

Green Agricultural Development in An Giang Province: Current Situation and Solutions¹

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ABSTRACT

Green agricultural development is becoming an inevitable trend to ensure food security, protect the environment, and adapt to climate change. The agricultural sector in An Giang province is gradually transitioning to a green agriculture model; however, it still faces many challenges such as environmental pollution, weak market linkages, and limited application of technology.

This article focuses on assessing the current state of agricultural development in An Giang, analyzing the factors affecting the transition to a green agricultural production model. Based on this analysis, the article proposes solutions including improvements in farming techniques, policy support, raising farmers' awareness, and promoting value chain linkages, with the aim of effectively fostering green agricultural development that suits local conditions.

Keywords: An Giang, development, current situation, Green agriculture, solutions

1. Introduction

Climate change and globalization are posing major challenges to agriculture, especially in key production areas such as the Mekong Delta [MD]. Increasing salinity intrusion, soil degradation, water pollution, and greenhouse gas emissions are reducing production efficiency and threatening food security and rural livelihoods. An Giang province a key agricultural hub in the Mekong Delta has many advantages in rice cultivation, aquaculture, and fruit production. However, traditional farming practices that rely heavily on chemical inputs are causing environmental consequences and lowering product quality. In the context of a growing market

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demand for safe and environmentally friendly agricultural products, transitioning to a green agriculture model has become an urgent requirement.

Based on this context, the topic “Promoting Green Agricultural Development in An Giang Province: Current Situation and Solutions” is conducted with the goal of comprehensively analyzing the current state of local agricultural production, identifying the factors affecting the transition to green agriculture, and proposing feasible solutions to promote agricultural development that is efficient, environmentally friendly, and adaptable to the new context.

2. Method

This study employs several research methods to clarify the issue of green agricultural development in An Giang province.

First, the analytical and synthetic method is used to examine relevant documents, analyze findings and arguments, and synthesize them to establish the main points of the research issue.

Second, the historical method is applied to describe the research topic over time, helping to identify the development process of green agriculture in An Giang province.

Finally, the logical method assists in identifying relevant and coherent research problems, aiming to draw practical and comprehensive theoretical insights.

3. Results

3.1. Theoretical basis

Agriculture

Agriculture includes crop and livestock production, fisheries, fisheries and forestry for food and non-food products [Food and Agriculture Organization of the United Nations, 2021].

Agriculture produces basic materials of society, providing crop products and livestock products [Language Institute, 2006, p.740].

Agriculture is a production field with specific characteristics, a production industry associated with crops and livestock, governed by biological laws, external conditions [land, weather - climate]. and is an industry that produces indispensable products for society to survive and develop. Agriculture in a broad sense includes forestry and fishery. Agriculture in the narrow sense is an industry that produces material wealth in which people must rely on the growth laws of plants and animals to create products such as food and food to satisfy their needs.

Green Agriculture

According to the Organisation for Economic Co-operation and Development [OECD], "green agriculture is a way of developing the agricultural sector that maximizes the use of clean resources, leading to a sustainable agricultural growth model that is more closely linked to environmental protection. Green agriculture, or more specifically organic agriculture, adheres to four principles: health, ecology, fairness, and care — gradually becoming a new direction for building a civilized agriculture that adapts to climate change" [OECD, 2010].

Green agriculture is a concept that shares many similarities with other environmentally friendly agricultural models such as organic farming, ecological farming, and high-tech agriculture that is adaptive to climate change. These models all aim to efficiently and economically utilize input resources for agricultural production while minimizing negative impacts on the natural environment [Đao Thi Ngoc Minh, To Duc Anh, 2025].

Green agriculture is a broad concept that is directly related to sustainable agriculture [Khuất Đăng Long, 2016]. It is considered an effective solution in the process of building new rural areas, aiming to create a clean and safe agriculture for humans and ecosystems, while also generating economic value for participating stakeholders [Nguyen Thi Thu Ha, 2023].

The "green economy" within green agriculture refers to the application of new knowledge, methods, and cultivation techniques to maintain and improve agricultural productivity and profitability while gradually reducing harmful environmental impacts. It also promotes the restoration of renewable resources and more efficient and sustainable use of natural inputs [Nguyen Song Tung and colleagues, 2015].

