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PROMOTING THE SUSTAINABLE DEVELOPMENT OF VIETNAM'S AGRICULTURE

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ABSTRACT

Vietnam's agriculture plays a pivotal role in ensuring food security, supporting rural livelihoods and contributing significantly to national economic growth. However, the sector is facing increasing challenges from climate change, resource depletion, environmental degradation and market volatility. Promoting sustainable agricultural development is therefore essential to balance economic efficiency with environmental protection and social equity. This paper discusses the key drivers, opportunities and obstacles to advancing sustainable agriculture in Vietnam. It emphasizes the importance of applying modern technology, enhancing value chains, promoting green production models and strengthening institutional frameworks. The study also proposes policy recommendations and strategic solutions to foster innovation, improve competitiveness and ensure long-term resilience of Vietnam's agricultural sector.

Keyword: Vietnam's agriculture; sustainable development; food security; value chain; climate change adaptation

1. INTRODUCTION

Agriculture has long been the backbone of Vietnam's economy, not only ensuring national food security but also providing livelihoods for a majority of the rural population. Over the past decades, Vietnam has achieved remarkable progress in agricultural production, shifting from a food-deficit country to one of the world's leading exporters of rice, coffee, pepper and aquatic products. These achievements have contributed substantially to poverty reduction, social stability and overall economic growth. However, the rapid expansion of agricultural output has also created new challenges. Intensive farming practices have led to soil degradation, water pollution and biodiversity loss. Meanwhile, climate change with its manifestations of rising temperatures, salinity intrusion and unpredictable natural disasters, poses serious threats to sustainable agricultural development. In addition, the sector still faces structural weaknesses, including fragmented production, limited value addition, insufficient application of advanced technology and weak linkages between farmers, enterprises and markets. Against this backdrop, promoting sustainable agricultural development in Vietnam is an urgent requirement. It involves harmonizing three pillars: economic efficiency, social inclusiveness and environmental protection. Sustainable agriculture not only aims to increase productivity and competitiveness but also to enhance resilience, ensure long-term food security and protect natural resources for future generations. This study explores the current status, challenges and opportunities of Vietnam's agricultural sector in the context of sustainable development. It highlights key strategies such as applying green technologies, restructuring production models, improving value chains and strengthening institutional frameworks. The paper also provides policy recommendations to support innovation, improve farmers' income and foster resilience against climate and market uncertainties, thereby contributing to the overall goal of sustainable economic development in Vietnam.

2. THEORETICAL BASIS

The concept of sustainable agriculture has been widely studied in both developed and developing countries. According to the Food and Agriculture Organization (FAO, 2018), sustainable agriculture is defined as the management and conservation of natural resources, combined with technological and institutional changes, to ensure that current and future generations can meet their food and livelihood needs. This approach emphasizes three main dimensions: economic efficiency,

environmental sustainability and social equity (Jules Pretty, 2008).

Global research has pointed out that sustainable agriculture requires shifting from input-intensive farming systems to resource-efficient and environmentally friendly practices. For instance, studies by Tilman et al. (2011) show that the adoption of precision farming, crop diversification and integrated pest management significantly reduces environmental impacts while maintaining productivity. In addition, Porter et al. (2014) highlight the importance of developing resilient agricultural systems that can adapt to climate change and market uncertainties. Many countries, such as the Netherlands and Japan, have successfully implemented sustainable agriculture by applying high technology, building strong value chains and promoting policies that encourage eco-friendly practices.

In Vietnam, sustainable agricultural development has been a strategic priority since the early 2000s, as reflected in national programs and policies such as the "New Rural Development Program" and the "Green Growth Strategy." Several studies (Thi Hong Linh Phi & Huyen Bui Thi Thanh, 2022; Xuan Thang, 2025) indicate that Vietnam has made progress in diversifying crops, adopting organic farming and enhancing farmer cooperatives. However, challenges remain in terms of fragmented land use, limited financial and technical resources and weak linkages between production and markets. Research by Nguyen Van Tung (2024) emphasizes the need for stronger institutional frameworks and policy support to encourage investment in green technologies and climate-resilient agricultural practices.

3. STATUS OF SUSTAINABLE AGRICULTURE IN VIETNAM

At the beginning of 2024, Vietnam's agricultural sector continued to struggle with difficulties caused by unfavorable weather patterns and global market instability. Nevertheless with strong policy direction from the central government, close coordination among different levels of administration and the resilience of local communities, agriculture, forestry and fisheries still managed to maintain stable growth, thereby making an important contribution to economic development and social well-being. This section provides a comprehensive overview of the situation in the three key sectors of crop cultivation, forestry and fisheries, while also identifying the major challenges that need to be addressed in order to advance sustainable development.

