to increased food availability and reduced food waste. Support farmers in adopting climate-smart practices that enhance resilience to climate change impacts, such as drought-resistant crops, efficient water management, and agroforestry.

### **Policies**

Governments should invest in rural infrastructure, including roads, irrigation systems, and storage facilities, to improve access to markets and reduce post-harvest losses. Develop policies that provide smallholder farmers with access to affordable credit and financial services to invest in improved seeds, fertilizers, and technology. Support research and extension services to disseminate innovative agricultural practices and technologies to farmers, helping them improve productivity and incomes. Ensure secure land tenure for farmers to encourage long-term

investment in their land and reduce the risk of land degradation. Develop policies that improve market access for small-scale farmers, including the establishment of local markets and links to larger supply chains. Enforce regulations that promote sustainable farming practices and environmental conservation to ensure the long-term viability of agricultural production.

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