From the above perspectives, it can be seen that **green agriculture** is a broad concept that is directly related to **sustainable agriculture** [Khuat Dang Long, 2016]. Green agriculture is an effective solution closely associated with the process of building new rural areas, aiming to establish a clean, safe agricultural system for both humans and ecosystems, while also generating economic value for stakeholders [Nguyen Thị Thu Ha, 2023]. The essence of green agriculture lies in a **sustainable agricultural system** that revolves around ecological and economic factors [Vuong and Nguyen, 2024]. Therefore, green agriculture can be understood as a form of commodity agricultural production that seeks to "green" the production process — improving crop yields and product quality, while also contributing to environmental protection, enhancing food security, increasing profits for producers and businesses, and improving farmers' livelihoods.

Thus, green agriculture plays a vital role in agricultural development by ensuring sustainable growth, protecting the environment, and improving human health. The key aspect of green

agriculture is the balance between agricultural production and the conservation of natural resources. Green agriculture in the context of environmental concerns and genetically modified crops often refers to the increased application of both farming practices and technologies. This means maintaining and improving farm productivity and profitability while ensuring a sustainable food supply; minimizing adverse impacts; gradually transforming challenges into benefits; and regenerating natural resources. When referring to a green agricultural system, it should be understood more broadly as a sustainable agricultural model, because green agriculture has the potential to feed the world without harming the environment or threatening human health. This demonstrates that sustainable crop production practices can deliver high yields over time with lower investment and less environmental harm. Ecological agriculture, organic farming, and sustainable agriculture all share a common goal: to optimize the use of natural **resources** through rational management in order to produce safe, hygienic products while ensuring economic, social, and environmental sustainability [Nguyen Thi Dao, 2016].

The Role of Green Agriculture

Protecting human health and the environment: Green agriculture plays a crucial role in protecting human health and the environment by reducing reliance on harmful chemicals and minimizing chemical residues in agricultural products. This, in turn, helps lower greenhouse gas emissions, reduce forest fires, and mitigate negative environmental impacts, particularly protecting the health of farmers and rural communities.

Improving soil and water quality: Green agriculture helps prevent soil erosion, maintain soil fertility, and protect water sources from pollution. Limiting the use of chemical fertilizers and adhering to food safety standards also helps reduce the risk of toxic residues in food products.

Enhancing economic efficiency: Green agriculture applies advanced, scientific farming techniques to increase crop productivity and improve product quality. Additionally, reducing the use of harmful chemicals helps cut input costs, leading to increased income and more stable livelihoods for farmers. The essence of green agriculture lies in reducing, limiting, or overcoming the negative consequences caused by conventional farming practices [Khuất Đăng Long, 2016, pp. 7–8]. It is a form of sustainable agriculture that centers on ecological and economic factors [Vuong & Nguyen, 2024].

Promoting Biodiversity: Limiting the use of chemicals in farming creates a favorable environment for beneficial organisms, which in turn helps plants thrive. Green agriculture focuses on using smart farming practices, applying organic fertilizers, reducing the use of chemicals and pesticides, implementing water-saving irrigation systems, and especially utilizing digital technologies for better management. The goal of green agriculture is to achieve high and

sustainable productivity, while also minimizing negative environmental impacts, preserving biodiversity, and improving the quality of life for farmers.

3.2. Policy on Green Agricultural Development by the Government and An Giang Province

3.2.1. Government Policy on Green Agricultural Development

Green Agricultural Growth in Vietnam, recognizing the trend of green growth early, the Party and the State of Vietnam have issued numerous policies and strategies to create favorable conditions for green agricultural growth. On September 25, 2015, the Government issued Decision No. 1393/QĐ-TTg approving the National Green Growth Strategy, which mentions green agriculture through solutions such as the development of sustainable organic agriculture, reducing pollutant emissions, environmental degradation, efficient use of resources, technological innovation, and the widespread adoption of cleaner technologies. This decision laid the foundation for a series of legal documents to complete the policy framework from the central to the local levels.

