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Green Agriculture in Vietnam: The key to Sustainable Development

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Abstract

Green agriculture is production agriculture that applies synchronous processes and technologies, uses reasonable technology, saves input materials for production, and effectively uses natural resources. Green agriculture aims to improve the competitiveness of agricultural products, develop technology to process and reuse by-products and waste, stabilize the economy, help farmers have a better quality of life, and protect resources and agricultural ecosystems... ensuring sustainable agriculture on both socio-economic and environmental pillars, contributing to green economic development. Nearly 80% of the population participates in production. Agriculture is not only an industry strongly affected by climate change but also an industry that causes huge greenhouse gas emissions. With

the responsibility of reducing emissions to contribute to mitigating global climate change, towards a green economy, Vietnamese agriculture is gradually transforming its production model to meet the trend of green growth and green consumption. Green agriculture has emerged as a practical and necessary trend in a context where the environment is facing many serious challenges. With the combination of agricultural development and environmental protection, green agriculture brings a new approach, creating great benefits for both humans and the ecosystem. The author wrote an article about Green Agriculture to review Vietnam's efforts to bring agriculture towards new market flows.

Keywords: Green Agriculture, Green Growth, Sustainable Development

1. Introduction

At the 26th Conference of Parties to the United Nations Framework Convention on Climate Change (COP26), Vietnam made a very strong commitment to the international community to bring net emissions to "zero". In 2050.

Efforts to build a green economy, reduce emissions as well as implement commitments, the Prime Minister has issued many strategies such as: National strategy on climate change for the period up to 2050; National strategy on green growth for the period 2021 - 2030, vision to 2050; Strategy for sustainable agricultural and rural development for the period 2021 - 2030 with a vision to 2050... All aim to promote environmentally friendly, low-carbon agriculture, adaptive to climate change.

However, there are still old problems, habits and thinking in production that have not been eliminated such as: excessive use of inorganic fertilizers, pesticides, drug abuse in animal husbandry and veterinary medicine. - aquatic products, diseases, environmental pollution, food hygiene and safety,... are increasingly becoming serious problems, seriously affecting human health, the ecological environment and the reputation of our products. Vietnam in the international market.

Green growth and a clean, safe agriculture are identified as an inevitable trend in production in general and agricultural production in particular. On October 1, 2021, the Prime Minister approved the National Strategy on Green Growth for the period 2021-2030, vision 2050, this is an important milestone for the new era of "green development" that is taking place. Is set.

In this inevitable trend, there must be close coordination between people, businesses, the state and scientists. It is necessary to pay attention to science, technology and innovation, especially exact science, research rooms, and modern, specialized laboratories to be able to analyze and accurately detect the causes to solve the problem. Provide the most effective and economical solutions for people.

2. Theoretical basis

Green agriculture concept

The Organization for Economic Cooperation and Development (OECD, 2010) believes that: Green agriculture is a way to develop the agricultural sector, which maximizes opportunities to exploit clean resources, leading to an agricultural model. Sustainable growth is more closely linked to environmental protection. Green agriculture or more specifically, organic agriculture that ensures 4 principles: Health, ecology, fairness, and caution is gradually becoming a new direction to build a civilized agriculture that adapts to climate change. Queen [6].

In Vietnam, the Government issued Decree No. 109/2018/ND-CP dated August 29, 2018 on organic agriculture to support businesses, cooperatives, farms, households, and producer groups. Organic products [1]. By 2020, the Organic Agriculture Development Project for the period 2020-2030 was approved in Decision No. 885/QD-TTg dated June 23, 2020 of the Prime Minister. [2]. The project is built on the basis of the actual practices, methods and general orientation of the Agriculture Sector Restructuring Project towards enhancing added value and sustainable development. This is also the consistent direction of the Central Government, the Government and the Prime Minister in recent years and the agricultural sector has been actively implementing this policy. In addition, organic agriculture is a growing trend and will grow rapidly in the near future, due to ensuring the supply of better products for human health and society.

Benefits of green agriculture

Not only in countries around the world but also in Vietnam, climate change is increasingly unpredictable and pollution is increasingly severe. Therefore, green agriculture is increasingly focused on because of the benefits it brings:

First, green agriculture helps reduce emissions and impacts of toxic chemicals. Not using toxic chemicals not only ensures food hygiene and safety but also helps protect the soil ecosystem.

Second, green agriculture helps protect the environment and human health. When products containing toxic chemicals are not used, the environment is clean and human health will gradually improve.

Third, green agriculture creates clean, safe products that meet requirements during use. If in the past people had to consume green vegetables sprayed with growth stimulants and meat raised to increase weight, now such products are not produced.

Fourth, the ecosystem is balanced and biodiversity is maintained: limiting the use of chemicals will help stabilize beneficial microorganisms in the soil, making plants grow in a more natural direction.

