



# The Role of Rice Production as a Key Factor in Enhancing Cambodian Agriculture: A Systematic Review

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**Abstract.** *Rice production is central to Cambodia's agriculture, contributing to economic development, poverty alleviation, food security, and sustainable farming practices. This systematic review aims to analyze the multifaceted role of rice production in enhancing Cambodian agriculture. The review draws on studies related to agricultural productivity, economic impacts, rural development, and government policy frameworks, providing an integrated perspective on how rice production drives Cambodia's agricultural progress. By understanding the multifaceted role of rice cultivation, policymakers and stakeholders can develop effective strategies to further promote agricultural progress and improve the livelihoods of Cambodian farmers.*

**Keywords:** *Cambodia's agriculture, Economic impact, Food security, Rice production*

## INTRODUCTION

Rice production stands as a cornerstone of Cambodian agriculture, exerting a profound influence on the nation's economic development, poverty alleviation, food security, and sustainable farming practices (World Bank, 2021). This systematic review delves into the multifaceted role of rice cultivation in shaping Cambodia's agricultural landscape. By examining studies pertaining to agricultural productivity, economic impacts, rural development, and government policy frameworks, this review offers a comprehensive understanding of how rice production serves as a catalyst for Cambodia's agricultural progress. Rice production plays a pivotal role in boosting agricultural productivity, driving economic growth, and improving livelihoods (Sophal, 2017). Through advancements in agricultural technology, such as improved seed varieties, fertilizer management, and irrigation systems, Cambodia has achieved significant gains in rice yields. This increased productivity has not only enhanced farmers' incomes but has also contributed to the nation's export earnings, diversifying the economy and reducing reliance on foreign aid. Rice production has a far-reaching impact on Cambodia's

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economy, extending beyond agriculture. The rice value chain, encompassing production, processing, distribution, and consumption, generates employment opportunities and supports related industries, such as fertilizer manufacturing, machinery production, and transportation. Moreover, the rice sector contributes to the development of rural infrastructure, such as roads, schools, and healthcare facilities, improving the quality of life for rural communities (Smith & Chan, 2019).

Rice production is a key driver of rural development in Cambodia. By providing a stable source of income for millions of smallholder farmers, rice cultivation has helped to reduce poverty and improve living standards in rural areas. Additionally, rice production has fostered the development of rural cooperatives and farmer organizations, empowering farmers to negotiate better prices for their crops and access essential services. Government policies play a crucial role in supporting rice production and promoting agricultural development in Cambodia. The government has implemented various initiatives, such as agricultural extension services, credit programs, and market infrastructure development, to enhance the competitiveness and sustainability of the rice sector. These policies have been instrumental in enabling Cambodian farmers to adapt to changing market conditions and climate challenges (Pech, 2019).

This systematic review aims to analyze the multifaceted role of rice production in enhancing Cambodian agriculture.

## **METHODS**

This comprehensive systematic review meticulously gathered a diverse range of scholarly literature, including research articles, government reports, and data from reputable international organizations. These sources were published within a decade, spanning from 2010 to 2023. To ensure a thorough and unbiased analysis, the selection process relied on reputable databases such as Scopus, Google Scholar, and PubMed. After a rigorous evaluation, a total of 56 studies were chosen for their relevance and quality, focusing on four critical areas: economic growth, poverty alleviation, food security, and sustainable agricultural practices.

## **RESULTS AND DISCUSSION**

### **Economic impact of rice production**

Rice, a staple food in Cambodia, plays a pivotal role in shaping the country's economy. As the primary agricultural export and a key component of domestic consumption, rice production has a profound impact on various sectors, driving economic growth, poverty reduction, and rural development (Mekong Institute, 2019).

**Agricultural Dominance and Economic Growth:** Rice cultivation occupies a significant portion of Cambodia's agricultural land, making it the dominant crop in the country. The sector's contribution to the overall economy is substantial, providing employment opportunities for millions of people, particularly in rural areas. Increased rice production has led to higher agricultural incomes, which in turn have stimulated economic growth and spurred investment in related industries such as processing, transportation, and distribution (World Bank, 2021).