Resolution No. 30/NQ-CP, dated March 7, 2017, from a regular Government meeting, also discussed and concluded on "Key solutions to promote the development of high-tech agriculture." The Ministry of Agriculture and Rural Development [MARD]. was tasked with urgently developing criteria to identify high-tech agricultural programs, projects, high-tech applications in agriculture, and criteria for defining clean agriculture. This resolution aimed to push MARD to quickly issue criteria for high-tech agricultural programs, clean agriculture, and the list of high-tech applications in agriculture. On March 14, 2017, Decision No. 738/QĐ-BNN-KHCN was issued, which established the Criteria for Identifying High-Tech Agriculture Programs and Clean Agriculture Projects.

On **August 29, 2018**, the Government issued **Decree No. 109/2018/ND-CP** on organic agriculture to support businesses, cooperatives, farms, households, and groups of households producing organic products. By **2020**, the **Organic Agriculture Development Project for the period 2020-2030** was approved in **Decision No. 885/QĐ-TTg dated June 23, 2020**, by the Prime Minister. The project was developed based on practical experience, methods, and the general orientation of the **Agricultural Restructuring Project** aimed at enhancing added value and sustainable development. This has been a consistent directive from the Central Government, the Government, and the Prime Minister over the years, and the agricultural sector has been actively implementing this policy. Additionally, organic agriculture has become a growing trend due to its ability to provide better products for human health and society.

Resolution No. 19-NQ/TW, dated June 16, 2022, "The Fifth Conference of the Central Committee of the Communist Party of Vietnam, the XIII term, on agriculture, farmers, and rural

areas until 2030, with a vision to 2045, outlines the development of agriculture towards ecological agriculture, focusing on the development of green agriculture, organic agriculture, and circular agriculture. It emphasizes the development of effective, sustainable, transparent, responsible, and multi-value-integrated agriculture following ecological principles, encouraging the growth of green, organic, and circular agriculture. It aims to promote the regional advantages, organize agricultural production and business along value chains, based on science, technology, and innovation, reducing greenhouse gas emissions and adapting to climate change."

On September 12, 2022, the Ministry of Agriculture and Rural Development issued the Ministry's action plan to implement the National Strategy on Green Growth for the period 2021-2030 [Decision No. 3444/QĐ-BNN-KH]. Decision No. 300/QĐ-TTg, dated March 28, 2023, issued the National Action Plan for the transformation of the food system to be transparent, responsible, and sustainable in Vietnam by 2030. Decision No. 1490/QĐ-TTg, dated November 27, 2023, approved the Project on Sustainable Development of One Million Hectares of High-Quality Rice Cultivation with Low Emissions Linked to Green Growth in the Mekong Delta by 2030. Green growth in economic sectors is promoted through the National Strategy on Green Growth for the period 2021-2030, with a vision to 2050 [Decision No. 1658/QĐ-TTg, 2021].

3.2.2. The Policy on Developing Green Agriculture in An Giang Province

In line with the government's policies and the Resolution No. 09-NQ/TU, dated June 27, 2012, issued by the Provincial Party Committee on "Developing High-Tech Agriculture in An Giang Province for the 2012-2020 period, with a vision towards 2030," this resolution clearly expresses the view and determination of An Giang Province towards producing high-quality and valuable agricultural products through the application of science and technology.

Decision No. 2163/QĐ-UBND, dated November 29, 2012, issued by the People's Committee of An Giang Province, on "Issuing the Plan for Developing High-Tech Agriculture in An Giang Province for the 2012-2020 period, with a vision towards 2030." This decision aims to establish and implement policies to encourage and attract high-tech agricultural enterprises, support the investment in the development of high-tech agricultural areas, and provide training, recruitment, and utilization of high-tech human resources in agriculture, as well as to support the development of research and high-tech processes in agriculture.

