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SOME SOLUTIONS FOR PROMOTING SUSTAINABLE AGRICULTURAL DEVELOPMENT IN VIETNAM IN THE NEW CONTEX

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ABSTRACT
Sustainable agricultural development has become an inevitable pathway for Vietnam amid intensifying climate change, increasing pressures of international integration, and the urgent need to ensure national food security and rural livelihoods. This paper utilizes statistical data from 2024 to analyze the current state of Vietnam's agricultural sector based on three core pillars: agriculture, forestry, and fisheries. From this assessment, the paper proposes strategic directions and practical solutions to foster a transition toward a modern, adaptive, and sustainable agricultural system.

Keywords:
Sustainable agriculture, climate change, agricultural restructuring, circular agriculture, Vietnam.

1. INTRODUCTION

Agriculture has long served as a pillar of Vietnam's economy, not only ensuring national food security but also providing the primary livelihood for over 60% of the rural population. In the current stage of development, agriculture continues to play a vital role in stabilizing the macroeconomy, reducing poverty, and contributing to sustainable development. However, Vietnam's agricultural sector is facing unprecedented challenges, both internal and external, which demand comprehensive, modern, and sustainable development strategies. First and foremost, climate change has become a critical factor profoundly affecting the productivity, quality, and structure of agricultural production. Increasingly frequent droughts, saltwater intrusion, flash floods, and extreme weather events pose serious threats to farmers' livelihoods and national food security. According to statistics in 2024, rice yields and key crop outputs in northern and central provinces significantly declined due to the impacts of Typhoon No. 3 and prolonged water shortages. Meanwhile, saltwater intrusion continues to be a major threat to the Mekong Delta – the country's primary rice and aquaculture production area. Second, the traditional agricultural production model reveals numerous limitations: small and fragmented farm sizes, low investment levels, limited mechanization and technological application, weak value chain linkages, and inconsistent product quality with poor traceability. In addition, rapid urbanization and industrialization have led to the shrinking of agricultural land and a decline in interest among the younger generation in pursuing agricultural livelihoods, creating gaps in knowledge transfer and innovation. Third, the context of deep international economic integration—especially commitments to emission reduction, environmental protection, and compliance with high-quality standards under new-generation free trade agreements (FTAs)—poses increasing challenges for Vietnamese agricultural products. Without timely transition toward sustainable practices, the sector risks falling behind, losing export market share, and facing increasingly strict technical barriers from global markets. In this context, sustainable agricultural development is no longer just about maintaining output growth. More importantly, it entails harmonizing economic, social, and environmental goals. This includes transitioning to ecological and circular agricultural models, applying high technology, enhancing resource efficiency, reducing greenhouse gas emissions, protecting ecosystems, and strengthening the resilience of production systems against external shocks. Given this landscape, the present study provides a comprehensive analysis of Vietnam's agricultural development in 2024 based on the latest data from the General Statistics Office. It further assesses emerging opportunities and challenges and proposes strategic directions to foster a sustainable, modern, and efficient transformation of the national agricultural sector in the coming period.

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2. THEORETICAL FRAMEWORK

The concept of "sustainable agricultural development" first emerged and gradually took shape in the 1980s, closely associated with a shift in global development thinking in response to growing environmental challenges, resource depletion, and social instability. According to the Food and Agriculture Organization of the United Nations (FAO), sustainable agricultural development is defined as "the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations" (FAO, 2014).

From an academic perspective, numerous studies have emphasized that sustainable agriculture is built upon three fundamental pillars: economic efficiency, social equity, and ecological sustainability (Pretty, 2007). Achieving a balance among these dimensions is a prerequisite for building an agricultural system that not only grows in output, but is also resilient, adaptable to risks, and capable of driving comprehensive rural development.