In terms of agriculture, a process of deep restructuring toward greater efficiency and higher product quality has been underway. By 2024, the total area devoted to rice cultivation nationwide had reached 7.13 million hectares, which represented an increase of 12 thousand hectares compared with 2023. However, the average yield declined slightly to 6.09 tons per hectare, mainly due to typhoon damage and extreme weather in the northern provinces. As a result, the total rice output for the year was estimated at 43.46 million tons, showing a decrease of 33.6 thousand tons compared with the previous year.

Table 1: Distribution of Rice-Growing Area, Yield and Production by Season in 2024

Season	Area (thousand ha)	Yield (tons/ha)	Output (thousand tons)	Change vs. 2023 (thousand tons)
Winter-Spring	2,950	6.88	20,330	+145.0
Summer-Autumn	1,910	5.84	11,160	+139.1
Autumn-Winter	717.9	5.79	4,160	+118.5
Seasonal Rice	1,550	5.04	7,810	–436.4

(Source: General Statistics Office of Vietnam, 2025)

Although overall rice production experienced a slight decline, the introduction of high-quality rice varieties and the wider application of advanced farming techniques, particularly the "One Must, Five Reductions" model, enabled the sector to maintain domestic supply, safeguard national food security and ensure stable volumes for export.

In addition to rice, Vietnam's crop structure has continued to evolve in a positive direction. Cultivation areas for crops with relatively low economic returns, such as maize, peanuts and

soybeans, have been reduced, while more land has been allocated to vegetables, fruit trees and fodder crops. This transition reflects the increasing adoption of a circular agricultural economy with farmers gradually shifting toward more sustainable and market-responsive practices.

The fruit sector, in particular, demonstrated impressive growth with durian output rising by 25.7%, underscoring its strong export potential to markets such as China and South Korea. However, several fruit crops were negatively affected by unfavorable weather conditions. Longan production fell by 11.7%, while lychee suffered a significant decline of 33.9%, highlighting the continuing vulnerability of fruit cultivation to climate variability.

The livestock industry showed encouraging signs of recovery after the severe impact of African swine fever. The pig herd expanded by 4.1 percent, while poultry farming maintained stability with integrated closed-loop production systems, connecting breeding, processing and distribution, becoming more widespread. These models not only helped minimize the risk of epidemics but also improved product traceability and food safety, both of which are essential for domestic consumers and export markets.

To meet rising demand during festive seasons such as Tet, restocking activities were carried out alongside strengthened disease control measures. Large-scale vaccination campaigns were organized in a timely manner and monitoring systems were enhanced to enable the early detection and rapid containment of outbreaks. Despite these efforts, localized cases of avian influenza, foot-and-mouth disease, lumpy skin disease and African swine fever were still reported in several provinces by the end of 2024.

Production outputs continued to grow across most product categories. Pork production reached 5.18 million tons, up 6.6 percent year-on-year, while poultry meat climbed to 2.43 million tons, an increase of 5.4 percent. Egg production surpassed 20.1 billion units, up 5.0 percent and milk output rose to 1.24 million tons, reflecting stronger herd management and improved productivity. These results demonstrate the sector's resilience and its gradual transformation toward more sustainable and efficient production practices. Nevertheless, maintaining long-term progress will require sustained investment in epidemic prevention, value chain linkages and the broader adoption of high-tech, biosecure livestock farming nationwide.

Vietnam's forestry sector also recorded steady progress in 2024, continuing to play an important role in environmental protection and green economic growth. The area of newly planted forests reached 301.3 thousand hectares, an increase of 1.7 percent compared with 2023, while harvested timber output rose to 23.3 million cubic meters, representing a 7.9 percent increase due to high demand for raw wood materials. At the same time, forest protection efforts yielded positive results with the total area of damaged forest declining by 5.5 percent. Nonetheless, the incidence of forest fires rose by around 10 percent, largely because of prolonged periods of hot and dry weather in the early months of the year.

The fisheries sector remained a key contributor to exports while moving further toward high-tech aquaculture. In 2024, total fisheries output reached 9.55 million tons, up 2.5 percent from the previous year. Aquaculture accounted for 5.72 million tons, growing by 4.0 percent, whereas capture fisheries contributed 3.82 million tons with only marginal growth (General Statistics Office of Vietnam, 2025). Pangasius and whiteleg shrimp continued to serve as the leading export-oriented products, generating significant revenue. The adoption of advanced aquaculture technologies, such as recirculating systems that rely on probiotics instead of chemicals, has been expanding, gradually replacing traditional farming methods and improving both efficiency and sustainability. In contrast, marine capture fisheries showed little growth as authorities tightened quotas and strengthened conservation measures. This development is consistent with the national strategy of promoting sustainable fisheries while preserving marine resources for the future.

