Ipsard

ADB
ASIAN DEVELOPMENT BANK

MAIN CROP DEVELOPMENT IN VIET NAM

SITUATION AND ORIENTATION

REPORT

MAIN CROP DEVELOPMENT IN VIETNAM
SITUATION AND ORIENTATION

Hanoi, 2021

The Project of "*Enhancing Agricultural Competitiveness in Viet Nam*" was implemented by the Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD) and the Asian Development Bank (ADB) with the target of competitiveness enhanced and inclusive growth sustained in the agriculture sector of Viet Nam in line with the Agriculture Restructuring Plan for a sustainable and high value-added agricultural development. Under the project, the IPSARD in collaboration with experts wrote the report "Main crop development in Vietnam: Situation and Orientation" to analyse and evaluate the main achievements and limitations of the crop sector in Viet Nam in the period of 2010-2020, and orientations to 2030.

We would like to express our sincere thanks to the Japan Poverty Reduction Fund entrusted through the Asian Development Bank (ADB) for sponsoring the development, printing and publishing of this report.

ACKNOWLEDGEMENT

The report "*Main crop development in Viet Nam: Situation and Orientation*" is conducted by experts of the project "Enhancing Agriculture Competitiveness in Viet Nam" (KSTA) (Nguyen Dinh Long, Tran Xuan Dinh, Tran Kim Hao, Doan Huu Tien) and researchers from the Institute of Policy and Strategy for Agriculture and Rural Development (Tran Cong Thang, Truong Thi Thu Trang, Bui Thi Viet Anh, Pham Minh Tri, Le Minh Duc, Dao Phuong Thao) in 2021. The report represents efforts to provide background input to support the Ministry of Agriculture and Rural Development for building the national strategy for the crop sector development towards 2030 and vision to 2045. During the process, the research team would like to thank leaders of the Department of Crop Production and senior experts: Dr Cao Duc Phat (former Minister of Agriculture and Rural Development) and Dr. Nguyen Van Bo (former President of the Viet Nam Academy of Agricultural Sciences) in providing inputs, ideas, and comments to develop the report and complete the Strategy.

The research team would also like to thank Dr. Garth Atkinson and Dr. Dang Kim Son - consultant team leader and deputy team leader of the KSTA for the comments on the orientation and structure, and some details in the report and Mr. Takeshi Ueda - the Principal Natural Resources and Agriculture Economist of the Asian Development Bank (ADB) for his continuing support to this activity.

We would like to express our sincere gratitude to the technical support of the KSTA project and the timely financial support of the Japan Poverty Reduction Fund entrusted through ADB for enabling the research team to complete the report.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

BVTV	ASEAN statistic data
AFF	Agro-forestry-fishery
CPTPP	Comprehensive and Progressive Trans-Pacific Partnership Agreement
EVFTA	European-Viet Nam Free Trade Agreement
EU	European Union
FDA	Food and Drug Administration
FTA	Free Trade Agreement
GSO	Viet Nam's General Statistics Office
HACCP	Hazard Analysis and Critical Control Point System
IPSARD	IPSARD Institute for Policy and Strategy for Agriculture and Rural Development
MARD	Ministry of Agriculture and Rural Development
NTMs	Non-tariff measures
TBT	Technical Barriers to Trade
SPS	Sanitary and Phytosanitary
VND	Viet Nam Dong

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

Crop sector plays an important role in Viet Nam's agricultural sector and whole economy. With the diversity of products, the crop sector have made a great contribution to ensuring national food security, providing input materials for the livestock and food processing sector, helping Viet Nam to become one of the world leading agriculture, forestry and fisheries (AFF) exporters. In the period of 2010-2020, the gross ouput value of crop production maintained a high growth rate of over 3% per year. Production efficiency has been constantly improved, the average output value per hectare of production land has increased nearly twice[1]. Export turnover of agricultural products increased by 6.3% per year on average[2]. The average income of rural residents has improved significantly, increasing nearly 3 times. The lives of rural people have improved markedly[3]. The crop sector has 8 key agricultural products of Viet Nam[4], including rice, coffee, rubber, cashew, pepper, tea, vegetables, cassava and cassava products. The export value of main crop products has continuously grown, reaching over 16.6 billion US dollars[5], accounting for 40.3% of the total AFF export turnover of Viet Nam in 2020.

Besides the outstanding achievements, the crop sector still has many limitations that reduce competitiveness and faces many risks and challenges when participating in international trade. Specifically, the production scale is small and scattered. The capacity in many production areas is still limited. The rate of mechanization and application of technology is low, the quality of some products is still low. The production management to ensure food hygiene and safety and to meet the standards of international markets is poor. The rate of processing is low, so the competitiveness of Viet Nam's products in markets is mainly based on low price and bulk export.

In the new context of the COVID-19 pandemic, climate change, and market competition, the crop sector have been facing many greater difficulties and challenges. Therefore, it is necessary to develop a separate strategy for the sector development until 2030 to specify orientations and solutions for sustainable development.

Contributing to the formulation of the Strategy for Crop Sector Development to 2030 and toward 2045, the background report "*Main crop development in Viet Nam: Situation and orientation*" is conducted to assess the current development situation, achievements and limitations of the sector in the period of 2010-2020, as well as analyze the new opportunities and challenges for the sector toward 2030. The results are the basis for building orientations and solutions for the Crop Sector Development Strategy to 2030 and orientation toward 2045.

---

[1] The output value per hectare of arable land reached 54.6 million Viet Nam Dong (VND) in 2010 and reached about 99.5 million VND in 2020 (an increase of 1.8 times).
[2] Export turnover of crop products in 2010 reached 10.3 billion US dollars, in 2020 18.5 billion US dollars, an average increase of 6.1%/year.
[3] Per capita income of rural residents is 12.8 million VND in 2010 and increase to 43 million VND in 2020 (an increase of 3.4 times).
[4] MARD has announced 13 key national agricultural products including: 1-Rice; 2-Coffee; 3-Rubber; 4-Cashew nut; 5-Pepper; 6-Tea; 7-Vegetables and fruits; 8-Cassava and cassava products; 9-Pork; 10-Meat and eggs of poultry; 11-Pangasius; 12-Shrimp; 13-Wood and wood products.
[5] Including rice, fruits and vegetables, main industrial crops.
[6] The statistical service of the ASEAN Secretariat.

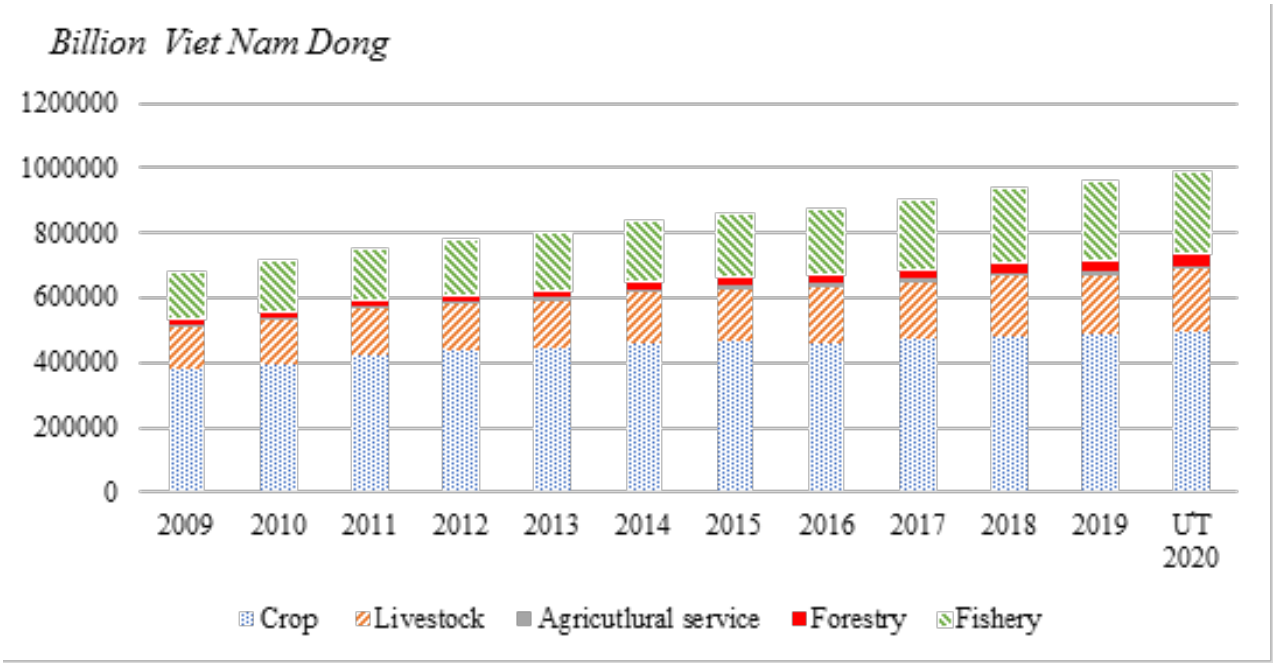
Since the level of data update varies between sources, this report uses a combination of domestic data sources (General Statistics Office of Viet Nam, General Customs Office, Ministry of Agriculture and Rural Development-MARD, Ministry of Industry and Trade) and international data (United Nations Comtrade Database-International Trade Statistics-UNCOMTRADE, ASEANSTAT[6]) to analyse and evaluate production, trade, and processing of crops.

2. OVERVIEW OF VIET NAM'S CROP DEVELOPMENT OVER THE PAST 10 YEARS

2.1. Production

Viet Nam has favorable climate and land to develop a variety of crops. The production output value of the crop sector has continuously increased, made an important contribution to the overall growth of the AFF sector. In the period of 2010-2020, the gross output value of the crop sector increased by an average of 3.11%/year; accounting for more than 50% of the total AFF output value. The share of crop gross output decreased from 55.7% in 2010 to 50% in 2020 when the forestry and fishery outputs achieved faster growth rates, resulting in proportional increase in AFF's output.