One of the core elements of sustainable agriculture is the efficient use of agricultural inputs—particularly land, water, energy, and biodiversity. Overuse of chemical fertilizers, pesticides, and groundwater in traditional farming practices has contributed to soil degradation, water pollution, and increased greenhouse gas emissions. In contrast, ecological farming models, organic agriculture, and climate-smart agriculture (CSA) emphasize emission reductions, resource efficiency, and system resilience—aligning with international commitments under the Paris Agreement and national green growth strategies.

In addition, modern theories such as value chain theory and the circular economy have been widely applied in agricultural policy-making. As noted by Porter (1985), the added value of agricultural products is not limited to the production stage but extends across processing, distribution, and marketing. Thus, value chain linkages are essential for helping farmers access markets, ensure stable outputs, and increase product value. Meanwhile, the circular economy—with its principles of "reduce – reuse – recycle" and "closing the loop"—offers a promising approach to minimizing agricultural waste, regenerating natural resources, and protecting ecosystems.

In Vietnam, the orientation toward sustainable agricultural development has been clearly articulated in a number of key policy documents, including the Central Party's Resolution No. 19-NQ/TW (2022) on agriculture, farmers, and rural areas to 2030 with a vision to 2045; the Strategy for Sustainable Agriculture and Rural Development 2021–2030; the National Green Growth Strategy; and Vietnam's strong commitment at COP26 to achieve net-zero emissions by 2050.

From the above analysis, it can be concluded that sustainable agricultural development is not only a long-term development requirement, but also an inevitable trend to enhance competitiveness, ensure livelihoods, and adapt to climate change. Studying the current status and proposing solutions to promote sustainable agriculture in Vietnam is therefore a task of both theoretical and practical significance.

3. THE CURRENT STATE OF SUSTAINABLE AGRICULTURAL DEVELOPMENT IN VIETNAM

Entering 2024, Vietnam's agricultural sector continued to face numerous difficulties stemming from unfavorable weather conditions and market fluctuations. However, thanks to strong leadership from the central government, coordinated efforts across all levels of administration, and the resilience of local communities, the agriculture, forestry, and fisheries sectors maintained steady growth, contributing positively to national economic development and social welfare. This section provides an in-depth analysis of the current situation in the three main sectors—agriculture, forestry, and fisheries—and identifies key challenges for achieving sustainable development.

3.1. Agriculture: Deep Restructuring Toward Efficiency and Quality

In 2024, the total area cultivated with rice nationwide reached 7.13 million hectares, an increase of 12 thousand hectares compared to 2023. However, the average yield slightly declined to 6.09 tons per hectare, mainly due to typhoon impacts and extreme weather in northern provinces. Consequently, the total rice output for the year was estimated at 43.46 million tons, down 33.6 thousand tons from the previous year.

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Table 1. Rice Cultivation Area, Yield, and Output by Season in 2024

Rice 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 (GSO), 2025)

Although total rice output declined, the adoption of high-quality rice varieties and advanced cultivation practices—particularly the "One Must, Five Reductions" model—enabled the rice sector to continue meeting domestic demand, maintaining national food security, and ensuring stable export supply.

Beyond rice, the crop structure has continued to shift in a positive direction. Crops with lower economic efficiency, such as maize, peanuts, and soybeans, have seen reduced cultivation areas, making way for vegetables, fruit trees, and fodder crops. This reflects the growing adoption of a circular agricultural economy mindset across farming communities.

Table 2. Key Crops of Vietnam in 2024

Crop Type	Area (thousand ha)	Output (thousand tons)	Change vs. 2023 (%)
Maize	870.9	4,400	–0.7
Peanut	148.4	398.4	–0.4
Sweet potato	80.9	971.9	+6.2
Various vegetables	>1,000	19,300	+1.3
Durian	–	1,503.2	+25.7
Orange	–	1,888.8	+3.6
Dragon fruit	–	1,190.9	–0.1

(Source: General Statistics Office (GSO), 2025)

Notably, the fruit crop segment recorded strong growth, with durian production increasing by 25.7%, highlighting its significant export potential to markets such as China and South Korea. However, several fruit types were heavily affected by adverse weather conditions, particularly longan (–11.7%) and lychee (–33.9%).

