DEVELOPMENT OF HIGH-TECH AGRICULTURE (2011 – 2020) - SOME RESULTS AND EXPERIENCES

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ABSTRACT

Recognizing the position and role of high-tech agriculture, the Communist Party of Vietnam has determined many policies and measures to develop this field, considering this a key content of the process of industrialization and modernization of agriculture and rural areas from 2011 to 2020. During this time, the Party's leadership in the development of high-tech agriculture has achieved many important results, contributing to the restructuring of Vietnam's agriculture towards modernity, efficiency and sustainability. Besides, the process of the Party leading this content still has some limitations. By historical and logical methods, combined with statistical and comparative methods, the article has analyzed the Party's policy and the results achieved in the process of developing hi-tech agriculture from 2011 to 2020. The research results confirm the correctness and creativity in the Party's policy on developing high-tech agriculture. At the same time, it draws on some experiences to continue developing hi-tech agriculture in the coming time.

PHÁT TRIỂN NÔNG NGHIỆP ỨNG DỤNG CÔNG NGHỆ CAO (2011 – 2020) – MỘT SỐ KẾT QUẢ VÀ KINH NGHIỆM

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TỪ KHÓA

Đảng Cộng sản Việt Nam
Công nghệ cao
Nông nghiệp ứng dụng công nghệ cao
Kết quả
Kinh nghiệm

TÓM TẮT

Nhận thức được vị trí, vai trò của nông nghiệp ứng dụng công nghệ cao, từ năm 2011 đến năm 2020, Đảng Cộng sản Việt Nam đã xác định nhiều chủ trương, biện pháp phát triển lĩnh vực này, coi đây là nội dung then chốt của quá trình công nghiệp hóa, hiện đại hóa nông nghiệp, nông thôn. Quá trình Đảng lãnh đạo phát triển nông nghiệp ứng dụng công nghệ cao trong thời gian này đã đạt được nhiều kết quả quan trọng, góp phần tái cơ cấu nông nghiệp Việt Nam theo hướng hiện đại, hiệu quả, bền vững. Bên cạnh đó, quá trình Đảng lãnh đạo nội dung này vẫn còn có một số hạn chế. Bằng phương pháp lịch sử và phương pháp lôgic, kết hợp với phương pháp tổng hợp, thống kê, so sánh, bài viết phân tích chủ trương của Đảng và kết quả đạt được trong quá trình Đảng lãnh đạo phát triển nông nghiệp ứng dụng công nghệ cao từ năm 2011 đến năm 2020. Kết quả nghiên cứu khẳng định tính đúng đắn, sáng tạo trong chủ trương của Đảng về phát triển nông nghiệp ứng dụng công nghệ cao; đồng thời, đúc rút một số kinh nghiệm để tiếp tục phát triển nông nghiệp ứng dụng công nghệ cao trong thời gian tới.

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1. Introduction

Vietnam is a country with many advantages in terms of nature and society for comprehensive agricultural development. However, due to the development of the Industrial Revolution 4.0, the negative impacts of climate change and the process of land and labor displacement in the process of accelerating industrialization and modernization, the advantages mentioned above will gradually weaken if the leader does not determine the appropriate development path. Recognizing the above requirements, from 2011 to 2020, the Communist Party of Vietnam has focused on leading the development of high-tech agriculture. Many new guidelines have been identified; many breakthrough policies have been issued and implemented. Thereby, agriculture has made progress, really supporting the economy, especially in the face of complicated developments of the world and regional situation during this period. Vietnamese agricultural products not only stop at the domestic market but also participate more and more deeply in the global value chain. However, high-tech agriculture still has some limitations and problems that need to be overcome. The 13th National Congress of Delegates (2021) affirmed to continue to restructure agriculture, develop agriculture and rural economy in association with building new rural areas in the direction of ecological agriculture and modern rural areas, civilized farmers. In particular, the development of large-scale concentrated commodity agriculture in the direction of modernity and application of high technology is the key content and measure to successfully implement *The Strategy for Sustainable Agriculture and Rural Development*. Therefore, it is necessary to study the results and draw experiences on the process of the Party leading the development of high-tech agriculture from 2011 to 2020 in order to apply it to the construction and development of digital agriculture.