Limitations when applying green agriculture

Firstly, green agriculture has not been popularized and widely applied, so many farmers are still struggling to learn but have not been able to apply it.

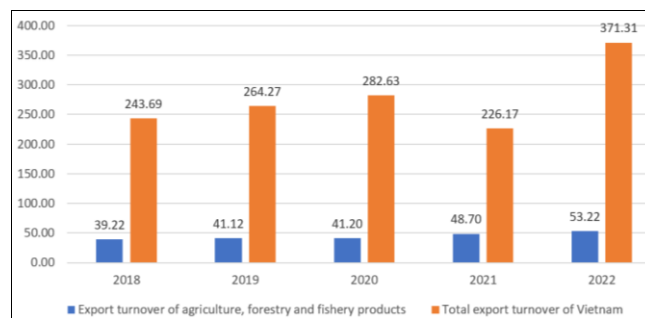
Second, it takes more time and effort than the conventional method, but thanks to that, quality will also be more guaranteed.

Third, the cost of products produced from green agricultural models is higher than conventional products.

3. Current status of green agricultural development in Vietnam

3.1 General situation of agricultural export in Vietnam in the period 2018-2022

International economic integration has helped Vietnam's agricultural sector successfully participate in the global value chain. Vietnam has become an important link in the global agricultural value chain, among the 15 largest agricultural exporting countries in the world and ranked 2nd in Southeast Asia. Vietnam's agricultural exports continue to grow, contributing to improving the trade balance.



Source: General Statistics Office [3]

Fig 1: Export turnover of agriculture, forestry and fisheries in the period 2018-2022

The export value of agriculture, forestry and fishery products reaches 48.7 billion USD in 2021 and 53.22 billion USD in 2022. Vietnam has 11 product groups with export turnover of over 1 billion USD, including 7 export items reached over 3 billion USD (including wood and forest products reaching 17 billion USD; shrimp 4.3 billion USD; coffee 4 billion USD; rice 3.5 billion USD; rubber 3.3 billion USD; vegetables and fruits 3.3 billion USD; cashew nuts 3.1 billion USD). Export products are increasingly diverse, focusing on improving quality, increasing processing content and increasing value. Preliminary and processed products account for about 50% of Vietnam's total agricultural, forestry and fishery export turnover, of which pepper and cashew exports rank first, cassava and cassava products rank second, and rice ranks third. And coffee ranks fifth in the world.

In the export structure in 2022, seafood export turnover accounts for an increased proportion compared to previous years. In particular, shrimp and pangasius products have high consumer demand and increased selling prices, while fertilizer, animal feed, and raw materials also reached a turnover of over 1 billion USD for the first time.

3.2 Current status of green agriculture implementation in Vietnam

Green agriculture in Vietnam has made great strides in development. However, in reality there are still some "bottlenecks" that need to be removed, which are: there are no plans for organic production or separate policies to support organic production; There are not many organizations testing and certifying organic production "made in Vietnam", most of the certification work must be hired by foreign organizations with high fees; Agriculture still operates on a small-scale basis, so applying closed, large-scale production forms of green agriculture is quite difficult; Consumers do not really trust and do not have

experience distinguishing between organically produced products and other conventional products; Human resources skilled in organic agricultural production are still limited compared to demand; There are no key programs and adequate resource investment to create green agricultural breakthroughs.

One of the farming methods of green agriculture is organic agricultural production. According to statistics from the Ministry of Agriculture and Rural Development, the area of organic farming in our country has increased from 53,350 hectares in 2018 to about 237,693 hectares in 2022; 46/63 provinces and cities are implementing and launching the organic production movement; The number of farmers participating in organic production is 17,168 people; The number of organic production enterprises is 127; Participating in export are 60 enterprises with a turnover of about 335 million USD/year.

In recent years, Vietnamese agriculture has continuously grown and achieved great achievements, although in the context of being heavily affected by the Covid epidemic, by the end of 2022, the export turnover of agricultural, forestry and fishery products The entire industry reached a record figure of 53.22 billion USD, an increase of 9.3% compared to 2021; trade surplus of over 8.5 billion USD. These achievements are the most concrete proof of the efforts of the political system, businesses, cooperatives, farmers and society.