In terms of livestock, the sector experienced a positive recovery following the impacts of African swine fever. The pig population increased by 4.1%, while poultry farming remained stable, with closed-loop models—from farm to table—becoming increasingly common.

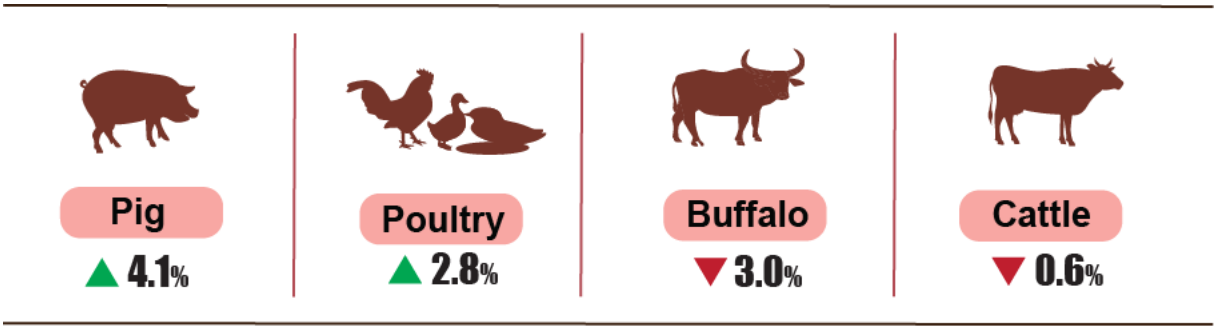

Figure 1. The growth rate of the population of livestock at the end of December, 2024 compared to the same time last year
(Source: General Statistics Office (GSO), 2025)

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Poultry production remained a stable pillar of the sector, with many localities expanding integrated farming systems that promote biosecurity and form closed-loop chains connecting breeding, processing, and consumption. These models not only help reduce disease risks but also enhance traceability and food safety—key requirements in both domestic and export markets.

Alongside restocking activities aimed at meeting high seasonal demand during holidays and Tet, the sector placed strong emphasis on epidemic prevention and control. Mass vaccination campaigns were carried out in a timely manner, and disease surveillance systems were strengthened to quickly identify and contain new outbreaks. However, as of late 2024, challenges remained, with localized cases of avian influenza, foot-and-mouth disease, lumpy skin disease (LSD), and African swine fever still reported in several provinces.

Production outputs continued to increase across major product lines. In 2024, live-weight pork reached 5.18 million tons (up 6.6% year-on-year), poultry meat reached 2.43 million tons (+5.4%), and egg production totaled over 20.1 billion units (+5.0%). Milk production also recorded solid growth at 1.24 million tons (+6.0%), reflecting improvements in dairy herd management and productivity.

These figures underscore the resilience of Vietnam's livestock industry and highlight its gradual shift toward more sustainable and efficient models. Nevertheless, sustained progress will depend on continued investment in disease control, value chain development, and the scaling of biosecure, high-tech livestock farming practices nationwide.

3.2. Forestry: Growth in Area and Output Toward Sustainable Development

Vietnam's forestry sector maintained steady progress in 2024, playing a crucial role in environmental protection and green economic development. During the year, the area of newly planted forests reached 301.3 thousand hectares, marking a 1.7% increase compared to 2023. Harvested timber volume rose significantly to 23.3 million cubic meters, up 7.9%, driven by strong demand for raw wood materials.

Table 3. Forestry Performance in 2024

Indicator	Value	Change vs. 2023 (%)
Newly planted concentrated forests	301.3 thousand ha	+1.7
Scattered planted trees	117.5 million trees	+2.6
Timber harvested	23,334.1 thousand m³	+7.9
Forest area damaged	1,627.3 ha	–5.5

(Source: General Statistics Office (GSO), 2025)

Several provinces recorded particularly sharp increases in harvested timber output, including Quang Ninh (+41.7%), Nghe An (+18.0%), and Quang Binh (+13.7%). However, the total area of forest fires rose by 10% due to prolonged hot and dry weather during the early months of the year.