In the past time, there have been a few typical research projects on development of high-tech agriculture. On the basis of a general assessment of achievements and limitations in the development of hi-tech agriculture, Tran Thanh Quang [1] proposed solutions to overcome difficulties in capital, human resources, land and consumer markets. Hoang Ngoc Hoa [2] affirmed that the development of hi-tech agriculture is the central and key content of agricultural restructuring. The author proposes that the State must play a good role in creating and supporting a favorable environment to promote economic sectors to develop hi-tech agriculture. Nguyen Quang Nam [3] has initially drawn some experiences from the process of Lam Dong Provincial Party Committee leading the development of hi-tech agriculture. Nguyen Thi Mien [4] has evaluated some initial results on the development of hi-tech agriculture in Vietnam. At the same time, she proposed some solutions to develop hi-tech agriculture in Vietnam in the coming time. Nguyen Xuan Cuong [5] stated that sustainable high-tech agricultural development was a necessary requirement to meet the new requirements of international economic integration and the impacts of climate change. According to the author, in order to develop hi-tech agriculture, it is necessary to strengthen information and propaganda; continue to improve policies to encourage association, cooperation and investment attraction. Vu Thi Thu Huong [6] suggested that in order to promote the development of high-tech agriculture, the State should increase investment resources to promote national agricultural advantages. On the basis of affirming the objective requirements of developing high-tech agriculture in the context of the Fourth Industrial Revolution, Tran Hoa Phuong [7] has proposed groups of solutions, namely, agricultural master plan, perfecting the policy on land, and human resource training.

Thus, the works have confirmed the objective requirements of developing high-tech agriculture in Vietnam today. A few works have initially assessed the results and limitations of high-tech agricultural development in our country in recent times. On that basis, a number of works have proposed solutions to develop this field. However, there is no work that systematically presents the advantages and limitations of the Party and State's policy planning and practical direction on development of high-tech agriculture. Therefore, this article analyzes the results, limitations and draw historical experiences from the process of the Party leading the

development of high-tech agriculture from 2011 to 2020; thereby, it proposes the direction of applying experiences to develop high-tech agriculture in the coming time.

2. Research methods

This article used historical and logical methods to clarify the advantages and limitations in the process of leading the development of high-tech agriculture (2011 - 2020). In addition, statistical methods were used to clarify the results achieved in the development of high-tech agriculture under the leadership of the Party; the comparative method was used to see the development of high-tech agriculture compared to the previous period.

3. Results and discussion

3.1. Results of hi-tech agriculture development (2011 - 2020)

3.1.1. Advantages

Firstly, a system of hi-tech agricultural parks, areas and enterprises had been established nationwide.

Before 2011, Vietnam did not have a hi-tech agricultural park to fully perform the tasks specified in the Law on High Technology 2008. By 2020, 4 agricultural parks with technology application had been established to attract investment in agricultural production, as a focal point for the connection between scientists and producers, and to link the chain from research to application to production as well as link scientific products, commodity products with the market. In addition, 124 hi-tech agricultural production parks had been established in socio-economic regions by 2020 [8, p.48]. High-tech agricultural production parks had grown in number, scale and level.

Developing high-tech agricultural areas is one of the important tasks in the High-tech Agricultural Development Program. By 2020, 12 high-tech agricultural areas had been recognized by the provincial People's Committees with a total area of 18,089 hectares. In addition, the whole country had formed 690 specialized and large-scale production areas with high-tech applications, which were widely distributed across socio-economic regions [8, p.25].

From 2011 to 2020, the agricultural sector had attracted more and more large enterprises to invest on a large scale. The number of enterprises in the agricultural sector increased by nearly 3.1 times, from 3,517 enterprises (in 2011) to 10,766 enterprises (in 2020). Most large corporations investing in agriculture applied modern technological processes, initially creating spillover effects in agricultural production. By 2020, there had been 290 agricultural enterprises applying high technology to production. In particular, there were 68 enterprises that met the criteria specified in the Law on High Technology and the Prime Minister's Decision 19/2018/QD-TTg, which were recognized by the Ministry of Agriculture and Rural Development and the People's Committees of the provinces and cities [8, p.39].

Secondly, new technologies had been researched and applied to agricultural production, which had contributed to improving productivity and quality of livestock and plants.

Biotechnology had been researched and applied in the selection and creation of high-yield, good-quality, and resistant varieties of plants and animals, contributing to improving the value of Vietnamese agricultural products. In the field of crop production, in the period 2011 - 2020, the whole country researched 428 plant varieties that had been recognized by the Ministry of Agriculture and Rural Development as new varieties for trial production, of which 97 were officially recognized [8, p.49]. In animal husbandry, thanks to the application of advanced hybrid technology, many breeds of cattle and poultry had been bred for high productivity and quality. Breeding technology in the fisheries sector had also achieved many results.