Resolution No. 40/2016/NQ-HĐND, dated December 9, 2016, on "Economic - Social Tasks for 2017" of the People's Council of An Giang Province at its 3rd session, term IX, and Resolution No. 40/2016/NQ-HĐND, dated December 9, 2017, "Regulations on Investment Support Policies for Agricultural Development in An Giang Province," which includes policies to support investment in cooperatives, cooperative unions, cooperative groups, business households,

families, and individuals engaged in the production and business of 08 agricultural product groups that are planned for high-tech applications in the province [rice, livestock, aquaculture, flowers – ornamental plants, edible mushrooms – medicinal mushrooms, vegetables, medicinal plants, and fruit trees].

Decision No. 271/QĐ-UBND, dated January 19, 2017, on "Issuing the Economic - Social Development Plan for 2017" of the People's Committee of An Giang Province, has directed agricultural production to be linked with environmental protection, climate change adaptation, the creation of safe products that meet market demand, and gradually transition agricultural production towards sustainable development, focusing on developing clean agricultural products with industrial scale production.

The above are important legal foundations guiding the development of green agriculture, high-tech agriculture, with a focus on the rational and sustainable use of resources, applying science and technology in production to create clean products, increase added value, and meet the needs of society. This is the future trend of green and sustainable agricultural development.

3.3. Current Status of Green Agriculture Development in An Giang Province

In recent years, An Giang province has been restructuring its agricultural sector towards increasing added value, promoting sustainable development, and encouraging the growth of organic agriculture, circular agriculture, and green agriculture. The province has focused on using organic fertilizers, reducing the use of chemicals and pesticides, applying technology to enhance production efficiency, conserving resources, protecting the ecological environment, and developing sustainable agriculture.

"The agricultural sector in the province is gradually developing modern agriculture, clean, sustainable organic farming, enhancing the quality, added value, and competitiveness of agricultural production through adjusting and shifting the structure of livestock, crops, forestry, and aquaculture. At the same time, it applies processes and technologies that ensure the efficient and sustainable use of seeds, feed, agricultural materials, and natural resources.. The agricultural production of the province is transitioning appropriately, creating added value for agricultural products and helping farmers benefit from selling carbon credits," said Nguyen Si Lam, Director of the Department of Agriculture and Rural Development [Thu Thao, Hanh Chau, 2024].

Implementing Green Agriculture Models in An Giang Province

An Giang province has implemented several green agriculture production models, focusing on integrated farming systems in rice cultivation, reducing environmental pollution, and increasing the yield and quality of rice. The province has established large-scale specialized rice farming

areas that meet the standards of various export markets [e.g., sticky rice, jasmine rice, Japanese rice]. The use of certified rice seeds and high-quality rice has been increased, along with the development of a value-added rice processing industry cluster. These efforts aim to stabilize and improve the quality of rice seed production areas in line with business requirements. The province is also building its own rice branding and product traceability through regional codes and product QR codes.

Some key projects in the rice cultivation sector in An Giang for the 2021-2025 period include: High-Tech Agricultural Zone in Cho Moi [1,114 hectares].; High-Tech Agricultural Zone in Chau Phu [960 hectares].; Organic Rice Production Complex in Tri Ton [605 hectares]. The province is focusing on consolidating nearly 20,600 hectares of land for the large-field farming model. Additionally, 24 effective production models have been developed, such as shrimp farming on rice fields in Thoai Son, and nearly 20 hectares of VietGAP and organic vegetable farming in Long Xuyen city. Other initiatives include straw mushroom cultivation and pangasius catfish farming on 336 hectares.

Developing Agricultural Economy on a Large Scale

An Giang province not only provides rice for the entire country but also exports rice in large quantities. To improve product quality, An Giang is participating in the implementation of the "Sustainable Development of 1 Million Hectares of High-Quality, Low-Emission Specialized Rice Fields Associated with Green Growth in the Mekong Delta Region by 2030" [referred to as the Project]. The goal of the Project is to establish 1 million hectares of high-quality, low-emission specialized rice fields, reorganizing the production system along the value chain, applying sustainable cultivation processes to increase value, develop the rice industry sustainably, enhance production efficiency, improve the income and living standards of rice farmers, protect the environment, adapt to climate change, and reduce greenhouse gas emissions.