3.3. Fisheries: A Pillar of Export and Transition Toward High-Tech Aquaculture

In 2024, the total fisheries output in Vietnam reached 9.547 million tons, an increase of 2.5% compared to the previous year. Of this, aquaculture production accounted for 5.72 million tons (+4.0%), while capture fisheries contributed 3.82 million tons (+0.3%).

Table 4. Structure of Fisheries Output in 2024

Type of Aquatic Product	Aquaculture (thousand tons)	Capture (thousand tons)	Total (thousand tons)	Change vs. 2023 (%)
Fish	3,826.6	2,946.5	6,773.1	+2.2
Shrimp	1,246.5	138.8	1,385.3	+5.1
Other aquatic products	648.5	740.1	1,388.6	+1.1
Total	5,721.6	3,825.4	9,547.0	+2.5

(Source: General Statistics Office (GSO), 2025)

Pangasius (tra fish) and whiteleg shrimp remained the two key export-oriented aquaculture products, contributing significantly to the country's seafood export revenue. The adoption of advanced technologies in shrimp

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farming—particularly closed-loop recirculating systems using probiotics instead of chemicals—is gradually replacing traditional farming methods, helping improve both efficiency and sustainability.

However, marine capture output showed virtually no growth due to the strict enforcement of fishing quotas and enhanced efforts to conserve marine resources. This trend aligns well with the strategic orientation of promoting sustainable fisheries development in the years ahead.

4. EVALUATION AND EMERGING ISSUES

4.1. Positive Outcomes Achieved

Based on the analysis of the current situation, it is evident that Vietnam's agricultural sector in 2024 has maintained a stable growth trajectory, demonstrating adaptability in the face of weather fluctuations and market volatility. Several notable achievements can be highlighted:

First, the sector's structure has shifted positively toward higher value and reduced dependence on raw output. Although the total area under rice cultivation did not increase significantly, productivity and quality improved thanks to the adoption of new varieties and advanced farming techniques. Many localities have effectively implemented models such as "One Must, Five Reductions", "Three Reductions, Three Gains", and climate-smart agriculture (CSA).

Second, agricultural production has begun transitioning toward circularity, efficiency, and ecological sustainability. Areas planted with low-efficiency crops such as maize and soybeans have been rationally reduced in favor of vegetables and fruit trees that better meet market demand. Notably, fruit crops like durian, orange, mango, and banana have seen significant growth in output, indicating strong export potential.

Third, both livestock and aquaculture sectors have continued to recover, with increased application of advanced technologies and expansion of value chain-based models. Vaccination coverage has improved, and greater attention has been paid to epidemic prevention. In particular, aquaculture—especially pangasius and whiteleg shrimp—has shifted toward closed-loop systems that save water, reduce chemical use, and improve disease control.

Fourth, the forestry sector experienced considerable growth, reflected in increased areas of newly planted forests and significant rises in timber output. Many localities are now promoting forestry development within a green economic framework, contributing to national goals on green growth and emissions reduction.

4.2. Key Challenges Ahead

Despite the progress made, Vietnam’s transition toward sustainable agriculture continues to face various challenges and shortcomings that must be clearly identified and addressed.

First, the effects of climate change have become increasingly evident, posing direct threats to agricultural yield, productivity, and quality. Saltwater intrusion in the Mekong Delta, drought in the Central Highlands, and abnormal flooding in the North are all disrupting seasonal planning, raising production costs, and increasing risks for farmers.

Second, agricultural production remains largely small-scale and fragmented. The proportion of land cultivated under large-scale contracts or organized through value chain linkages remains low. Efforts to reorganize production around raw material zones and modern cooperatives have yet to deliver consistent and effective results across regions.