The application of information technology, automatic and semi-automatic technology in farming had brought positive results, contributing to the modernization of farming techniques. The technology of growing plants in greenhouses had been increasingly developed. By 2020, the

whole country had about 6,000 hectares of greenhouses. Economical irrigation technology had been applied more and more popularly, helping to reduce labor and save water resources, adapting to climate change. By 2020, the total area of crops irrigated with advanced and water-saving irrigation in the whole country had reached 276,000 ha, accounting for 5% of the country's cultivated area, an increase of more than 3 times compared to the time of agricultural restructuring (2013) [8, pp.50- 51].

Thirdly, agricultural human resources developed in both quantity and quality, meeting the requirements of restructuring the agriculture towards sustainability and application of high technology.

The Party and State had implemented human resource development through many programs, schemes and plans. By 2020, 2.3 million rural workers had been trained in agriculture. Implementing the agricultural extension program, from 2011 to 2020, there were over 9,000 turns of agricultural extension officers trained in vocational skills [8, p.71]. The Ministry of Agriculture and Rural Development had 34 institutions (1 academy, 3 universities, 2 schools of administrators, 28 colleges) and 8 scientific research institutes with postgraduate training. Universities and institutes had 373 training professions. In particular, the university level had 88 majors, the college level had 112 majors, with the proportion of the agriculture sector being 35.2% and 42.8% respectively [8, p.72].

Fourthly, science and technology had made an important contribution to restructuring the agricultural sector towards modernity, sustainability and efficiency.

By 2020, science and technology had contributed 30% of the total value added in agriculture. Vietnam's agricultural production structure has changed positively on the basis of promoting the potential and advantages of the regions, market demand, adapting to climate change and ensuring food security. The growth rate in agriculture in the period 2011 - 2015 reached 3.13%/year [9, p.9]. In the 2016-2020 period, despite being affected by climate change and market fluctuations due to the Covid-19 pandemic, Vietnam's agriculture still maintained an average growth rate of 2.71%/year [10, p.11]. Thereby, agriculture has affirmed its role as a pedestal, contributing to stabilizing people's lives in difficult times.

Fifthly, the application of high technology to agriculture had created great resources, contributing to the realization of the goal of building a new countryside.

The development of high technology agriculture had achieved many important and pervasive results in socio-economic fields, creating great resources to realize the goal of building a new countryside in each locality. New rural construction was completed nearly 2 years earlier than planned. By 2019, more than 4,800 communes had met the new rural standard, accounting for 54% of the total number of communes. There had been 5,506 communes (accounting for over 62% of communes meeting new rural standards) and 173 districts meeting new rural standards by 2020 [11, p.23].

3.1.2. Limitations

Firstly, the construction of hi-tech agricultural parks, areas and enterprises had not been achieved according to the set plan.

About the high-tech agricultural zone: By 2020, Vietnam had built 4 hi-tech agricultural parks, reaching 36.4% of the plan. They only focused on the production function but had not yet performed the function of research, technology demonstration, and training of high-quality human resources. Therefore, these parks had not yet promoted their nuclear role and had not had a strong spillover effect to develop high-tech agriculture..

About high-tech agricultural areas: According to Decision No. 575/QD-TTg, 66 high-tech agricultural areas have been planned by 2020. However, the People's Committees of the provinces had just signed decisions to build 12 high-tech agricultural areas by 2020. This number had reached 18.2% of the plan.

About high-tech agricultural enterprises: The program had set a target by 2020 to establish about 200 enterprises applying high technology. However, there had been only 68 enterprises recognized by the Ministry of Agriculture and Rural Development and the People's Committees of provinces and cities by 2020. This number had reached 34% of the plan.

Secondly, research and application of science and technology in production was still small, lacking in synchronization; technology level was still low.

The research and application of high technology in agricultural production in Vietnam in the years 2011 - 2020 was on a small scale, mainly at household scale and farms using less labor. The work of selection and breeding was still slow to develop. Sources of plant and animal seeds had depended on imports. Research on high-quality plants and seeds and attracting private economic sectors to invest in research, selection, breeding and production of plant and animal breeds in Vietnam had not really met the demand.

The level of technology applied in production was still low. Machines and equipment applied to agricultural production in Vietnam were still outdated and inconsistent. According to The Summary Report of the Science and Technology Strategy for the Agriculture and Rural Development Sector in the 2013-2020 period, the application of science and technology had not been widespread and synchronous in most of the stages; agro-processing industry and industry-agricultural support services had not yet attracted enterprises to invest in and innovate technology [12, pp.5-6]. In addition, the application of high technology in many other fields such as electrification, chemistry, and computerization was still at a low level and lacked synchronization, failing to meet the needs of agricultural modernization.