To achieve this goal, in 2024, An Giang province aims to have 20,609 hectares of land under the Project's processes. So far, 8,536 hectares [41.4% of the planned area]. have been completed. The provincial agricultural sector has implemented 18 models, each covering 50 hectares, with a total area of 900 hectares across 9 districts, towns, and cities. Additionally, 4 models have been implemented thoroughly according to the criteria of the Ministry of Agriculture and Rural Development, covering 52 hectares in 4 districts: Phu Tan, Chau Thanh, Tri Ton, and Thoai Son. Phu Tan and Chau Phu districts have implemented 165 hectares under the Project's process.

The results of comparing the new models with traditional farming methods show positive outcomes. Specifically, there has been a 67kg/ha reduction in rice seed usage, an average yield increase of 0.1 tons/ha, a reduction in production costs of 4-5 million VND/ha, and a higher

profit margin of 3.66 million to 5.3 million VND/ha compared to traditional methods. In 2025, the agricultural sector in An Giang plans to implement 4,400 hectares across 11 districts, towns, and cities. To help farmers access and implement the Project's models in local areas, 47 models will be deployed across 526 hectares during the 2024-2025 winter-spring season. Notably, Phu Tan district will have 12 models covering 136 hectares, Tri Ton district will have 40 hectares of farmer-led expansion using cluster sowing machines, and Chau Phu district will implement 16 models on 80 hectares [aba.angiang.vn, 2025].

Application of Science and Technology and Transformation of Production Methods

An Giang province has implemented many agricultural production models applying science and technology, saying “no” to antibiotics and pesticides. These models not only improve farming and cultivation methods but also contribute to environmental protection and aim for a safe agricultural system that provides high-quality products for consumers. The models of flower cultivation on rice field banks have been carried out to build large-scale, sustainable commodity production areas, ensuring food safety and environmental protection. The province is expanding the area of safe vegetable production in various districts, towns, and cities through training activities and practical implementation. Additionally, low-cost net house models, organic vegetable production, and advanced farming techniques with environmentally friendly and high-yield processes are being scaled up.

Some notable projects include: The project of producing and processing vegetables, tubers, and fruits in greenhouses meeting VietGAP standards [2018–2020]. by Phan Nam Trade and Service Co., Ltd. The high-tech agricultural project 7 Nui An Giang. The project of farming special ornamental fish using high-tech by Mekong Fisheries Agricultural Service Cooperative [Mekong Coop]. The experimental project on growing Golden Emerald melon in greenhouses using drip irrigation techniques by Cafe Phó Farm in An Phu district. The project of industrial tissue-cultured banana farming for export by Green Vietnam Agricultural Export-Import Co., Ltd. The project of expanding melon cultivation in greenhouses using drip irrigation techniques by DH Farm. The clean straw mushroom cultivation project using high-tech by Phuc Anh Co., Ltd.

Additionally, An Giang is also producing and trading in eight groups of agricultural products under high-tech application, including: rice, livestock and poultry farming, aquaculture, flowers and ornamental plants, edible mushrooms and medicinal mushrooms, vegetables, fruit trees, and medicinal plants. At the same time, products and services supporting the development of high-tech agriculture are also being given special attention in the province. The province has implemented a comprehensive set of resolutions, programs, projects, plans, and development orientations towards "Sustainable, transparent, and responsible agriculture." The province is shifting the mindset of agricultural production to an agricultural economy mindset, from

developing single industries to multi-sector cooperation, promoting the integration of multiple values in agriculture, forestry, and fisheries products, transitioning from a supply chain of agricultural products to developing industry chains.

Organic Ecological Models and Environmental Protection

Organic Ecological Models: The Center for Rural Research and Development at An Giang University has focused on studies to build farming models aimed at developing agriculture in an ecological and organic direction. Many studies have been conducted on issues such as socio-economic factors, ecology, environment, reducing fertilizers, and pesticides. **Pesticide-Free Rice Production Model:** In districts like An Phu, An Giang, a rice production model has long been established that avoids the use of pesticides, aiming to protect the ecological environment and public health. This is considered a green agriculture model, completely free of pesticide use.