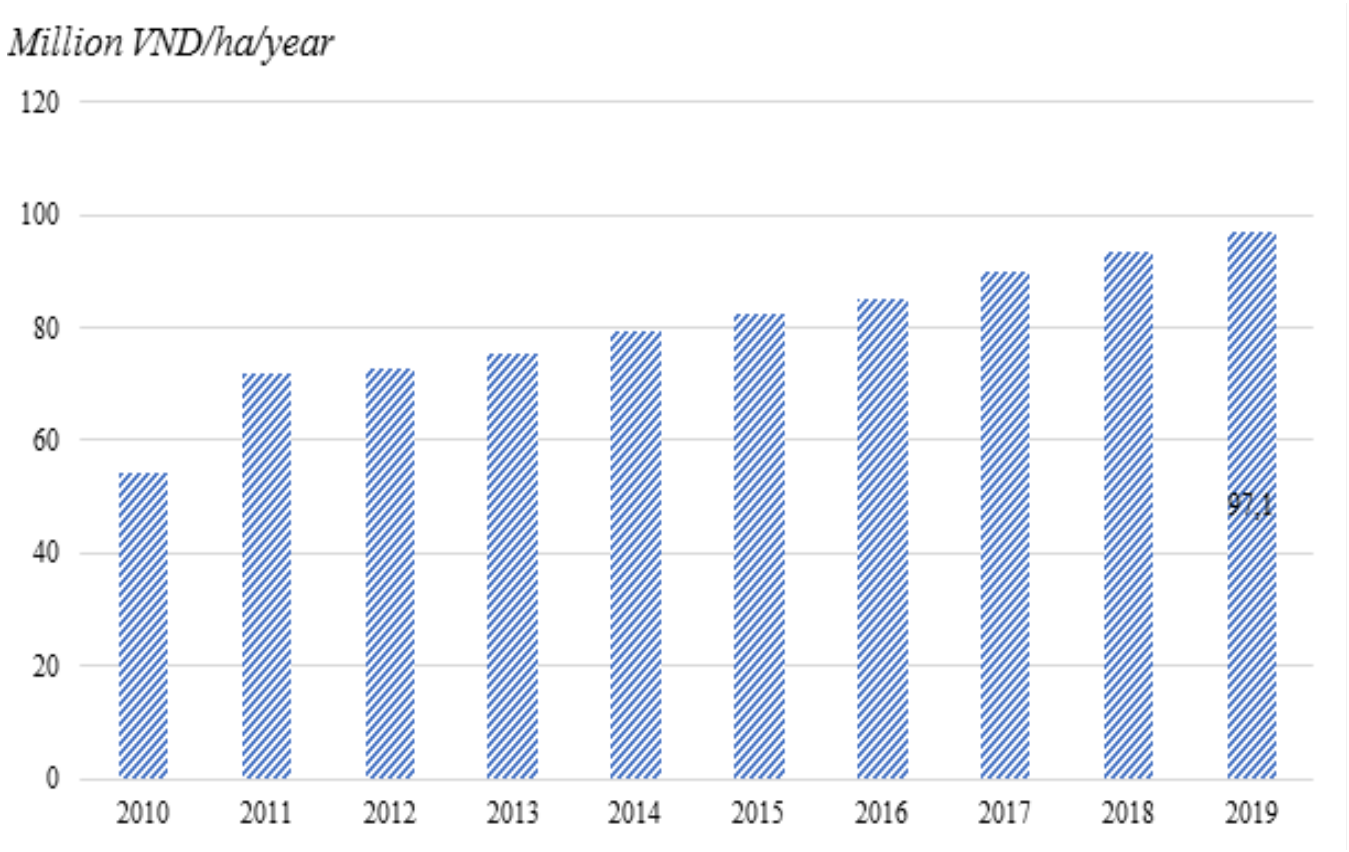
Figure 1: The gross output value of the crop sector in AFF of Viet Nam (2010 constant price)



Source: GSO, 2021.

The annual output value per hectare of arable land has increased continuously and increased nearly 1.8 times from 54.6 million VND/ha/year in 2010 to 97.1 million VND/ha/year in 2019. Many crops had a rapid growth rate in production value in the period of 2010-2019 such as fruits (increased 2.17 times), tea (increased 2.63 times), and cashew nut (increased 1.85 times).

Figure 2: Annual average output production value per ha of the crop sector



Source: GSO, 2021.

The area structure of the crops has been shifted sharply according to the direction of reducing the area of annual crops and increasing the area of perennial crops with higher economic efficiency and to take advantages of market opening opportunities. The area of perennial crops increased rapidly from more than 2,846.8 thousand hectares in 2010 to 3,563.1 thousand hectares in 2020 (average growth rate of 2.27%/year), while the area of annual crops decreased from 11,214.3 thousand hectares to 11,060 thousand ha (decreased by 0.14%/year), especially with the production area conversion from rice, maize and short-term industrial crops to fruit trees, vegetables, coffee, and pepper production nationwide and to aquatic products with higher efficiency such as shrimp and pangasius in the Mekong Delta (due to heavy impacts of climate change, saline intrusion). In the period of 2010-2020, 464 thousand hectares of rice farming has been converted to other fruits cultivation and aquaculture.

Figure 3: Area of major crops in the crop sector

Source: GSO, 2021.

Productivity and production output of main crops have continuously increased since 2010. In 2020, rice yield reached 5.89 tons/ha with an increase of 0.55 tons/ha; maize yield reached 4.8 tons/ha with an increase of 0.69 tons/ha; cassava 20.02 tons/ha with an increase of 2.2 tons/ha; coffee yield reached 2.47 tons/ha and higher 0.26 tons/ha; tea yield 9.63 tons/ha, an increase of 2.3 tons/ha compared to 2010. The crop yield has increased positively thanks to application of new varieties and new farming techniques, and increases in using agricultural inputs. As a result, the production output of most main crops increased rapidly during this period, such as rice production output increased by 11.6%, tea production output increased by 29%; rubber output increased by 59.6%; orange production increased by 76%; banana production increased by 37%. However, the farming area of grain cereal crops decreased (a decrease of 154,000 ha in the period of 2010-2019), their production output still increased by 3.5 million tons, contributed positively to ensuring food security in the country and maintaining stable export quantity of 5.5-6.5 million tons of rice per year.

Many new varieties, scientific and technical advances, and good production practices have been applied and implemented in crops production. In the period of 2013-2020, MARD has recognized 393 new plant varieties, 101 technical advances. Most new plant varieties have yield increases of 10-15%. To improve product quality, many good production processes have been applied such as Good Agricultural Practices (VietGAP), Global Good Agricultural Practices (Global GAP), Fair Trade certification FLO (Fairtrade Labelling Organizations), certification standard of the RFA (Rain Forest Alliance), standard UTZ (UTZ Certified), standard of the Common Code for the 4C coffee community. As of June 2020, the agricultural production area certified by VietGAP for cultivation reached 39,220 hectares. In which, the area of fruit trees was 22,660 ha; the are of vegetables was 5,990 ha; rice area: 5,140 ha; tea area: 5,120 ha; coffee are: 101 ha; other

trees: 105 ha[7]. In coffee, the certified coffee area (4C, UTZ, RFA, FLO) has been over 200,000 hectares with an prodction output of about 600,000 tons of green coffee[8]. The total area of forest certified for sustainable forest management (FSC-Viet Nam Forest Certification System) has been about 269,000 ha[9]. Accordingly, the production efficiency of farmers under standards/ good practice processes increased by 15-20% compared to the production areas without applying these standards (MARD, 2020).

In additon, Viet Nam has developed a number of large specialized production areas across the country such as rice areas in the Mekong Delta and Red River Delta, coffee areas in the Central Highlands, pepper areas in the Southeast and Central Highlands, fruit areas in the Mekong Delta, and tea production areas in the Northern Midlands and Mountains region, and Lam Dong province. Many provinces have built concentrated large fields and material concentrated areas for export and processing sector. In particular, Viet Nam has about 1,700 large fields of rice production with area of 516 thousand ha, of which the proportion of rice large fields under signed contracts between consumption stakeholders and producers (farmers/farms/ cooperatives) is nearly 27% (Tran Xuan Dinh, 2021). Some raw material production areas have been built in association with the development of the processing enterprises. Some effective linkage models between producers and companies based signed contracts are: Thai Binh Seed Corporation, Cuong Tan Limited Company, Nam Dinh Province, Tan Cuong Cooperative-Dong Thap, Loc Troi Group, Gentraco-Can Tho Joint Stock Company, Southern Food Corporation in the rice sector; Nafood, Doveco, Vineco, TH group in the fruit and vegetable subsectors.

To ensure origin traceability of agricultural products for export, many provinces have promoted to build large material areas that have been granted planting area unit codes (Banana, dragon fruit, Jack fruit, etc.) by MARD. In addition, many domestic packaging facilities and companies have been also granted codes to fullfil conditions for export to foreign markets (China, United States of America-USA, Australia, Japan, North Korea).

Irrigation infrastructure for growing crops has been continuously improved. In 2020, the total irrigation capacity of the irrigation system reached 4.062 million hectares of arable land, ensuring irrigation of 7.18 million hectares (compared to 6.92 million hectares in 2013). The proportion of the annual planting area that is actively irrigated in 2020 reached 75% (compared to 71.7% in 2015). Water-saving irrigation techniques and technologies have increased production efficiency and crop productivity by 10-30%. The economical irrigation methods helped saving water by 20-40% compared to traditional irrigation methods. About 520,000 hectares of upland crops have been applied advanced and water-saving irrigation technology across the country.

Thanks to the above results, the income of rural people has been improved markedly. The income per capita in rural areas in 2019 reached 40.8 million VND/person, an increase of more

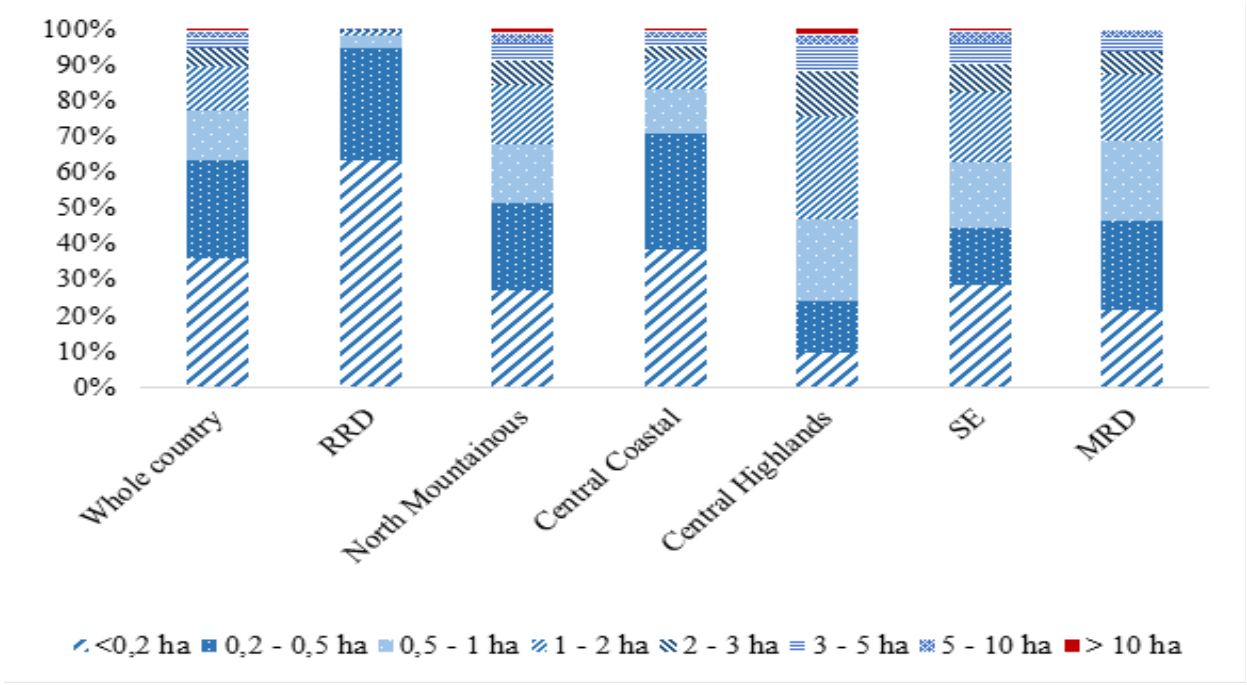
---

[7] Ministry of Agriculture and Rural Development. Data quoted from the assessment of the results of the implementation of the plan for 2020 in the Agriculture and Rural Development Plan and the 2011 state budget estimate attached to Official Letter No. 5535/BNN-KH dated August 14, 2011. 2020
[8] Department of Horticulture. General data from Dak Lak, Dak Nong, Lam Dong, Gia Lai, Son La provinces in 2020
[9] Government Electronic Newspaper. Figures are from the Scheme on Sustainable Forest Management and Forest Certification. http://baochinhphu.vn/ Kinh-te/Tin-hieu-tich-cuc-tu-De-an-Quan-ly-rung-ben-vung-va-chung-chi-rung/382507.vgp

than 3.1 times compared to 2010 (12.84 million VND/person/year). The rate of poor households decreased from 17.4% in 2010 to 8.0 % in 2019.