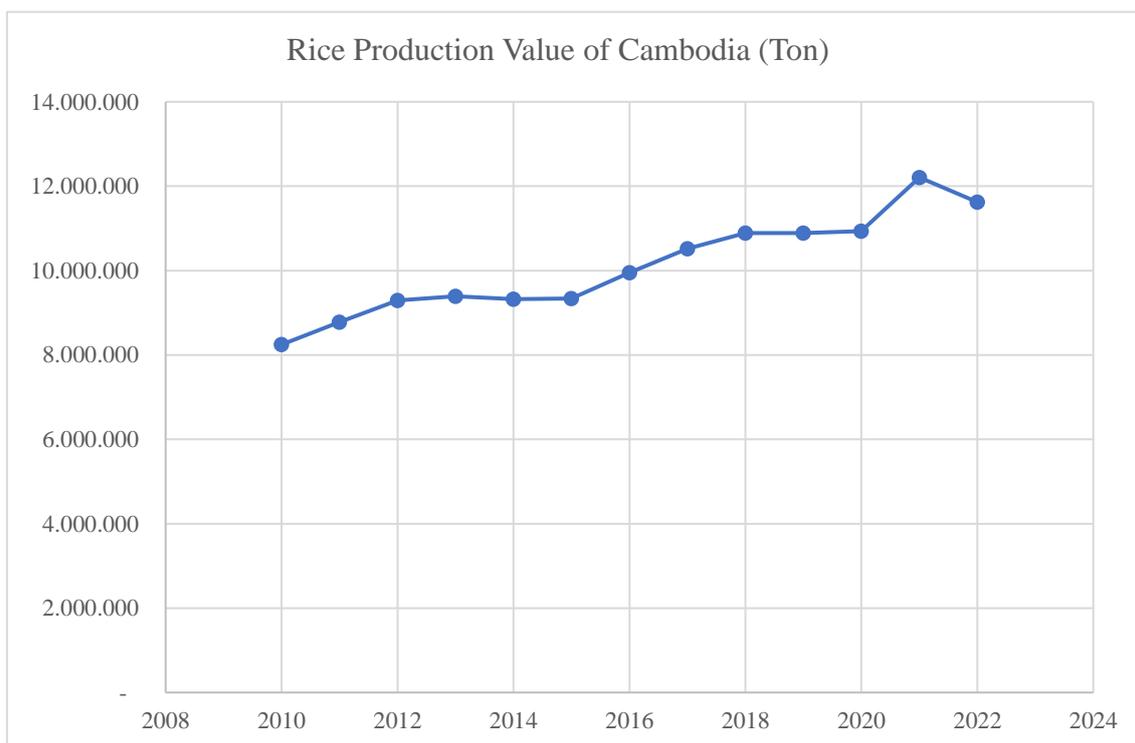
**Poverty Alleviation and Rural Development:** Rice production has been instrumental in alleviating poverty in Cambodia, especially in rural areas. Smallholder farmers, who constitute a significant portion of the population, rely heavily on rice cultivation for their livelihoods. Increased rice yields and higher market prices have enabled farmers to earn more income, lifting them out of poverty and improving their living standards. Furthermore, the rice sector has driven rural development by creating demand for infrastructure, such as roads, irrigation systems, and storage facilities, which benefit not only farmers but also the broader rural population.

**Export Potential and Foreign Exchange Earnings:** Cambodia's rice exports have grown steadily in recent years, contributing significantly to the country's foreign exchange earnings. The demand for Cambodian rice in international markets has been driven by its high quality and competitive prices. Exports have helped to diversify Cambodia's economy and reduce its dependence on foreign aid.

**Challenges and Opportunities:** Despite its economic importance, the rice sector in Cambodia faces several challenges, including climate change, soil degradation, and competition from other rice-producing countries. However, there are also opportunities for growth and development. The government has implemented various policies and

programs to support the rice sector, such as providing agricultural extension services, improving infrastructure, and promoting sustainable farming practices. By addressing these challenges and capitalizing on the opportunities, Cambodia can further strengthen its position as a leading rice exporter and enhance its economic development.