Third, investment in science and technology—particularly biotechnology and digital transformation in agriculture—remains limited. High-tech and digital agriculture models are still scattered and have not been widely replicated, especially in remote and disadvantaged areas. Furthermore, the lack of a unified agricultural and rural database continues to hinder effective management, forecasting, and policymaking.

Fourth, growing international integration pressures require Vietnamese agriculture to meet higher standards of quality, traceability, and sustainability. However, national efforts to build strong agricultural brands, logistics networks, and post-harvest processing infrastructure remain inadequate to meet such demands.

Fifth, greenhouse gas emissions from agriculture—especially from livestock and wet rice cultivation—have become a pressing challenge, particularly as Vietnam has committed to achieving net-zero emissions by 2050. Transitioning to low-emission, circular, and resource-efficient production models requires substantial investment, yet capital mobilization—especially at the local level—remains highly constrained.

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5. STRATEGIC DIRECTIONS AND SOLUTIONS FOR PROMOTING SUSTAINABLE AGRICULTURAL DEVELOPMENT IN VIETNAM

To build a sustainable, modern, and resilient agricultural sector capable of withstanding external shocks, Vietnam must implement a synchronized set of strategic directions and solutions tailored to both local conditions and global trends. This section outlines five key policy and technical solution groups:

5.1. Restructuring Agricultural Production in Response to Climate Change

Amid increasingly severe climate change impacts on agricultural activities, production restructuring must go beyond simply shifting crop and livestock composition for economic efficiency. It must also integrate climate adaptation and disaster resilience objectives. The restructuring process should focus on developing commodity groups with ecological and market advantages that minimize resource use and are resilient to stressors.

For instance, in regions prone to saltwater intrusion such as the Mekong Delta, it is essential to transition from triple rice cropping to integrated models like rice–shrimp, rice–fish, or salt-tolerant fruit trees, supported by climate-resilient crop varieties. Agro-ecological zoning should be aligned with irrigation infrastructure planning, storage facilities, and processing systems to ensure integrated and efficient value chains. Additionally, the adoption of climate-smart agriculture (CSA) should be expanded, along with the development of early warning systems for natural disasters, pests, and market risks to enable proactive planning and risk mitigation for producers.

5.2. Promoting Circular, Ecological Agriculture and Low-Emission Practices

Sustainable agricultural development requires a shift from a linear production model (produce – consume – discard) to a circular one, in which agricultural by-products are reused as inputs for new production cycles, minimizing resource waste and environmental pollution. In Vietnam, agricultural residues such as rice straw, manure, rice husks, and sugarcane bagasse amount to tens of millions of tons annually, yet much of this remains underutilized.

It is therefore vital to establish policies and incentives that encourage the reuse of these by-products to produce organic fertilizers, animal feed, or bioenergy. At the same time, integrated production models like VAC (garden–pond–livestock), circular crop–livestock–aquaculture systems, and organic agriculture should be scaled up to enhance resource efficiency and protect the ecological environment. Practical low-emission solutions such as the “One Must, Five Reductions” model, alternate wetting and drying (AWD) irrigation, and the use of biological agents instead of chemical inputs in farming and livestock should also be promoted. These practices not only help meet Vietnam’s net-zero emission commitment by 2050 but also increase resilience and the green value of agricultural exports.

5.3. Advancing Science, Technology, and Digital Transformation in Agriculture

Science and technology are essential drivers for improving productivity, quality, and sustainability in modern agriculture. In recent years, Vietnam has made notable progress in crop and livestock breeding research. However, the application of high-tech farming remains limited and concentrated in a few pilot areas within key economic zones.

In the context of the Fourth Industrial Revolution, agriculture must undergo comprehensive digital transformation across all stages—from production and harvesting to processing and marketing. Technologies such as the Internet of Things (IoT) for monitoring weather, soil, and pests; artificial intelligence (AI) for analyzing production data; blockchain for traceability; and precision agriculture are becoming essential trends. Furthermore, building big data infrastructure for the agricultural sector, developing digital platforms for farm management, e-commerce for agricultural products, and early risk warning systems will revolutionize agricultural governance and enhance Vietnam’s competitiveness in the global market.