Besides the achievements, crops production still has many shortcomings. Production growth is unsustainable when yield growth is still mainly based on increasing natural resources and agricultural inputs, the proportion of products meeting certified standards is low. The content of science and technology, processing in crop products is not high, added value and labor productivity is still low. The land self-accumulation capacity of farmers and farms for investment in technological innovation[10] is weak. Small-scale farmers account for high proportion and, labor productivity[11] and income are low. More than 60% of households engaged in agricultural production have less than 0.5 ha of agricultural land. The average agricultural land area of Viet Nam farmers ranks 164 in the world. Viet Nam's agricultural labor productivity in 2019 was only 1/3 of China's, Indonesia's, Thailand's, Philippines' and only 1/10 of Malaysia's despite growth. Meanwhile, at present, land resources are limited, so it is difficult for farmers to expand their production scale. On the other hand, farmers have low qualifications and weak negotiation capacity in trade transactions. In the context of economic integration and development of science and technology, farmers lack new knowledge and skills in technology, sustainable development and market standards.

Figure 4: Farming households' classification by average agricultural land area in 2016



***** RRD: Red River Delta, SE: South East, MRD: Mekong Delta.*

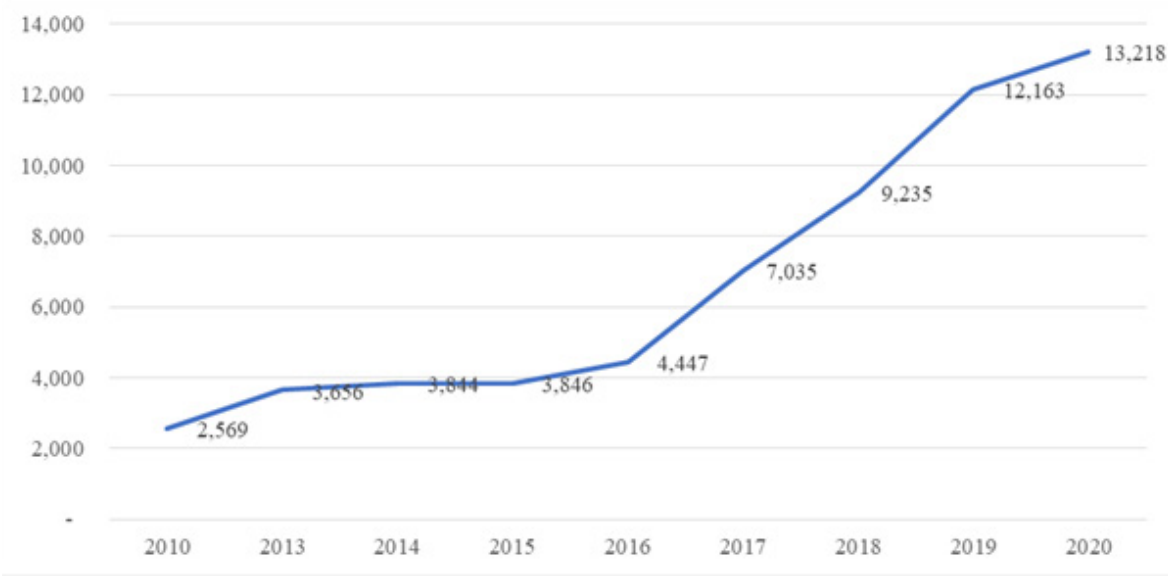
Source: Calculated by IPSARD from AgroCencus.

[10] *The average accumulated capital is 17.4 million VND/household, which is difficult to help expand reproduction. Only 50% of rural households have access to loans, of which only about 50% come from official credit sources, which do not meet their borrowing needs (IPSARD survey 2014).*

[11] *Labor productivity in Viet Nam compared to Singapore is only 1/20th of 2000, and 1/14th of 2014.*

Large crop farms have been changed slowly and have scale, technology level and production efficiency only at the level of the average farmer household in other countries in Asia. In 2019, Viet Nam had 8,420 crop farms, a decrease of 215 farms compared to 2011 (8,635 crop farms) (MARD, 2021b). According to the calculation from the GSO's 2021 Enterprise Census, the number of enterprises invested in agriculture has increased to 13,218 enterprises in 2020[12], an increase of 5 times compared to 2010-but only about 7,600 enterprises invested in direct agricultural production, accounting for about 1% of the total enterprises in Viet Nam. The majority of them are small enterprises. The number of enterprises having less than 10 employees accounted for 49.1% and the number of enterprises with capital of less than 10 billion Viet Nam dong accounted for 68.7%.

Figure 5: Number of enterprises invested in agriculture production in Viet Nam



Source: GSO

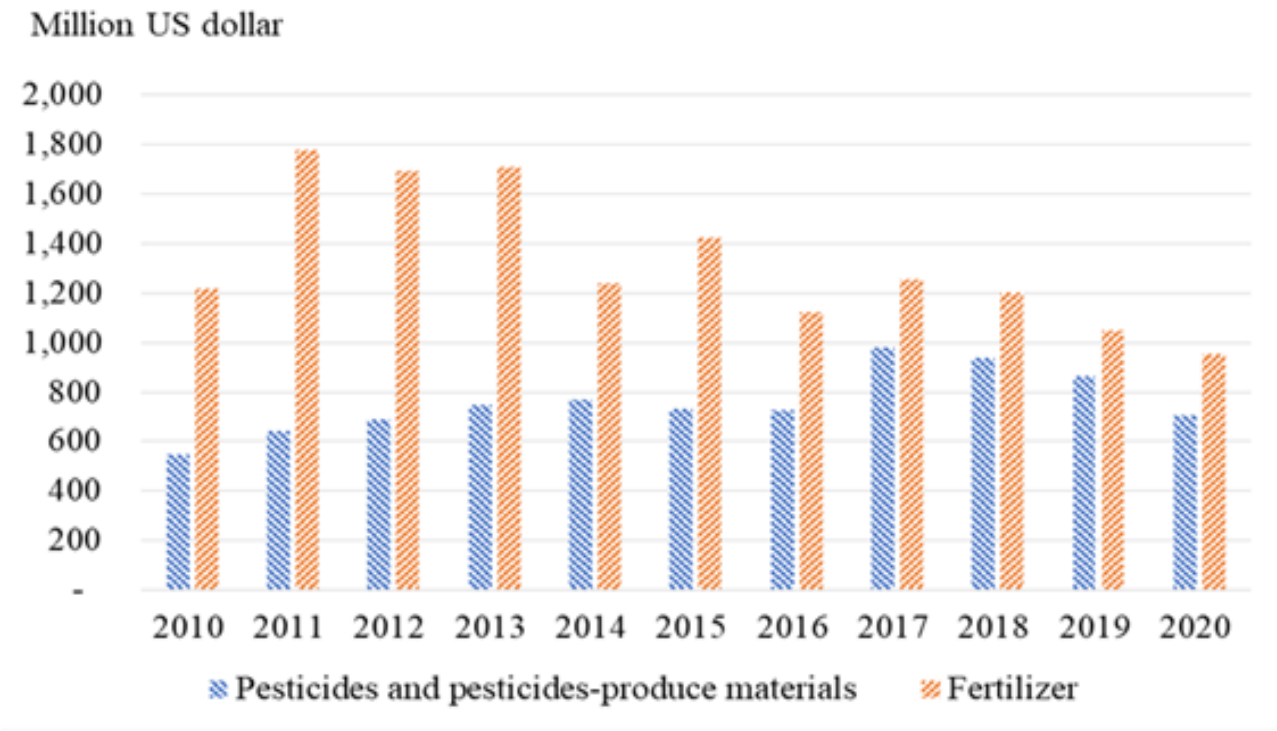
The growth in productivity and output production have been mainly based on the increase of using agricultural inputs. The use of fertilizers, pesticides and other chemicals as well as the use of water and land of farmers in crop production has been unsustainable. The inappropriate use of these inputs has been making insecure residues on products, polluting land environment, and adversely affecting health of farmers and consumers. Therefore, the percentage of crop products that meet high food safety standards of big export markets such as the USA, EU, and Japan has been quite low.

In addition, many agricultural inputs and materials for crop production must be imported from foreign countries, so the domestic inputs price has been greatly influenced by foreign price, which has been directly affecting the efficiency of Viet Nam's crops production. In the context of the COVID-19 pandemic, according to the Center for Agricultural Policy (CAP/IPSARD)'s survey in 2020, the prices of main inputs for production (plant protection drugs, fertilizers) have increased

[12] *In 2020, there were about 13,218 enterprises investing in producing, processing and trading of agro-forestry-fishery products, 7,600 of which just over enterprises directly participate in agricultural production activities.*

by 20-30% compared to previous years. Moreover, many enterprises could not import inputs as their demands on time because of limited supply sources, overloaded logistics services, and high logistics costs. Accordingly, the production cost at farm gate in 2020 increased by 20-30%, while the selling prices of agriproducts did not increase.

Figure 6: Inputs import value for agricultural production in Viet Nam



Source: General Customs Office

Cooperation and link based on contracts among stakeholders in agricultural value chain are still limited and weak. The number of enterprises participating in the contracts linking with producers (farmers, cooperatives, collective groups) for the consumption of crop products is small. Currently, the proportion of crop[13] production value produced under signed link contracts has only reached 12.8%. As a result, in harvesting time, a sharp drop in crop prices occurs frequently such as vegetables, fruits, rice, pepper, rubber etc. This situation occurs due to many reasons: i) Lack of linkage and cooperation between producers and consumption enterprises; ii) The capacity of the producers to connect with markets is weak, heavily dependent on intermediary traders; iii) Production areas of many crops exceeded projected plans of the Government so there is large supply exceeding the consumption capacity (such as pepper, rubber).

The proportion of crop area applying mechanization is still low and uneven across regions in the whole country. In rice production, mechanization has been mainly applied in the stages of land preparing, caring and harvesting rice. The level of mechanization in rice transplanting by machine is still low. Mechanization in the production and harvesting of perennial industrial crops and fruit trees is even lower.

[13] *Including rice, vegetables, fruits, industrial crops and other crops*

The application of high technology in cultivation is still limited, the rate of application of economical irrigation accounted for about 14% of the agricultural production area. Production according to VietGAP process and equivalent still accounts for a low percentage. The proportion of production output value under good agricultural practice process is only 6.8% (MARD,2021). Production models applying high technology are replicated in production slowly.

The infrastructure system for production, especially rural transportation and in-field transportation infrustructure as well as irrigation infrastructure, although has been improved and increased investment capital, but could not meet need of production development. In the past 10 years, the Government has issued many supporting policies for production and linkages (credit, investment, land, technology, training, insurance, etc.), especially there have been many preferential credit programs that positively supported for production stakeholders, but not all producers or enterprises could access these policies due to complicated procedures and lack of finalcial resources. Moreover, crop production has been facing difficulties and challenges on weather, climate and new diseases. Climate change, natural disasters and diseases are becoming more complicated. The frequency of natural disasters have been increasing that has reduced production efficiency in many regions (such as the Mekong Delta). Meanwhile, the capacity of farmer households to adapt to these changes is still weak. Therefore, quality control in production has been meeting many challenges that are requiring new processes, techniques, varieties and pesticides transfering to famers to promptly respond to new conditions.