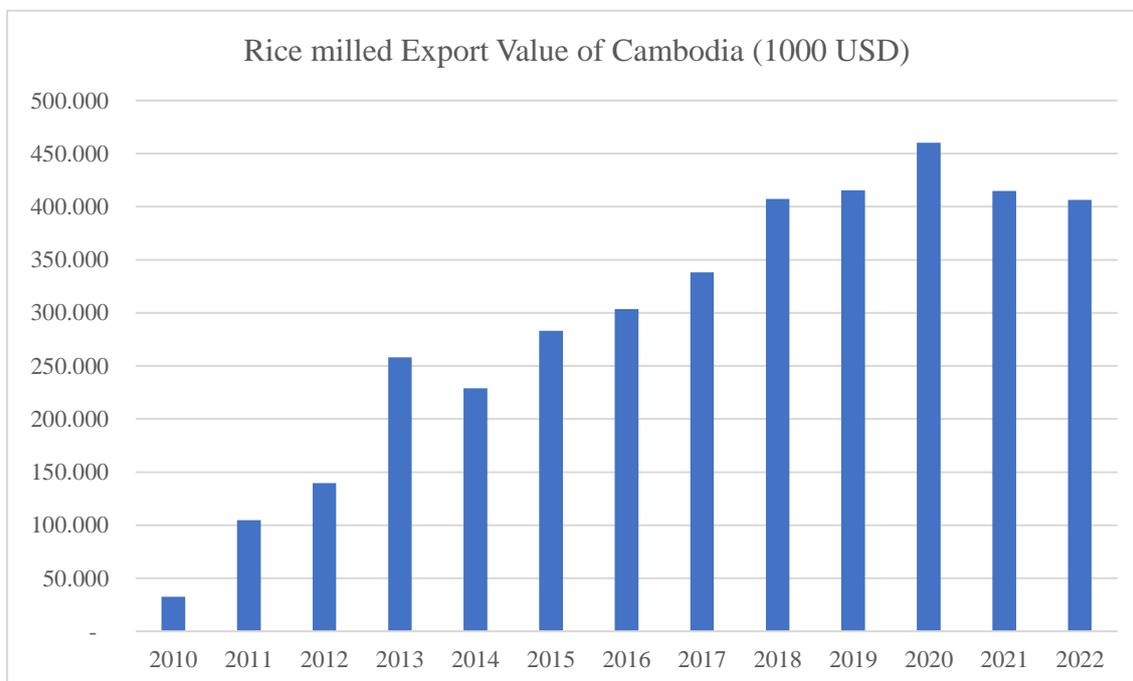
Rice production has played a substantial role in bolstering Cambodia's Gross Domestic Product (GDP). A pivotal turning point came in 2010 when the Royal Government of Cambodia introduced the Rice Export Policy. This policy acted as a catalyst, significantly boosting rice exports and contributing to a surge in foreign exchange earnings. Moreover, it fostered rural development by creating new economic opportunities for farmers and rural communities (Phan et al., 2020). To illustrate the impact, rice exports soared from 50,000 metric tons in 2010 to an impressive 600,000 metric tons by 2020 (Miller & Sok, 2020). The government's strategic investment in infrastructure and rural roads further improved the distribution of rice, benefiting both local farmers and the broader economy (World Bank, 2021).



**Figure 1: Rice production value of Cambodia 2010-2022 (FAOSTAT Database)**

The export value of milled rice from Cambodia has consistently increased over the past decade, reflecting a growing demand for Cambodian rice in international markets.

The export value has nearly quintupled from 2010 to 2022, indicating a significant expansion of the rice export sector. The upward trend suggests that Cambodia's rice industry is poised for further growth and development in the coming years.



**Figure 2: Rice milled export value of Cambodia 2010-2022 (FAOSTAT Database)**

### **Poverty reduction through rice farming**

Rice farming is critical for the livelihoods of smallholder farmers, who constitute the majority of Cambodia's rural population. Studies suggest that increases in rice productivity are directly associated with reductions in rural poverty (Chan & Rith, 2019). The FAO (2020) links improvements in rice yields, particularly through the adoption of high-yield varieties and advanced agricultural techniques, to income increases of 20–30% for farming households. These productivity gains have had a substantial impact on reducing rural poverty levels, especially in provinces where rice farming dominates (Johnson et al., 2018).