4. KEY CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT

Although Vietnam's agricultural sector achieved notable progress in 2024, it continues to face a range of difficulties that could hinder its ability to pursue sustainable development in the long term (Tran Thi Anh Nguyet, 2025). One of the most pressing challenges is climate change, which has

become increasingly severe and unpredictable. The growing frequency of prolonged droughts, destructive floods, rising sea levels and powerful typhoons has not only reduced crop yields but also disrupted production cycles and threatened national food security. These extreme weather patterns place additional burdens on farmers, forcing them to spend more on preventive measures and recovery activities. Alongside climate risks, crop production is also constrained by land degradation, declining soil fertility and water shortages, all of which reduce the potential for maintaining stable productivity. Meanwhile, livestock and fruit farming remain particularly vulnerable to disease outbreaks and the limited capacity of veterinary and biosecurity systems makes it difficult to control such risks effectively.

Beyond environmental challenges, Vietnam's agriculture also faces mounting economic pressures. The volatility of global markets has created uncertainties for exports, as producers must cope with rising input costs for fertilizers, feed and energy. At the same time, international markets are imposing increasingly strict requirements related to food safety, traceability and sustainability standards. Meeting these requirements requires significant investment, which is especially challenging for smallholder farmers with limited resources. Competition from regional agricultural producers, many of whom benefit from advanced technology and modern supply chains, has further intensified these difficulties. In the fisheries sector, aquaculture has expanded considerably, but marine capture resources are being depleted, making strict management and conservation measures essential to avoid overexploitation. The forestry sector also confronts risks from illegal logging, land encroachment and more frequent forest fires, which threaten to undermine the achievements made in reforestation and biodiversity protection.

Despite these challenges, Vietnam's agricultural development also benefits from important opportunities that can support its transition toward a greener, more resilient and higher-value sector. The government has introduced policies that prioritize sustainable practices with a strong focus on encouraging organic farming, reducing chemical use and promoting renewable energy in agricultural production. At the same time, global consumer demand for safe, environmentally friendly and traceable products is increasing, creating favorable conditions for Vietnamese producers to access premium markets. The wider availability of modern technologies, including digital farming tools, precision agriculture systems, smart irrigation techniques and biosecure aquaculture, provides powerful means to enhance efficiency and reduce environmental impacts.

In addition, the growing role of public–private partnerships and cooperation with international organizations is helping to mobilize resources and bring in advanced knowledge and innovation for rural and agricultural development. The application of circular economy principles, such as converting agricultural by-products into renewable energy or organic fertilizer, is also opening new directions to improve both productivity and environmental sustainability. Together, these opportunities provide a strong foundation for Vietnam to overcome current obstacles and accelerate its path toward sustainable agricultural growth.

5. POLICY DIRECTIONS AND STRATEGIC SOLUTIONS FOR SUSTAINABLE AGRICULTURE

In order to ensure that Vietnam's agricultural sector develops in a sustainable, resilient and competitive manner, the formulation and implementation of appropriate policy directions and strategic solutions play a crucial role. Building on achievements already obtained while addressing existing shortcomings, these solutions should be comprehensive, integrating economic, social and environmental objectives.

A first and most urgent policy direction is to strengthen climate resilience and natural resource management. The impacts of climate change, including droughts, floods, salinity intrusion and rising sea levels, require agricultural policies that prioritize adaptive strategies. This includes investment in climate-smart agriculture, diversification of crops to reduce dependency on climate-sensitive products and the promotion of drought-resistant and salt-tolerant varieties. Water resources must be managed more efficiently through smart irrigation systems, rainwater harvesting and better watershed protection. At the same time, soil fertility needs to be preserved by adopting organic fertilizers, crop rotation and conservation agriculture practices. These measures not only protect natural

resources but also reduce the long-term costs of production for farmers.

A second policy priority is to promote green growth and low-carbon agriculture. The government should continue to integrate agricultural development with the national green growth strategy by reducing greenhouse gas emissions from farming activities, livestock rearing and aquaculture. Encouraging the use of renewable energy, such as solar or biogas systems in rural areas, will help reduce dependence on fossil fuels. Policies should also support circular economy approaches, where agricultural by-products are recycled into organic fertilizers, animal feed or bioenergy, thereby minimizing waste and enhancing value creation within the sector.