2.2. Processing and preservation

Viet Nam's agricultural processing sector has improved positively in the period of 2010-2020. That helped growth rate of agricultural added value maintained at about 7-8%/year. Many provinces have focused on developing agricultural product processing sector with designed processing capacity of 100 million tons of agricultural materials per year. Currently, Viet Nam has more than 43,000 enterprises involving in trading and processing agricultural, forestry and fishery products. In which, the total number of industrial-scale Agro-Forestry-Fishery (AFF) processing enterprises directly linked with export nationwide is 7500, an increase of 2,600 establishments compared to 2010[14]. As of 2019, Viet Nam had about 600 industrial-scale rice milling establishments with a milling capacity of about 10 million tons of products per year, 720 coffee processing establishments and 320 coffee product preservation establishments, 465 cashew processing enterprises (of which 20 are large enterprises); 200 pepper processing and trading enterprises; 60 processing and exporting enterprises; 145 industrial-scale fruit processing enterprises located in 28/63 provinces, etc. In the period of 2016-2020, 67 new large Agro-Forestry-Fishery processing establishments were built; in which 29 ones are involving in processing crop products (Tran Xuan Dinh, 2021). As a result, the value of processing products for export has been improved, that contributed significantly to export turnover and added value for Viet Nam's crop sector.

---

[14] In 2010, there were about 4,900 medium and large AFF processing establishments – according to the data of the Department of Processing and Market Development

However, the proportion of post-harvest processed crop products is still low, and kinds of crop products is not diverse. The infrastructure for preservation and processing such as warehouses, storage facilities, drying yards, wharves, etc. is underdeveloped. As the results, post-harvest loss rates are still high (vegetables, fruits, cassava: 20-30%; coffee, pepper, cashew, tea: 10-15%; rice: 8-9%). Especially, in term of fresh fruits for export, the fresh preservation time is only 30-40 days. The scale of agricultural product processing system is small, and the technology and equipment are outdated, so the quality of the products is still poor. In structure of processing products, the preliminary processing products with low added value accounts for 80-90%, the processed products with high added value accounts for only 10-20%. Hence, the AFF processing sector has not contributed much to improving the value of Viet Nam agricultural products (MARD, 2021).

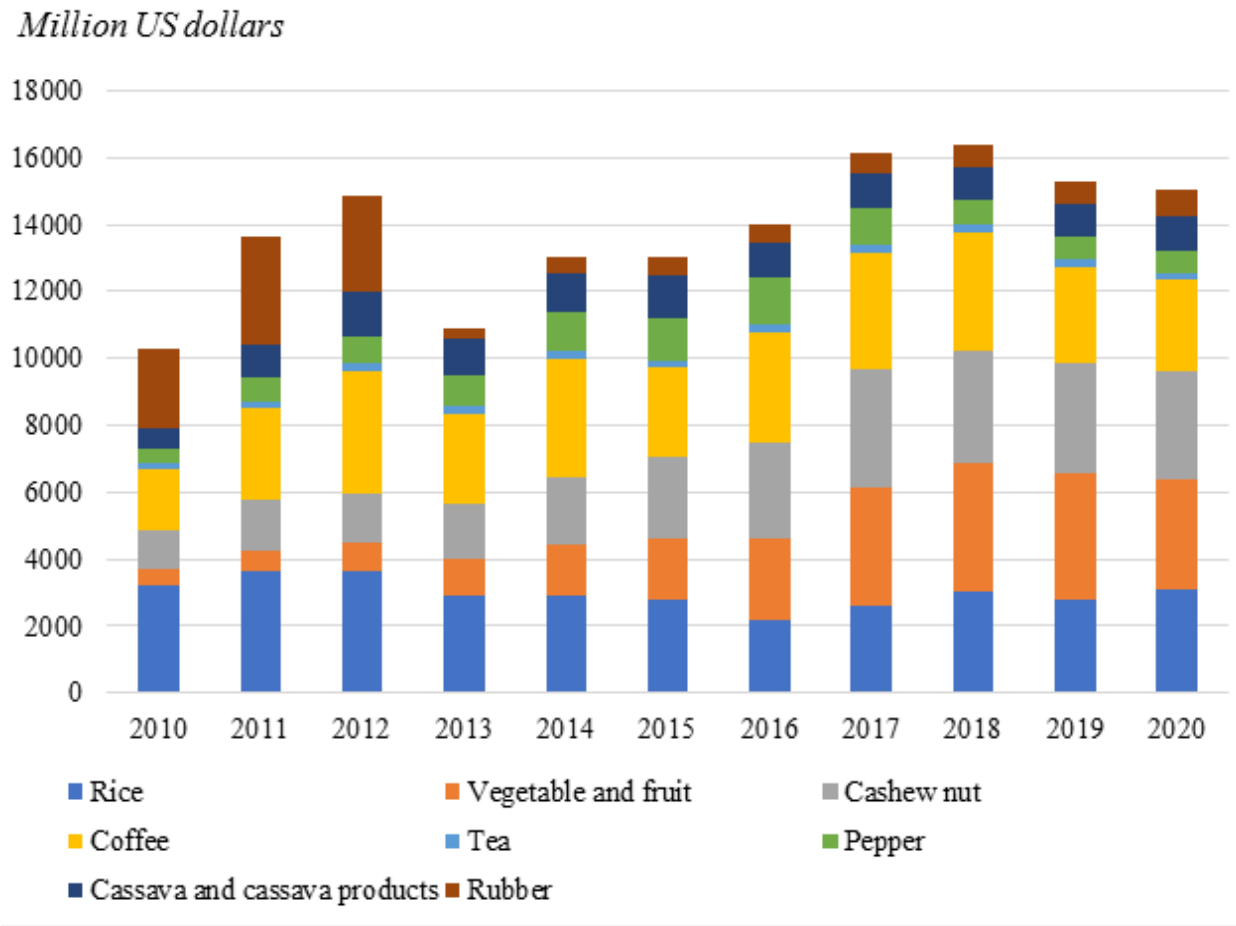
The current storage and preservation system (especially cold stocks) does not meet the current domestic demand. As of December 2019, the whole country had 48 cold storages for agricultural and aquatic products preservation with a capacity of about 600,000 pallets, that mainly concentrated on serving certain export markets (such as the US, EU, Japan, Australia). In which, there were 36 cold storages (526,364 pallets) in the South, 1 cold storage (21,000 pallets) in the Central, and 11 cold storages (54,780 pallets) in the North. With current capacity, the storage system only meets about 30-35% of domestic demand (Ministry of Industry and Trade, 2020a).

2.3. Trading

The period of 2010-2020 witnessed Viet Nam's strong participation in international economic integration with 15 signed free trade agreements (FTA) and 2 on-going negotiating FTAs. The advantages from cutting-tariff under FTAs have been improving competitiveness of Viet Nam's agricultural products, promoted trade in the world market, greatly contributed to export value growth. The export value of agricultural products continuously increased from 20 billion US dollars, in 2010 to 41.19 billion US dollars in 2020. In the past 10 years, Viet Nam's agriculture had an average trade surplus of 7-8 billion US dollars per year. The structure of exported agricultural products has also improved in the direction of increasing high-value, processed and high-quality products.

The export of crop products has contributed greatly to the growth of agricultural exports from 2010 to the present. The export turnover of crop products has contributed 40-45% of the total AFF export turnover.

Figure 7: Viet Nam's export value of main crops



Source: General Customs Office

Crop products for export are increasingly diversified and maintained their important and high position in the world market. Viet Nam agricultural products have been presented in more than 196 countries and Viet Nam is one of 20 biggest agricultural exporters. Many products of the crop sector continuously are ranked leading positions in the world agricultural market, such as coffee (ranked 2nd), pepper (ranked 1st), cashew nuts (ranked 2nd), rubber (ranked 3rd), tea (ranked 5th) and rice (ranked 2nd) (According to calculation data from Uncomtrade and the General Customs Office in 2018), making great contributions to creating a trade surplus of the agriculture-forestry-fishery sector. Many crop products are meeting the standards of major markets better such as the USA, Australia, Japan, Korea, and the European Union (EU).

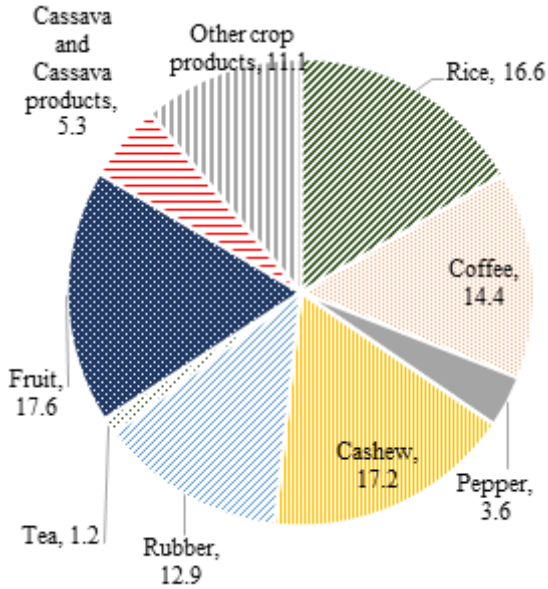
The structure of the agricultural export products has changed markedly in the direction of increasing the proportion of high value products such as fruit and vegetable and reducing the proportion of low-value products such as rice, and cassava. Crop products with an increased share in the structure of agricultural exports such as vegetables and fruits (up from 460.3 million US dollars, accounting for 2.3% of agricultural export value in 2010 to 3.27 billion US dollars, accounting for 7.97% in 2020), cashew nuts (up from 1.1 billion US dollars, accounting for 5.6% in 2010 to 3.2 billion US dollars, accounting for 7.9% in 2020). There were some cop commodities with a decreasing proportion in export value structure, including rice (down from 3.2 billion US

dollars, accounting for 16.1% in 2010 to 3.12 billion US dollars, accounting for 7.7% in 2020)[15]. In term of some other products such as rubber, tea and coffee, although the exprot value of them continued to increase strongly, their proportion in the structure of export agricultural products decreased.

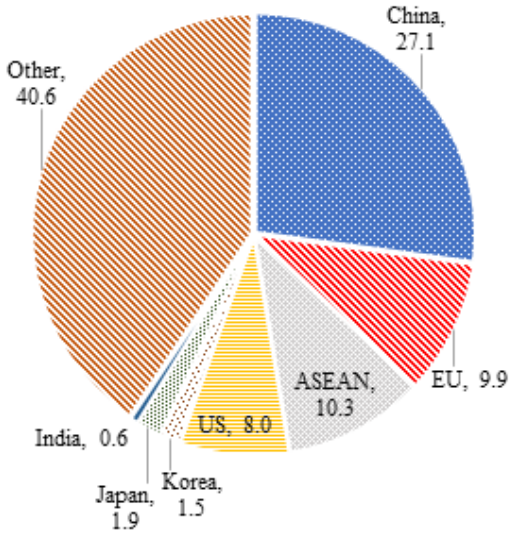
However, in terms of export markets, China is still Viet Nam's leading export market of crop products, accounted for 27.1% of Viet Nam's total export value of crop products, while EU accounted for 9.9%, ASEAN accounted for 10.3%, the US accounted for 8.0% of total main crop export value. Many crop products such as mango, dragon fruit, vegetable have reached high-quality markets (including the EU, Australia, Japan, South Korea, etc.). The Government and ministries on policy efforts have implemented policy solutions to reduce dependence on the Chinese and ASEAN markets, but the level of dependence on these markets has been still heavy.