An investigation by the International Agricultural Organization (2020) stated that Vietnamese organic agricultural products are consumed domestically and exported to 180 countries around the world, including: the US, the European Union, and China. China, Japan, Germany, England, Korea, Russia, Singapore, France, Belgium, Netherlands, Italy...^[4]. In particular, in recent times, many advanced farming models have appeared across the country, applying modern techniques and technology, standard and environmentally friendly farming processes. For example, the organic vegetable model in Quang Nam, typically the "Kapi Tropical Garden" project of Ms. Bui Thi Thanh Suong in Dien Ngoc, Dien Ban with an area of more than 1,000 square meters using the hydroponic method, has been occupying Gaining customer trust because of products that are safe for consumers' health. In addition, Ms. Suong is also researching a model combining clean agriculture with ecotourism. Some southern provinces are also actively developing organic agricultural production models to provide importers with organic products serving the European, North American and Japanese markets. It can be mentioned that Ca Mau province has implemented an organic aquaculture project combined with mangrove conservation; An Giang province has developed a plan to raise organic pangasius to help farmers increase profits by 15% compared to traditional fish farming.

The 2021-2022 Winter-Spring crop continues to show a clear shift in awareness and changes in farmers' long-standing farming practices. Many localities, businesses, and cooperatives have raised awareness for farmers in reducing the amount of seeds sown, managing IPM pests, using pesticides according to the "4 rights", and reducing the amount of fertilizer. inorganic, coupled with many technical advances such as "3 reductions 3 increases", "1 right 5 reductions", shallow irrigation - exposure - drying techniques... These synchronous technical solutions and processes have been and is bringing many practical benefits,

helping to reduce production costs and reduce environmental pollution. Studies have shown that the longer rice fields are flooded, the more methane is produced. Rice fields are applied shallow irrigation - exposure - drying technique, which helps reduce greenhouse gas emissions by about 3.5 times compared to rice fields that are flooded throughout the season.

Or the rice - shrimp, rice - fish model not only increases production value, but also helps solve the problem of reducing greenhouse gas emissions and building green agriculture. This is one of the typical models in adapting to climate change in the Mekong Delta region. Not only do they have specialty, high-value products, producers also sell the humane values of the Mekong Delta people in rice farming. Meanwhile, in the world market, many countries have encouraged and prioritized the import of ecological and organic products. EU consumers are willing to pay high prices for sustainable agricultural products.

In livestock farming, waste treatment and utilization of agricultural by-products by building a circular economy are being applied on different scales. Along with biogas plants, the livestock industry is promoting guidance for farmers to collect livestock waste to raise earthworms, black soldier flies, etc. to create protein sources for livestock food in the context of food prices. Livestock production has increased, converting waste into organic fertilizer, reducing harm to the environment. Typically, in cow farming of T&T 159 Hoa Binh Joint Stock Company, to create a food source, the unit purchases all agricultural by-products: corn stalks, straw, peanuts, etc. produced as animal feed. Utilize waste products from the wood production industry such as chips, shavings, sawdust, etc. to produce biological mattresses. The food for microorganisms in biological cushions is cow waste. This conversion will help keep the barn odor-free and always clean. In particular, organic fertilizer factories will recycle these biological cushions. Fertilizer has been a significant source of income for businesses.

Also, with the trend of taking advantage of and exploiting the full value of an agricultural product instead of exploiting only one economic aspect of the product, the way to produce the product, business process of forming the product through integration. Tourism is helping farmers increase their income. Developing agriculture associated with tourism is also a direction in green agricultural development that many localities are exploring. Farms can be linked with surrounding traditional craft villages on the basis of historical and cultural research, creating green, clean and safe agricultural products of the region to attract and serve tourists. Connections within and outside the region through the tourist market to find output for specialty and endemic agricultural products such as herbs, milk, tea, clean vegetables,... Many regions, 50% Farmers' income comes from services such as homestay rental, sightseeing, experiencing farm work...

3.3 Limitations to the development of green agriculture in Vietnam

Vietnam's agriculture has made remarkable progress from 1986 to present. The strong development of the agricultural sector has helped Vietnam significantly improve food security, contribute to poverty reduction, socio-economic stability and become one of the world's top 5 agricultural exporters. However, Vietnam's current agricultural growth model still reveals many worrying things about quality and

sustainability. In particular, current growth in the Agriculture sector is partly due to environmental sacrifices. Therefore, green agriculture is considered the main agricultural development model in the future. However, for Vietnamese agriculture to approach green agriculture, there is still a long distance and many "bottlenecks". Specifically:

First, Vietnamese agriculture is still based on small-scale household scale, making it difficult to apply closed, large-scale production forms of green agriculture

If green agriculture is to be successful, it must be based on a large cultivated area to effectively utilize science and technology applications, so the requirement for land accumulation is a very necessary job. Practice shows that the Government has set the goal of reducing land fragmentation through the program of land consolidation and land exchange, encouraging farmer households to exchange fields with each other to have continuous plots and join cooperation. Communes or farming households can lease land to businesses. However, in most localities in the country, the agricultural land rental market is still underdeveloped, due to limitations in field size, low value of rented agricultural land, high transaction costs and the provincial government's land valuation work still has many problems and problems.