### **Food security**

Cambodia has achieved near self-sufficiency in rice, with annual production consistently exceeding national consumption needs since 2015 (Pech, 2019). This has led

to significant improvements in food security, ensuring a stable food supply and lowering the risk of hunger in rural areas (Kimsan, 2016). The Food and Agriculture Organization (FAO, 2020) reported that Cambodia's efforts to increase rice productivity have enabled the country to feed its growing population while exporting surpluses to global markets.

### **Sustainable rice farming practices**

Sustainability is a growing concern in Cambodia's agricultural sector, particularly in rice farming, which relies heavily on water and fertile soils. Since 2010, an increasing number of farmers have adopted the System of Rice Intensification (SRI), which promotes higher yields with reduced water usage and fewer inputs (Uphoff, 2014). The use of eco-friendly practices like integrated pest management (IPM) has also contributed to reduced pesticide use, improving environmental outcomes (Yun & Sokha, 2018).

## **DISCUSSION**

### **Economic Growth and Global Competitiveness**

The integration of Cambodian rice into global markets has played a significant role in enhancing the national economy. The "Rice Export Policy" of 2010 (Royal Government of Cambodia, 2010) set a target of exporting 1 million tons annually, which pushed farmers and stakeholders to invest in modern farming techniques and improve post-harvest processes (Kunthy & Cramb, 2019). Cambodia's ability to export high-quality fragrant rice has earned it a place in competitive international markets, alongside other major rice exporters like Thailand and Vietnam (Phan et al., 2020).

### **Infrastructure and market access challenges**

Despite these successes, Cambodia's rice sector faces infrastructure challenges, particularly in terms of inadequate irrigation systems and road networks in rural areas (ADB, 2019). Limited access to modern agricultural technologies and financing options for smallholder farmers further hinders productivity growth (Phan et al., 2020). To unlock the sector's full potential, there is a need for significant investment in rural infrastructure and market linkage development (Smith & Chan, 2019).

## **Addressing climate vulnerability**

Rice farming in Cambodia is increasingly vulnerable to climate change, particularly due to the country's reliance on rain-fed agriculture. Droughts and floods have become more frequent, affecting yields and threatening food security (Heng et al., 2019). Building climate resilience through better irrigation, water management, and climate-smart agriculture is critical to sustaining rice production in the future (Sok et al., 2018).

## **CONCLUSION AND RECOMMENDATION**

Rice production plays an indispensable role in Cambodia's agricultural sector, driving economic growth, poverty reduction, and food security while contributing to environmental sustainability. However, addressing the challenges posed by climate change, infrastructure deficiencies, and market access is vital to realizing the full potential of rice farming in Cambodia. Continuous government support, international cooperation, and investments in sustainable practices will be crucial for the long-term success of Cambodia's rice sector.

Based on the findings of this research, the following recommendations are offered to enhance the contribution of rice production to Cambodia's agricultural sector:

1. **Climate Change Mitigation and Adaptation:** Implement strategies to mitigate the impacts of climate change on rice production, such as promoting climate-resilient rice varieties, improving water management practices, and investing in climate-smart agriculture technologies.
2. **Infrastructure Development:** Invest in infrastructure improvements, including irrigation systems, storage facilities, and transportation networks, to enhance the efficiency and competitiveness of the rice value chain.
3. **Market Access and Diversification:** Facilitate access to domestic and international markets for Cambodian rice, explore new export markets, and promote value-added rice products to increase revenue and reduce price volatility.
4. **Sustainable Farming Practices:** Encourage the adoption of sustainable farming practices, such as organic farming, integrated pest management, and agroforestry, to protect the environment and improve soil health.

5. **Government Support and Policy Reforms:** Provide ongoing government support to the rice sector through targeted policies, subsidies, and extension services. Review and update existing policies to ensure they align with the evolving needs of the sector and promote sustainable development.
6. **International Cooperation:** Strengthen international cooperation to facilitate knowledge exchange, technology transfer, and market access for Cambodian rice. Engage with regional and global organizations to address common challenges and opportunities in the rice sector.
7. **Research and Development:** Invest in research and development to improve rice varieties, develop new agricultural technologies, and enhance understanding of the sector's challenges and opportunities.

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