Figure 8: Export value structure of Viet Nam's main crops in 2020

Export value structure by crop products (%)



Structure of export value by markets (%)



Source: MARD, 2021

In general, Viet Nam's crop products mainly provided raw input materials for the global agricultural value chain, while added-value of agricultural products is mainly from processing, packaging, and trading activities. The private and public investment capacity in processing and preservation has been still weak. The added value, quality and uniformity of export products have been low. Over 90% of them was raw. Logistics services (transportation, loading and unloading, warehousing, packaging, port services) have been developed slowly, depended on foreign companies highly, so logistics costs have accounted for a high proportion in product costs (rice: 29.8%, coffee: 9.5%, vegetable: 29.5%)[16].

[15] *Calculations of research team based on the General Customs Office's data*
[16] *Data in 2014 – based on data of ALG report – 2014.*

Therefore, the quality and competitiveness of crop products have been quite weak. Their competitiveness mainly based on low price and big quantity. Many products did not meet high-quality standards of markets (because of high residue of substances, containing impurities, not meet technical standards), so they have been rejected, given high warnings. On the other hand, when participating in the world market, Viet Nam's agricultural products are subject to many great risks such as being subjected to trade remedies or be increased frequency of Sanitary and phytosanitary inspection unreasonably by partners.

In addition, about 80-85% of agricultural products have not yet built a brand, have no logo or label, and are exported through foreign brands, reducing competitiveness, and reducing domestic added value.

In the next section, the report focuses on analyzing and evaluating achievements and limitations on key crop groups, including rice, vegetable and fruit, main industrial crops (coffee, pepper, cashew, rubber, etc.) – these are key agricultural commodities that contribute high proportion in export value of Viet Nam in 10 previous years.

3. ACHIEVEMENTS AND SHORTCOMINGS OF MAIN CROPS IN VIET NAM IN THE PAST 10 YEARS

3.1. Rice

3.1.1. Achievements

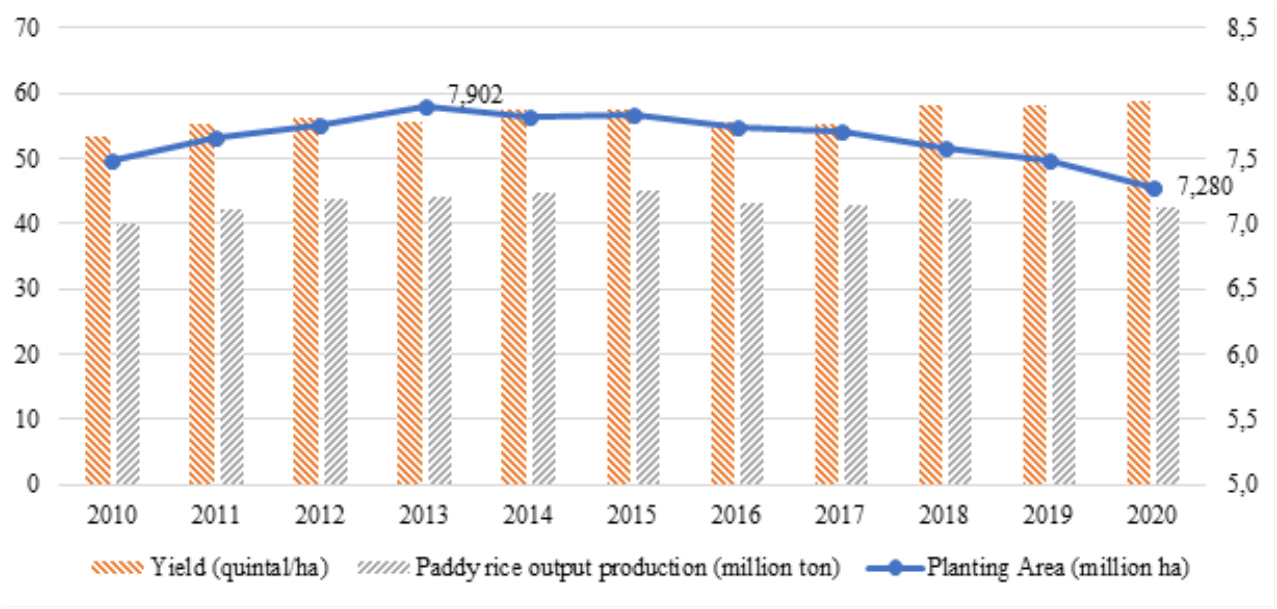
Rice production has remained stable for a long time, making a positive contribution to national food security. Rice sector has contributed 70% to Viet Nam's total food output. The average paddy rice per capita reached 440 kg/person/year over 2010-2020 period. The planting area reached over 7.2 million ha annually. From 2013 along with the agricultural restructuring process, the rice croppingarea decreased from 7.9 million hectares in 2013 to 7.28 million hectares in 2020 (average reduction of more than 1.2%/year within 5 recent years) due to the conversion of crops on rice land. Rice production output remains at 40-45 million tons per year (equivalent to 26-29 tons of rice), annual exports of 6-7 million tons of rice (GSO, 2020).

Since 2014, the Government has regulated flexible use of rice land with allowing the conversion to other crops on rice land in accordance with natural ecological conditions, market demand and adaptating to climate change. As a result, many rice areas have been converted to other crops that generating higher income and efficiency. However, the area of rice cultivation is still maintained at 3.7 million hectares (in which 3.1 million hectares for 2-crop rice production), of which about 400 thousand hectares are flexible to produce other crops, but still ensure to convert back to rice production if it is necessary.

Rice yield has been continuously improved from 5.3 tons/ha in 2010, increasing to 5.87 tons/ha in 2020. This productivity is much higher than that of ASEAN countries, 2 times higher than Thailand and 1.5 times higher than India. This shows that Viet Nam has comparative advantage in rice production. However, in recent time, the ability to increase rice yield in Viet

Nam nearly reached its limit. Rice production is still concentrated mainly in the Red River Delta and the Mekong Delta (in terms of area, output and productivity), of which the Mekong Delta accounts for 55% of the cultivated area and over 90% of export rice in the country.

Figure 9: Rice production in Viet Nam in the period of 2010-2020



**** The annual rice cropping area (in this figure) equals: the total rice planting area of all crops of a year. In arceal area, rice is cropped 1-2–3 times per year in Viet Nam.*

Source: GSO, 2021.

Rice variety structure has also been changed drastically with increasing certified varieties and high-quality varieties. The proportion of area using certified varieties reached 60-65%. By 2019, the proportion of fragrant rice and specialty rice accounted for 18%, and high-quality rice accounted for 42% *(Department of Crop Production, 2020)*. Many high-value and high-quality varieties have been put into production such as RVT, Dai Thom 8, OM 5451, ST23, ST24 and ST25. In the world rice contests, Viet Nam ST24 rice won Top 3 “World’s Best Rice” prize in 2017, and ST25 won the first prize in 2019.

In order to attract enterprises to purchase rice, the Government has worked with provinces to promote the building of concentrated large fields, thereby applying advanced techniques to produce agricultural products in large quantities according to certified quality standards. The total production area of the large rice fields reached 516.9 thousand ha (accounting for 89.2% of large fields area of all crops). Mekong Delta has the largest large-field area with 427.8 thousand hectares, accounting for 73.9% of the country’s large-field production area. Accordingly, many link models between enterprises and rice-growing households with market-leading role of enterprises have been formed and concentrated in the Mekong Delta and the Red River Delta. Export processing enterprises have participated in building material areas, providing inputs and technical staffs to assist farmers in implementing an unified farming process and ensuring product quality. The rice after harvesting is directly purchased and consumed by these enterprises.

To improve quality and proactively meet the needs of markets, many safety standards and production processes (reduce seed use, save water, reduce use of pesticides) are promoted, such as GlobalGAP, VietGAP, organic standard, "3 decreases-3 increases" method, "1 must-5 decreases" techiniques, improved rice intensification (SRI) techniques, alternating "wet-dry" irrigation process, using seeds with new climate resilience characteristic, etc. These techniques have also helped to protect the environment, reduced greenhouse gas emissions and increased resistance to weather conditions.

Thanks to the application of post-harvest technology (combined harvester, advanced rice processing technology, especially the technology of color separation and rice polishing) and the improvements of rice storage and preservation, the post-harvest loss rate of rice decreased from 11-13% in the past to about 7-9% (Tran Xuan Dinh, 2021).

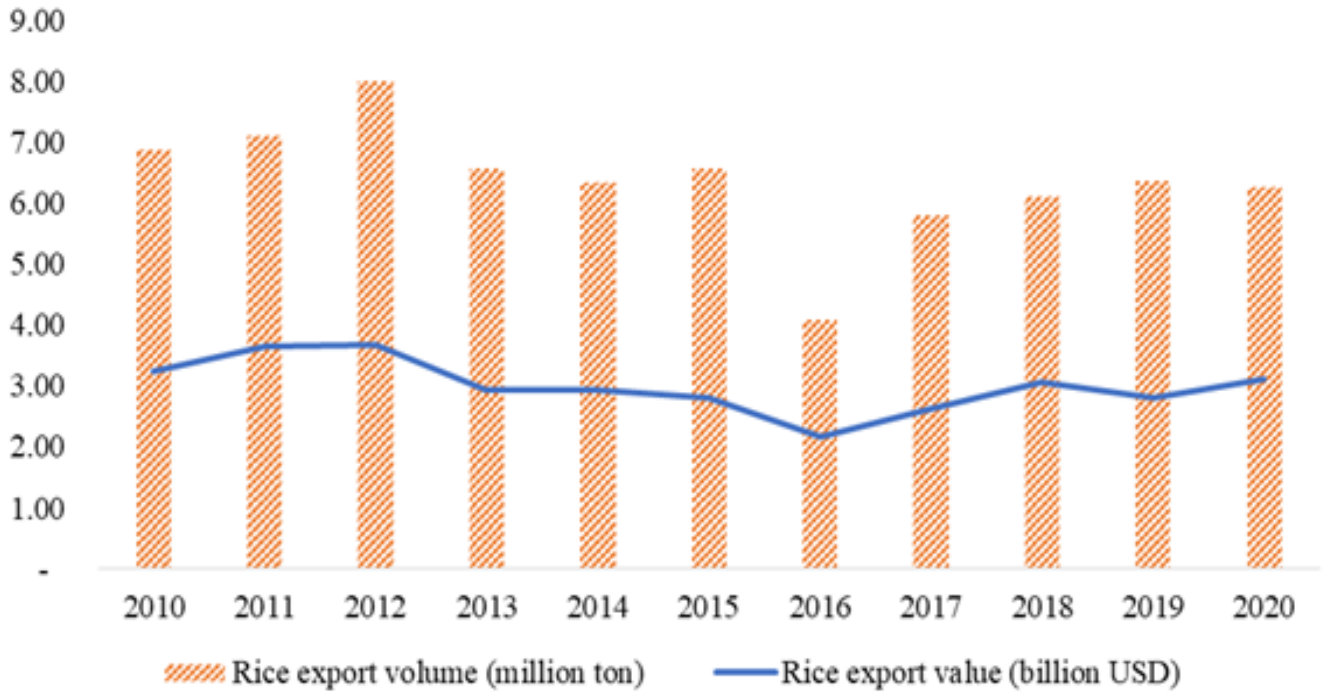
Rice processing sector has attracted many enterprises and individuals to serve domestic consumption and export. There are about 600 industrial-scale rice processing establishments nationwide, mainly located in the Mekong Delta (accounting for over 95%). Particularly in the Mekong Delta, the total capacity of rice drying accounted for about 55% of the total national output, the total milling capacity reached 13.5 million tons/year, accounting for 60% of the country's processing output with about 560 rice mills, in which 3% of them has a capacity of over 100,000 tons of paddy rice/year, 61.5% of 10,000 tons/year. The rice and paddy rice storage system reached 6.7 million tons, of which rice storage stocks accounted 1.5 million tons. In the past 10 years, many large enterprises have invested in closed, continuous and synchronous processing systems to actively process and improve rice quality. In addition to improving drying and peeling technology, enterprises have invested in sorting and packing lines by volume for easy consumption in markets. In general, the level of rice processing technology is average, with many advances compared to other countries in the region[17].