Currently, Vietnam has 8.6 million farming households with nearly 70 million small fields - it is a huge challenge to reorganize a large, centralized production. This is the basic reason why our country's biological productivity is very high, but the economic efficiency for producers is very low. The average cultivated area per agricultural worker in Vietnam is only 0.34 hectares, only about half (0.6 - 0.8 times) compared to Cambodia, Myanmar or the Philippines (World Bank, 2017) ^[5]. The land fragmentation situation is a significant obstacle to the process of modernizing the agricultural sector and moving towards green agriculture in the future in our country.

Second, environmental factors and climate change are major barriers in the process of greening the agricultural sector

It can be seen that an important highlight in green agriculture is awareness of the role of the environment in agricultural production. Agricultural pollution generally receives little attention. The scarcity of data on agricultural pollution has limited researchers' ability to study its effects on human and animal health, biodiversity, and agricultural profitability. Agriculture and other industries and the total social value of agricultural production. An estimated 80 million tons of livestock waste generated each year contain nutrients, pathogens, and volatile compounds that affect water and air quality and damage soil (World Bank, 2017) ^[5]. Along with that, Vietnam is one of the 5 countries most heavily affected by climate change due to its long coastline and many large river basins, of which the Red River Delta and Mekong Delta are affected. Suffer the most. Therefore, to limit the negative impacts of climate change and other environmental issues, there needs to be drastic action from the Government through policies and commitments; join hands of businesses through innovating environmentally friendly production technology and the actions of each individual to change their thinking and agricultural production habits to minimize negative impacts.

Third, the level of science and technology in the agricultural sector in Vietnam is still quite rudimentary, the cost of buying new technology is too high.

Applying high technology in agricultural production requires large initial costs, while the investment capacity of economic sectors in agriculture in Vietnam is still limited. Enterprises in the agricultural sector are mainly small and micro, and the ability to modernize equipment for green agriculture is extremely difficult.

Vietnam is lacking connection infrastructure and information infrastructure in agriculture and rural areas. Information on input costs and output prices still depends heavily on traders, and there is no official transmission channel from policymakers and management agencies to farmers in accessing them. World markets and limit risks in the process of adapting to peripheral changes to agricultural production activities.

Fourth, lack of financial resources for green agricultural development.

Vietnam's financial market has expanded rapidly since the early 1990s but there is still much work to be done to play a larger role in the economy. The majority of loans, especially from state-owned commercial banks, are given to state-owned enterprises or private enterprises with close relationships, crowding out credit sources for businesses operating effectively in the country. Domestic private sector. Financial coverage has increased but remains a problem for the disadvantaged, especially in rural areas. Lack of a modern and well-functioning financial sector is a handicap in pursuing green growth in agriculture.

4. Solutions to develop green agriculture in Vietnam

To remove the "bottlenecks" in the process of developing Vietnam's agriculture towards green agriculture, towards long-term and sustainable development, the solutions that need to be implemented include:

Firstly, for land

Land consolidation and market-oriented land use are important to promote mechanization and crop diversification, thereby leading to increased productivity. Create favorable conditions for agricultural businesses and investors by expanding land use limits, allowing more land accumulation, and allowing conversion of agricultural land use purposes in a more open and flexible manner; Research other association models in agriculture in addition to reorganizing current cooperative models so that farmers can associate themselves and invest in developing high-tech agriculture.

Second, for climate change and environmental pollution

With increasing awareness of the impact of climate change on the implementation of short-term and long-term goals in agricultural development, Vietnam and businesses need to shift to climate-smart agriculture. According to the definition of the Food and Agriculture Organization of the United Nations, climate-smart agriculture "aims at supporting countries to devise the necessary policies, technical and financial tools to integrate climate change issues. Climate change into the agricultural sector, creating a basis for implementing sustainable agricultural development in the new situation" (FAO, 2013) ^[7].

Third, about science, technology and financial resources in green agricultural development

Vietnamese agriculture is at a turning point where some traditional growth drivers are gradually weakening (such as

resources and land), while new drivers have not been fully formed (science and technology). Therefore, mastering science and technology is the key point to help Vietnamese agriculture make a breakthrough and approach green agriculture. The state needs to play a "leading" role in refinancing and supporting businesses in accessing credit to invest in science and technology in agriculture. In addition, it is necessary to promote the reorganization of production according to linked chains, with businesses being the nucleus of links, organizing production with farmer households, farms, and cooperatives to apply high technology in production and production. Managing the production cycle of goods and traceability.

5. Conclusion

Producing green agriculture and ecological agriculture by synchronously applying processes and technology, using rationally and saving input materials for agricultural production, and effectively using natural resources, does not affect the environment or human health. To do that, there needs to be a combination of all actors in the economy in implementing land reclamation, being deeply aware of climate change and environmental pollution, applying science and technology and strengthen financial resources in green agricultural development.

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