Thirdly, human resources in agriculture were still lacking and weak.

In the period of 2011 - 2020, human resources for management, production and agribusiness were still lacking and weak, with low training rate. The percentage of trained workers aged 15 years and over working in the agriculture, forestry and fishery industries only increased from 4.3% in 2015 to 4.6% in 2020 [13, p.164]. The above limitations are really a big challenge in realizing the aspiration to turn Vietnam into an "agricultural power" in the world.

Fourthly, science and technology had not yet promoted their role as a driving force in production, and had not made breakthroughs to enhance added value and competitiveness of products.

The Strategy for Science and Technology Development of Agriculture and Rural Development for the period 2013 - 2020 determined that science and technology would contribute 40% of the added value of agriculture. However, according to the assessment of the Ministry of Agriculture and Rural Development, the contribution of science and technology innovation to agricultural growth was still limited (about 30%), while the contribution of science and technology was up to over 50% in many developed countries [12, p.5]. Research and application of science and technology had not created a driving force for the growth of the agricultural sector. The 13th Congress of the Communist Party of Vietnam assessed that "Agricultural development still has unsustainable factors, and growth is not stable" [14, p.61].

3.2. Some experiences from the process of the Party leading the development of high-tech agriculture (2011 - 2020)

Firstly, focusing on propaganda on the development of high-tech agriculture.

This is the most important content drawn from the process of the Party leading the development of hi-tech agriculture from 2011 to 2020. To implement this experience well, The Party committees and authorities at all levels should be aware of the role and necessity of developing hi-tech agriculture, strengthen communication and awareness raising for farmers and businesses about hi-tech agricultural development and digital transformation in agriculture, diversify methods and forms of propaganda and advocacy.

Secondly, determining the right policy and timely direction to focus on solving barriers in the development of high-tech agriculture.

High-tech agricultural development faced many barriers such as science and technology, human resources, fragmented land, unstable consumption market. In the period 2011 - 2020, the Party had identified tasks and solutions to create favorable conditions and solve the above-mentioned barriers. In order to apply this experience well into the practice of developing high-tech agriculture in the coming time, it is necessary to perform well the following contents: improving land policies to encourage land accumulation and concentration; diversifying capital sources by encouraging organizations, individuals and all types of enterprises, especially domestic and foreign enterprises, and scientific and technological organizations to invest in high-tech agriculture; diversifying forms of training and fostering to improve the quality of human resources in agriculture, especially high-quality human resources; expanding the market for high-tech agricultural products.

Thirdly, combining the development of high-tech agriculture with new rural construction and improvement of people's living standards.

In the years 2011-2020, the Party set out the policy of comprehensive and effective agricultural development in the direction of industrialization and modernization in association with well solving problems of farmers and rural areas. In the future, in order to implement this experience well, it is necessary to ensure the comprehensiveness and synchronism in planning policies and directing to solve problems of agriculture, farmers and rural areas. Besides, the Party should develop efficient and sustainable agriculture in the direction of ecology, high technology, quality improvement and added value. In addition, building a new rural area in the direction of modernity is associated with improving the role of farmers.

Fourthly, promoting the synergy of both the political system and relevant forces in the development of high-tech agriculture.

The Party's leadership on development of high-tech agriculture from 2011 to 2020 shows that the Party has promoted the synergy of the political system and economic sectors in this field. Thereby, high-tech agriculture has achieved very important achievements, contributing to the growth rate of the agricultural industry. Therefore, in the coming time, it is necessary to promote the leadership role of the Party and the State in the development of hi-tech agriculture. In addition, the Fatherland Front, political and social organizations and economic sectors need to promote their roles in the development of hi-tech agriculture. At the same time, the Ministry of Agriculture and Rural Development should promote its role in guiding the implementation of high-tech agricultural development programs.

4. Conclusion

The development of high-tech agriculture (2011-2020) had included both great achievements and some limitations. From this process, the article summarizes many valuable experiences to apply to the development of high-tech agriculture in the future. Therefore, it is necessary to continue to propagate and raise awareness for the subjects about the position and role of developing hi-tech agriculture; continue to perfect mechanisms and policies to support the development of hi-tech agriculture. Along with that, it is necessary to mobilize the synergy of the whole political system and economic sectors in the development of high-tech agriculture.

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