Processed products also began to be diversified such as brown rice, dried rice, rice flour, rice noodles or rice milk, high quality organic rice to meet the needs of domestic consumers and export. The use of by-products is also focused by enterprises and processing facilities such as rice husk coal, essential oil from rice bran. Some other products are being researched and developed from organic rice such as beauty care products (rice essential oil, rice flour for skin care, etc.).

In rice trade, the past 10 years have marked many successes in rice export as Viet Nam continuously maintained its position as one of the three largest rice exporters, accounted for about 15% of the total rice export volume of the world. The volume of rice exports increased sharply during the period before 2012, peaking at more than 8 million tons (worth more than 3.6 million US dollars) in 2011-2012. Since 2012, Viet Nam has continuously exported about 5-6 million tons of rice with a value of 2-3 billion US dollars per year.

[17] *Results of the survey to assess the technological level, AgroTrade 2017.*

Figure 10: Viet Nam's rice export in the period of 2010-2020

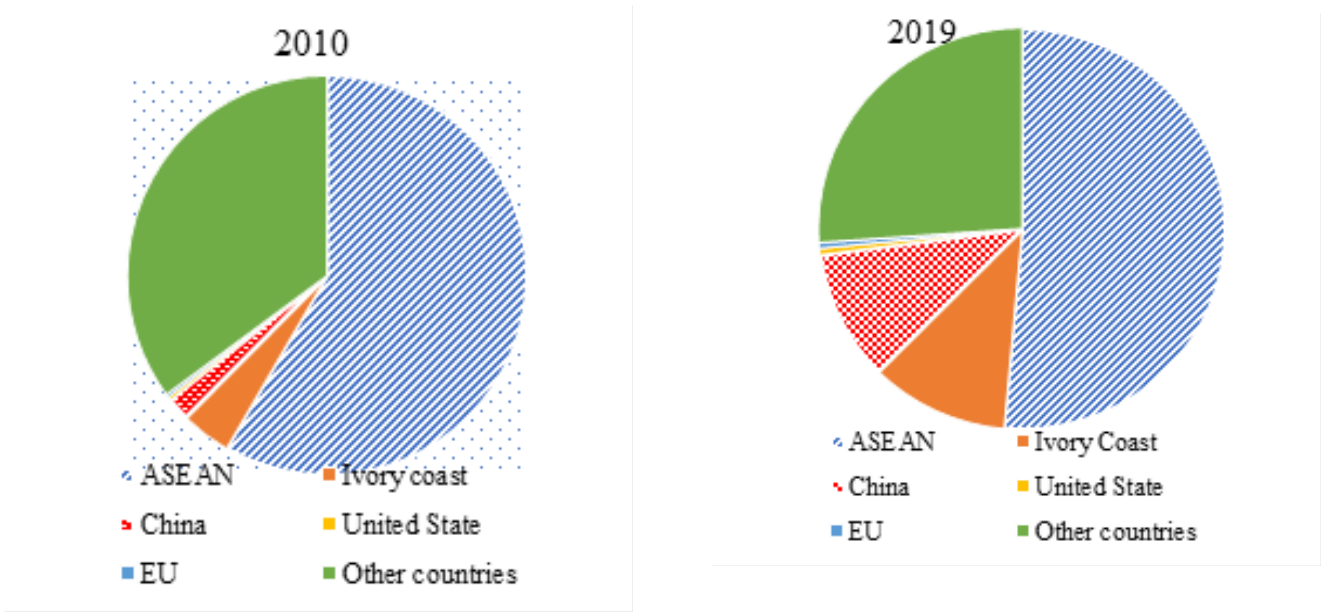


Source: General Customs Office

Viet Nam's rice markets have been diversified and expanded with 95 countries in 2005 increasing to 107 countries in 2010 and has now exported nearly 150 countries and territories. In which, the Asian market (ASEAN, China, etc.) is the main market (accounting for over 65% of total export rice value), followed by European Union, America and Africa. In particular, China annually imports about 1.5-2 million tons/year, accounting for one-third of total Viet Nam's export rice volume. Since 2017, China has also strengthened stricter rice import control when withdrawing the permits of more than 100 enterprises due to violations of regulations on plant quarantine[18]. Besides, Viet Nam has been facing great competition in these markets with big rice producers in the world such as Thailand and India.

[18] *https://Viet Nambiz.vn/xuat-khau-gao-bo-tieu-ngach-chuyen-sang-chinh-ngach-76308.html*

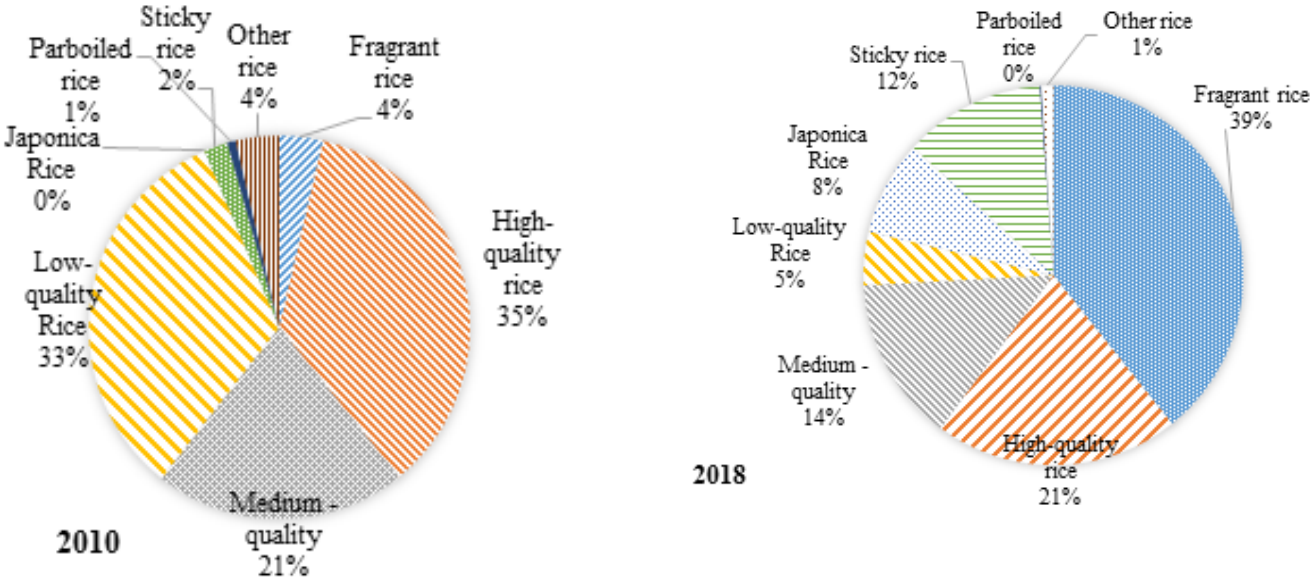
Figure 11: Structure of Viet Nam's export rice value by market



Source: General Customs Office 2020.

The structure of export products has been changing in the direction of increasing the proportion of high-quality rice to 50% (fragrant, sticky, organic, medicinal, 5% broken rice) and reducing the proportion of meium and low quality rice. In addition, Viet Nam has started to export Japonica rice (Japanese rice) to the Japan and South Korea for 5 years.

Figure 12: Structure of Viet Nam's rice export by type



Source: Viet Nam Food Association.

3.1.2. Limitations

In rice production, Viet Nam has not yet selected the main and stable rice varieties/seeds for each production area in the country. Now, Viet Nam has over 200 different rice varieties. As the result, Viet Nam's export rice comes from many different varieties, the synchronicity of exported rice is not high, so the added value and the selling price is quite low. This has not yet created competitive advantages for the rice sector. Meanwhile, countries have focused on developing high quality types of rice with clear brands in the world market (such as Thailand, Cambodia).

Production scale of farmers/producers is small with area of less than 0.5 ha per household, so it is difficult to apply mechanization at all stages of production. Rice production is still unsustainable because producers ussually use high quantity of inputs and does not follow to safe standards in production (water, fertilizers, and pesticides), which is exposing to risks from climate change, natural disasters, drought, saltwater intrusion, and floods.

In the value chain, the link between enterprises and farmers in most provinces is not sustainable and based on many middle stakeholders. Transportation and trading transacstions in rice value chain in production areas mainly depend on traders and "middle-mans". The number of enterprises participating in linked contracts to consume rice products is limited. These contracts is in small quantity and is seasonal. The sustainability of contracts is very weak when many contracts are terminated and broken by both sides of enterprises and farmers/producers. Rice production is stable in ouput quantity but unstable in selling price.

The preserving and processing infrastructure and facilities for rice is still insufficient. The system of cold and cool storage stocks does not met current needs and is mainly used to preserve seeds. There are few enterprises and factories having modern storgare systems such as silo system. Therefore, the post-harvest loss rate in rice processing and milling is still high (7-9%) and quality is usually reduced during storage and processing (Tran Xuan Dinh, 2021).

In rice trade, Viet Nam's rice export is often affected by many factors such as the world's supply and demand, changes in import market policies, strong competition with exporters such as India, Thailand, Cambodia, Pakistan, etc. Viet Nam rice products are still not known to most end consumers in other countries, so they are at a disadvantage compared to Thai and Cambodian rice. Currently, Viet Nam is implementing a rice brand development project but has not brought many breakthroughs. By the end of 2020, Viet Nam had not exported any rice order bearing the rice brand "Viet Nam Rice".

Rice exporters still face with many difficulties due to lack of concentrated export contracts with large quantity (excepting the centralized contract with Cuba) to ensure stable domestic producing and processing activities In export activities, governmental centralized contracts[19]

[19] *These contracts were assigned to the Viet Nam Food Association (VFA) to manage and distribute to the members of the association, including VINAFOOD I and VINAFOOD II who are the leading enterprises of VFA. These enterprises mainly participate in the final stages of export activities and rely heavily on intergovernmental contracts (G2G).*

have been reducing, enterprises must really compete to each other in export markets and seek new export markets. Export price fluctutation by period causes merchants to unsuccessfully negotiate for selling prices. Since the end of 2019, due to the impact of the COVID-19 pandemic, Viet Nam's exporter have also faced many difficulties due to interrupted supply chains, lack of empty containers and skyrocketing freight prices, reducing the competitiveness of Viet Nam's rice. On the other hand, inputs import for rice production was also greatly affected, input prices increased by 20-30% and did not meet production demand promptly (Center for Agricultural Policy, 2020).