Third, there is a need to enhance food safety, quality standards and traceability systems to meet the increasingly strict requirements of international markets. Vietnam must invest in modernizing post-harvest processing, storage and logistics infrastructure to minimize losses and maintain product quality. Developing a national traceability platform and aligning domestic regulations with global standards will strengthen consumer confidence and allow Vietnamese agricultural products to gain stronger positions in high-value markets. In this regard, training programs for farmers, cooperatives and small enterprises on compliance with food safety and sustainability certifications are equally essential.

Another strategic solution involves harnessing science, technology and digital transformation in agriculture. Digital farming, precision agriculture, remote sensing and artificial intelligence applications can significantly increase efficiency in resource use, monitor crop conditions and predict pest or disease outbreaks. Biotechnology should be promoted to develop high-yield and disease-resistant crop varieties. The government can play a facilitating role by investing in agricultural research institutions, expanding extension services and creating incentives for private sector participation in innovation. Bridging the digital divide in rural areas through broadband access and digital literacy programs will ensure that farmers, including smallholders, can benefit from technological advances.

In addition, it is critical to strengthen institutions and governance in rural and agricultural development. Effective implementation of policies requires coordination between central and local governments, as well as active participation of farmers, cooperatives and agribusiness enterprises. Institutional reforms should focus on reducing bureaucratic barriers, enhancing transparency in land management and providing secure land tenure for farmers to encourage long-term investment in sustainable practices. At the same time, monitoring and evaluation systems should be improved to assess the environmental and social impacts of agricultural policies and programs.

A further policy direction is to expand international cooperation and trade partnerships. Vietnam should actively engage in regional and global agricultural networks to share knowledge, access new technologies and promote its products in diverse markets. Free trade agreements can be leveraged to open new opportunities, but this also requires domestic reforms to ensure that farmers and enterprises are capable of meeting international commitments. Development cooperation with international organizations can mobilize financial support and technical assistance for sustainable agricultural initiatives, especially in areas such as climate change adaptation and rural poverty reduction.

Lastly, sustainable agricultural development must also be people-centered and inclusive, ensuring that rural communities benefit equitably from growth. Policies should focus on improving rural livelihoods, promoting gender equality in agricultural decision-making and empowering youth to engage in modern agribusiness models. Strengthening vocational training and agricultural education will equip the workforce with the skills required to adapt to new technologies and changing market conditions. Social safety nets and insurance mechanisms should be expanded to protect farmers from market fluctuations, natural disasters and disease outbreaks, thereby enhancing resilience at the household level.

Taken together, these policy directions and strategic solutions provide a comprehensive roadmap for Vietnam to transition from a traditional, resource-intensive agricultural model to one that is modern, environmentally sustainable and globally competitive. By integrating climate resilience, green growth, technological innovation, institutional reforms and social inclusiveness, Vietnam can secure its

position as a leading agricultural producer while safeguarding natural resources and improving the quality of life for rural communities.

6. CONCLUSION

The sustainable development of Vietnam's agriculture is both a strategic necessity and a long-term vision that underpins national food security, rural livelihoods and economic competitiveness in the global market. The analysis has shown that while the sector has recorded significant achievements in recent years, it continues to face profound challenges arising from climate change, resource degradation, global market uncertainties and institutional limitations. These challenges highlight the urgent need for a shift from traditional, input-intensive models of production toward approaches that emphasize resilience, efficiency and environmental responsibility. At the same time, Vietnam is presented with valuable opportunities that can accelerate this transformation. Strong government commitment to green growth, rising global demand for safe and traceable food and rapid advancements in digital and biological technologies create favorable conditions for agricultural modernization. The active participation of multiple stakeholders, including farmers, cooperatives, private enterprises, research institutions and international partners, will be essential in turning these opportunities into concrete achievements. Moving forward, sustainable agriculture in Vietnam must be guided by a set of integrated solutions that balance economic, social and environmental objectives. This includes building climate-resilient production systems, promoting low-carbon and circular economy practices, enhancing food quality and traceability, strengthening rural governance and expanding international cooperation. Equally important is ensuring inclusiveness by empowering rural communities, improving human capital and creating equitable access to resources and markets. In conclusion, promoting the sustainable development of agriculture in Vietnam is not merely a sectoral goal but a national priority that directly contributes to poverty reduction, environmental conservation and long-term prosperity. With coherent policies, strategic investments and active collaboration across different levels of society, Vietnam's agriculture can successfully transition into a modern, green and high-value sector that meets both domestic needs and global expectations.

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