5.4. Strengthening Value Chain Linkages, Cooperative Economy, and Agricultural Logistics

One of the main bottlenecks in Vietnamese agriculture is fragmented and small-scale production with weak linkages among value chain stakeholders. The recurring phenomena of "bumper harvests with falling prices" and market saturation are direct consequences of poor production zoning, a lack of purchasing contracts, and the limited role of processing and distribution enterprises in the agricultural supply chain.

To address this, it is crucial to foster the development of new-style cooperatives and producer groups closely linked with businesses, scientists, and financial institutions in a "five-house" model (farmer – state – scientist – entrepreneur – banker). Supporting localities in building regional agricultural brands, geographical indications, quality certification systems, and product offtake agreements will enhance farmer income and long-term market access.

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In parallel, infrastructure investment in agricultural logistics—including cold storage, post-harvest processing centers, dedicated transport systems, and commodity exchanges—should be prioritized to reduce post-harvest losses and boost export capacity. Key production regions such as the Mekong Delta, Central Highlands, and North Central Coast should be given priority in the development of integrated logistics systems tied to raw material zones and domestic/international markets.

5.5. Improving Policy Frameworks and Mobilizing Resources for Sustainable Agriculture

An enabling policy environment is fundamental for sustainable agriculture to flourish. However, many current policies remain fragmented and insufficient to attract private sector investment—especially in high-tech agriculture, organic farming, and circular economy initiatives. A comprehensive review and reform of the policy system is therefore needed to support sustainable models effectively—from subsidies for seedlings and organic inputs, to agricultural insurance, green credit, and environmental tax incentives.

In addition, improving farmers' access to capital through expanding agricultural development funds, microfinance, and loans for high-tech agriculture is essential. Capacity-building efforts should also be intensified at the local level, including training for technical staff and strengthening cooperative governance.

Finally, the government should establish mechanisms to promote public–private partnerships (PPP) in rural infrastructure development, agricultural logistics, and innovation in agritech and sustainable farming practices.

CONCLUSION

In the face of increasingly severe climate change, intensifying market competition, and rising demands for quality and environmental standards in the global agricultural supply chain, sustainable agricultural development has become both an inevitable trend and a long-term strategic goal for Vietnam. Analyzing the sector's performance in 2024 reveals that Vietnam's agriculture has achieved significant progress, demonstrated through steady growth across crop cultivation, livestock, fisheries, and forestry. This progress reflects a clear shift in production models—from extensive to intensive, from quantity to quality, from fragmented to value chain-linked, and from traditional to high-tech approaches. However, the transition toward sustainable agriculture in Vietnam continues to face several critical challenges, including: adverse impacts of extreme weather events, small-scale and fragmented production systems, weak value chain integration, limited adoption of scientific and technological advancements, and an underdeveloped and inconsistent policy framework. If left unaddressed, these issues could hinder the country's shift toward green agriculture and erode the competitiveness of Vietnamese agricultural products in international markets. To promote sustainable agricultural development, it is essential to ensure strategic coherence and effective implementation, focusing on five key solution groups: (i) restructuring agricultural production in response to climate change; (ii) promoting ecological, circular, and low-emission farming models; (iii) accelerating the application of science, technology, and digital transformation; (iv) strengthening value chain linkages and developing agricultural logistics; and (v) improving institutions, policies, and resource mobilization mechanisms. These solutions must be translated into practical action programs tailored to the specific socio-ecological conditions of each region, with active participation from farmers, businesses, local governments, and intermediary organizations. With strong political will, a sound strategic orientation, and synchronized, effective implementation of solutions, Vietnam's agriculture can transform significantly—not only continuing to serve as a pillar of the national economy and ensuring food security, but also evolving into a green, efficient, high-value sector that contributes substantially to the country's sustainable development in the coming decades.

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