The improvement of rice quality led to an increase in the average FOB export price of rice[20], but it was not stable. Many consignments have not met with food safety and plant quarantine standards. In 2018, Viet Nam returned 23 shipments of rice and rice-based products from 6 enterprises by the US, and the EU returned 1 batch of rice flour and 1 batch of instant pho due to poor quality and specifications. The causes of returns are mainly due to residues of pesticides exceeding the allowable threshold, not properly labeled (lack of information), unlabeled, using unqualified packaging, and is rated as unsafe. This shows the quality of Viet Nam's rice and the self-inspection of quality and product specifications is still a big problem that need to be solved.

Table 1: Number of rice and rice product orders refused by the US, EU, and Japan markets in 2018 by exporter

Markets	Exporter: Viet Nam	Exporter: Thailand	Exporter: India	Total of rice orders in the world denied by importers
US (FDA)	23	3	109	179
EU (RASFF)	0	3	10	47
Japan (MHLW)	0	12	0	33

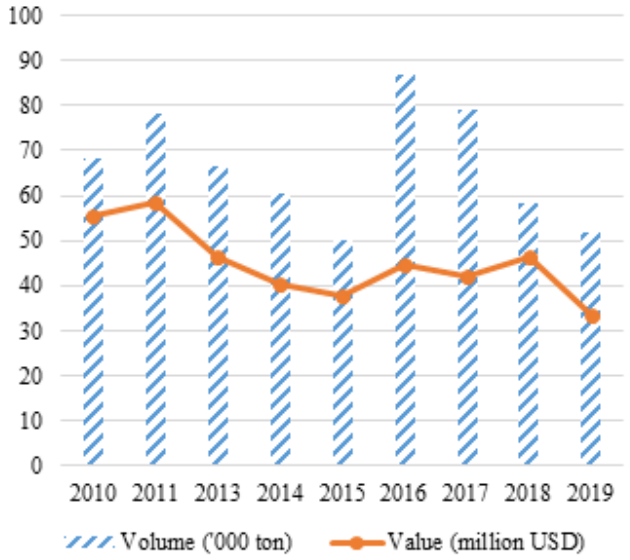
Source: Collected from FDA, RASFF, MHLW.

During previous years, Viet Nam opened its domestic market strongly under commitments of FTAs. Domestic demand for high-quality rice has also increased with improved living standards of people. Therefore, the volume of import rice has increased since 2010, and directly compete with rice produced in the country. According to calculations from UNCOMTRADE data, the major rice suppliers to Viet Nam include China, accounting for 60-70% of the total annual import value, followed by Thailand (accounting for 20%), next to India (accounting for 5-9%), and Laos (5-8%). In particular, Thailand has invested in distribution system in Viet Nam (acquired Nguyen Kim, Metro, and Big C systems) and is currently focusing on researching and building a logistics system (focusing on southern provinces such as Ho Chi Minh city and Binh Duong). This helps Thai goods, including rice, to penetrate Viet Nam market easily. Therefore, although Viet Nam is a large rice exporter, it still have to face strong competition in term of high-quality rice in the domestic market.

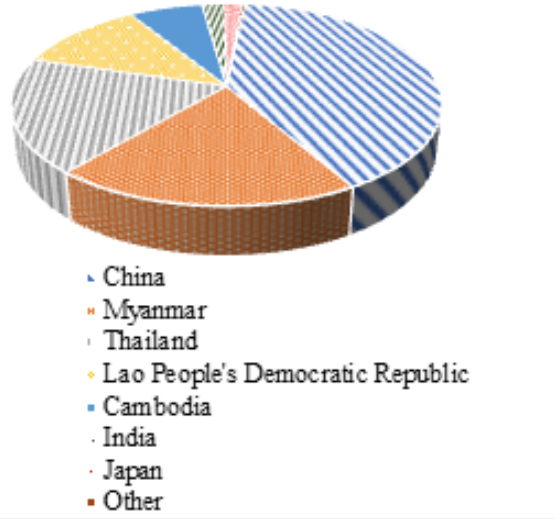
[20] *https://baodautu.vn/xuat-khau-gao-duoc-gia-nho-tang-phan-khuc-chat-luong-cao-d89394.html*

Figure 13: Viet Nam's rice import in the period 2010-2019

Rice import volume and value of Viet Nam



Countries exporting rice to Viet Nam



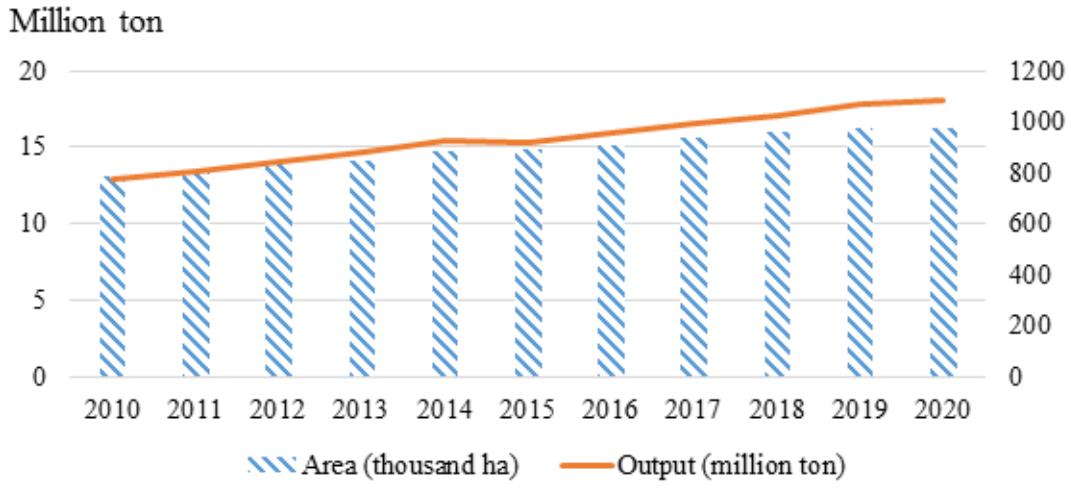
Source: UNCOMETRADE.

3.2. Vegetable and fruit

3.2.1. Achievements

The area and gross production output of vegetables and fruits have continuously increased over the past 10 years. Vegetable production area is about 975 thousand ha in 2020, an increase of 192 thousand ha compared to 2010, an average growth of 2.2%/year. Accordingly, the output also increased continuously, reaching 17,764 thousand ton and increasing by 4.8 million ton, equivalent to 1.4 times higher than 2010, the average output increased by 3.4%/year (GSO, 2020).

Figure 14: Output and area of vegetables in the period of 2010-2020



Source: GSO & MARD.

The area of fruit trees nationwide in 2019 reached 1.06 million hectares, an increase of 287,000 hectares compared to 2010, continuing to increase to 1.1 million hectares in 2020. The average yield of all fruit trees currently now more than 10 tons/ha, up 0.8 tons/ha compared to 2010 (9.2 tons/ha). Total fruit production in 2019 reached about 12 million tons, an increase of more than 5 million tons compared to 2010. Many large-scale fruit production areas were formed, such as dragon fruit, lychee, banana, citrus (pomelo, oranges), pineapples, mangoes, longans, etc. The spreading of crops on fruit trees is carried out, thus creating high economic efficiency, significantly reducing the pressure of consumption of the main crop. The production value of fruit trees contributed to crop growth in the period of 2010-2019 is 23.0%, of which some trees make a big contribution such as dragon fruit 4.42%, durian 4.5%, orange 3.35%, mango 2.09%, pomelo 1.99%, banana 1.44%.

Table 2: Production output and area of main fruits in Viet Nam

Area (thousand ha)										
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Citrus	75.3	68.8	67.5	70.3	78.5	85.4	101.3	112.6	120.8	120.2
Coconut	39.7	40.5	40.7	40.5	41.4	39.7	40.8	45.6	47.1	46.7
Banana	119.8	121.9	123.6	126.8	128.8	133	138	140.2	144.8	150
Mango	87.5	86.4	85.6	85	83.9	83.7	86.8	92.7	99.6	104.8
Longan	88.4	86.2	79.4	78.3	75.5	73.3	73.5	75.7	78.8	80.6
Lychee. Rambutan	101.7	100.9	97.8	94.7	92.7	90.6	87.5	84.4	83	79.2
Pomelo	46.2	45.2	45.7	45.3	46.5	51.7	60.7	74.2	85.2	97.9
Dragon fruit	14.9	23	25.2	28.7	37.2	42.1	44.5	48.9	55.4	60.6
Output (thousand ton)										
Citrus	726.6	702.7	704.1	706	758.9	727.4	806.9	948	1055	1245.7
Coconut	512.3	530.6	571.9	585.1	591.4	578.2	551.7	610.7	674	707.9
Banana	1635.3	1743.3	1796.7	1892.5	1857.6	1943.3	1963.9	2066.2	2104.5	2194.2
Mango	580.3	687	665	680.9	679.1	702.9	728.1	788.2	788.5	839
Longan	573.7	596.7	542.5	544.1	519.2	513	503	497.4	541.4	527.6
Lychee. rambutan	522.3	725.3	648.5	629.2	696.2	715.1	648.4	565.1	719.3	622
Pomelo	400.5	424.3	433.5	439.6	442.8	471.4	504	571.3	642.9	818.9
Dragon fruit	328.2	468.3	486.1	517.5	624	707.6	833.2	952.8	1074.2	1250.2

Source: GSO.

Meeting the requirements on product quality of the markets, many vegetable and fruits farmers have changed from traditional production method to modern production under certified standards and processes, improved added value and made production decisions according to the market demand, adapting to climate change and promoting the climate and land advantages of each region.

Many fruits have been developed in large-scale specialized concentrated areas and

following to certified standards for export such as the Mekong Delta (Tien Giang, Dong Thap, Ben Tre), the Central Highlands, the North Central region, the Northern Midlands and Mountains (Son La, Bac Giang, Hung Yen), etc.