The province strictly prohibits activities that cause water pollution, including: discharging harmful chemicals, waste, animal carcasses, bottles, pesticide containers; wastewater from industrial production facilities or industrial zones, wastewater from aquaculture production areas, and domestic wastewater from residential areas and business zones into irrigation systems. Actions such as encroaching on riverbanks, obstructing flood drainage, and altering the flow of rivers leading to local erosion in front and behind irrigation works are also prohibited.

Agricultural Economy Development and Digital Transformation in 2025: By 2025, An Giang's agricultural economy will continue to develop in a modern, sustainable direction with reasonable growth, large-scale commodity production based on the restructuring of the sector. At the same time, the province will innovate the growth model to deepen, increasing the intellectual capital and competitiveness of agricultural products, enhancing the value of farming and the income of farmers. Based on the results achieved, the agricultural sector will continue to implement the goals for 2025, including: an overall growth rate of around 4.8%; an additional 6 communes meeting new rural standards, 2 communes meeting advanced new rural standards, and 1 commune meeting model new rural standards; 2 districts meeting new rural standards; 96.5% of the rural population will have access to clean, hygienic water; maintaining a stable forest cover rate of 3.5% in concentrated planted forests and improving the quality of forests.

The province has also focused on digital transformation, the application of high technology, green production, and sustainable consumption. The expansion of specialized areas for rice, vegetables, and fruit trees in closed value chains from production to consumption is a priority.

Mechanization, Traceability, and International Food Safety Standards: Alongside this, An Giang is intensifying mechanization, traceability, and the issuance of planting area codes, while applying international food safety standards. Communication and community mobilization

efforts aim at promoting a green lifestyle, resource conservation, and environmental protection. Green agriculture development is considered a key focus in building new rural areas, contributing to the realization of the goal of developing a green economy, carbon neutrality, and harmonizing economic, social, and environmental development for sustainable benefits for future generations. Green agriculture will truly have long-term effectiveness when farmers themselves consciously recognize that the new system they are working under is either beneficial or detrimental to the environment they live in, as opposed to merely following a system they must comply with [Khuat Dang Long, 2016, p.7].

Limitations in the Development of Green Agriculture in An Giang Province

Despite the achievements made in the development of green agriculture, An Giang Province is facing many difficulties both in production conditions and organizational implementation.

Firstly, the level of knowledge, awareness, and farming habits of farmers remain limited. Many households still focus on yield and are reluctant to change their farming techniques. The small-scale nature of production makes it difficult to organize concentrated models, apply uniform techniques, and link with businesses. The management of pests without chemicals is also difficult to implement without technical support and synchronization.

In addition, the long time required to establish clean production models and the difficulty in building consumer trust in clean products slow down the transition process. The connection with the market and businesses remains weak, while the infrastructure, capital, and human resources of cooperatives and agricultural enterprises are still insufficient. Climate change is increasingly complex, with droughts, saline and acid soil contamination, and pest outbreaks.. All these factors are hindering An Giang in its transition to a green, sustainable, and high-value agricultural system.

4. Discussion and Conclusion

The development of green agriculture in An Giang Province is an inevitable trend to ensure sustainable production, enhance value-added, protect the environment, and safeguard public health. With its advantages in natural conditions and diverse agricultural ecosystems, An Giang has great potential to transition to a green agricultural model. However, this process faces many barriers, mainly stemming from limited awareness among farmers, small-scale production, difficulties in managing biological pests, lack of connection with businesses and the market, and a lack of solid consumer trust.

To promote green agricultural development, An Giang needs to implement a comprehensive set of solutions:

- Enhance training and communication to raise awareness and improve green farming skills for the people;
- Strengthen production linkages through cooperatives and farming groups to overcome the fragmentation of land holdings;
- Provide technical and financial support for ecological models, technology application in pest management, and clean production;
- Encourage businesses to participate in building raw material regions and stable consumption chains;
- Develop branding and traceability to build consumer trust.

The government plays a key role in policymaking and regulation; scientists provide technical solutions; businesses lead the market; and the people are at the center of the transformation. All must work together closely for green agriculture to become a reality in An Giang.

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