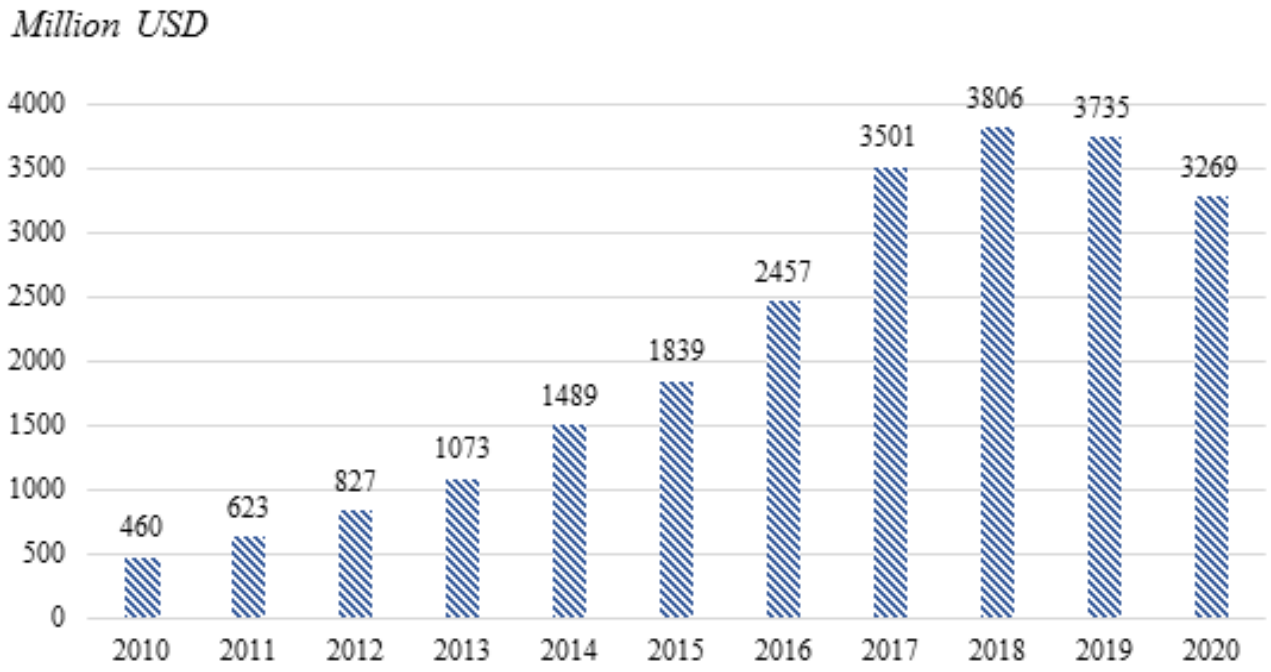
The provinces have also focused on supporting development of geographical indications, growed fruits with regional characteristics such as Thanh Ha lychee (Hai Duong), Luc Ngan lychee (Bac Giang); Green skin pomelo (Ben Tre), Hoa Loc Cat mango, Cat Chu mango (Dong Thap province), sweet tangerine (Tra Vinh), oranges (Ham Yen), dragon fruit (Chau Thanh), etc. In which, there are 18 geographical indications for fruit sector (in 39 geographical indications) are protected by EU countries such as Tan Cuong tea, Tan Trieu pomelo, Luc Ngan lychee, Phuc Trach pomelo, etc (according to commitments of EU under EVFTA). With the grant of geographical indications, the value of many fruit and vegetable products has increased significantly and has been trusted by consumers.

In the fruit and vegetable sector, many enterprises are interested in investing in technology infrastructure, modern production techniques and processing technology. In the recent 5 years, many enterprises have focused on investing in new production and processing lines, advanced and modern technology, increasing the proportion of processed fruit and vegetable products and diversifying products for export (juice, dried fruit, fruit powder, etc.).

Markets for Viet Nam's fruit and vegetable have been expanded over previous years. Viet Nam's vegetables and fruits have been exported to nearly 60 markets around the world. The domestic market consumes about 80% of fruit and vegetable production. The export turnover of vegetables and fruits increased continuously in the past year, reaching 3.2 billion US dollars in 2020, increased 6.1 times compared to 2010, contributing 7.8% of the total export turnover of agricultural products of Viet Nam. Vegetable has become one of 13 key export commodity groups of Viet Nam in AFF (General Customs Office, 2020).

The types of vegetables and fruits of Viet Nam for export are quite diverse. More than 30 kinds of fruits are exported, of which: dragon fruit accounting for 50% in total export volume, pineapple: 4%, lychee: 4.3%, longan: 2.8%, mango: 1.7%, rambutan: 1.6%, etc. Fruits and vegetables have been exported to high-quality markets such as the US (36 types of vegetables and fruits), EU, Australia, Japan, and Korea (Department of Crop production of Viet Nam, 2021).

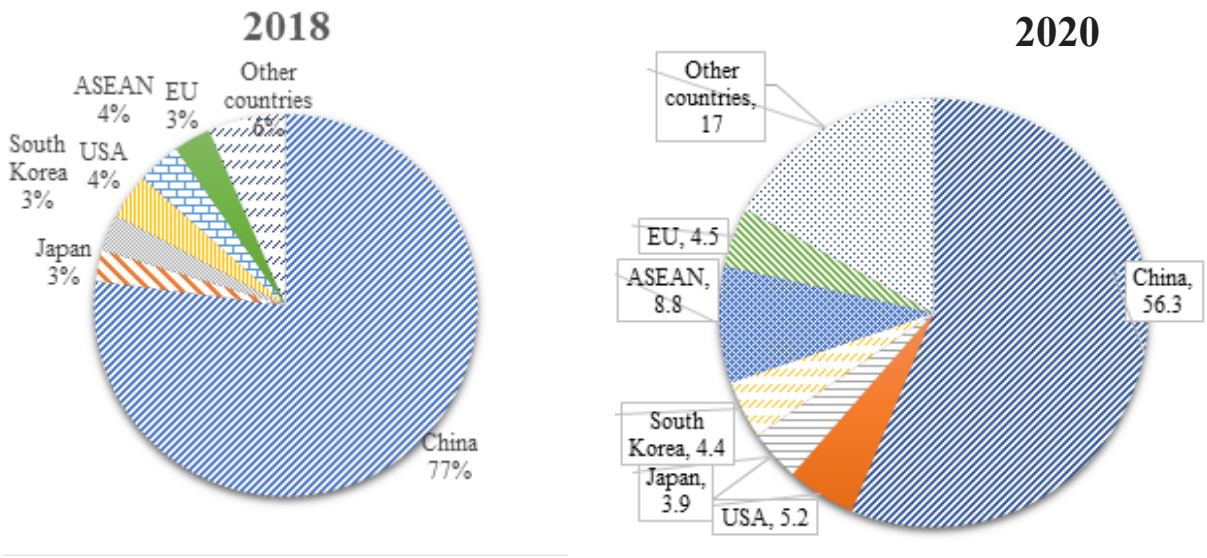
Figure 15: Viet Nam's fruit and vegetable export value in the period of 2010-2020



Source: Ministry of Industry and trade.

The structure of export markets tends to gradually shift to new and high-end markets, reducing dependence on Chinese market. The structure of export markets has changed positively when reducing dependence on the Chinese market and increasing the proportion of export value to the EU, USA, Korea, and Japan. However, China is one of biggest markets. China has been the largest fruit and vegetable importer from Viet Nam with a proportion of 56.3% (the proportion decreased, but the import value still increased). Since 2019, vegetable and fruit export to China have faced more difficulties due to the China's policies in inspection, quality supervision and traceability in term of Viet Nam agricultural products and due to the impacts of the COVID-19 pandemic. The CPTPP and EVFTA have come into effect, which have created driving forces for export of vegetables, fruits, and processed products to tradinational and new markets.

Figure 16: Value export structure of Viet Nam's export fruit and vegetable by markets in 2020



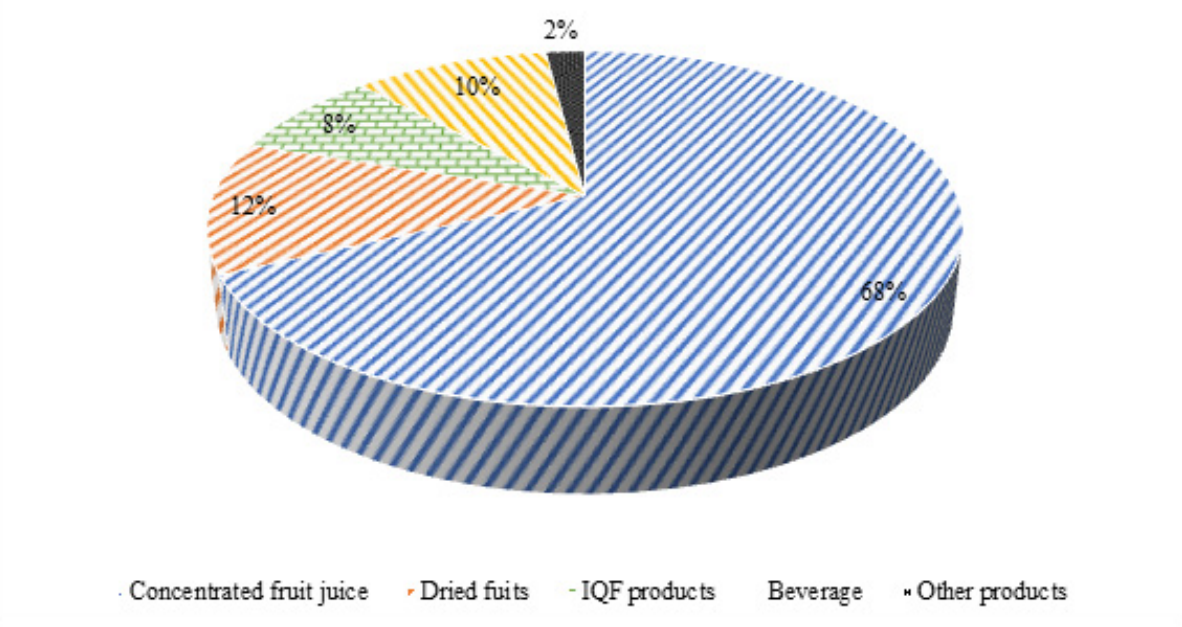
Source: Ministry of Industry and Trade, Viet Nam.

To support for verifying the production area code and origin traceability for vegetable and fruit for export, the Ministry of Agriculture and Rural Development has promoted the issuance of planting unit codes[21]. By the first quarter of 2021, MARD has issued 998 area codes for fruits to be exported to the US, Australia, Korea, Thailand, Japan, EU, and China. 47 packing facilities have also been granted codes to export products to these markets. Implementing the production area code and packing facility code is currently promoted by MARD and provinces.

Export vegetable and fruit have improved in both quality and value. Many enterprises has begun to focus on and raise their investment in processing of fruit and vegetable products. According to the Fruit and Vegetable Association, Viet Nam's fruit and vegetable have about 150 industrial-scale processing facilities/plants with a design processing capacity of about 1 million tons of products per year. Currently, in average, the design capacity utilization rate reaches about 56% in a year. In the fruit processing sector, many enterprises have been located in 28 provinces and cities[22]. In which, the Northern provinces have 71 enterprises, accounting for 49%; The Central provinces have 18 enterprises, accounting for 12.4%, the South ones have 56 enterprises, accounting for 38.6%. Through the application of technology in preliminary/deep processing and preservation, the fresh preservation time has been improved, reached from 30-40 days. Post-harvest losses of the fruit and vegetable sector are currently about 20-30%.

[21] *Production area code is an identification code verified by the Ministry of Agriculture and Rural Development for a production area, to supervise and control the production and quality status of designated area.*
[22] *Provinces with more than 10 fruit and vegetable processing enterprises: Hai Duong, Hung Yen, Bac Giang, Lam Dong and Ho Chi Minh City.*

Figure 17: Structure of processed fruit products



Source: MARD.

In general, in recent years, our country's fruit exports have grown in many markets. It is forecasted that in the coming years, the export market will continue to be stable and expand with 5 main regions: (1) China; (2) ASEAN countries, Hong Kong, and Taiwan; (3) Japan, Korea; (4) United States and Canada; (5) EU. Besides, there are new and potential markets such as India, UAE, Australia and New Zealand.

3.2.2. Limitations

The majority of fruit and vegetable farmers are relatively small, leading to fragmented production. The average size of fruit plantation is from 0.2-0.6 ha/household. The mechanization in production is still low and not comprehensive, not synchronous across regions. Applying mechanization in production and harvesting of perennial industrial plants and fruit trees is still limited due to the characteristic of production, plantation area. The post-harvest loss rate was high (about 20-30%) (Department of crop production, 2021).

Fruit and vegetable products are seasonal in nature and are mainly consumed in fresh form, with low added value. Therefore,at the harvesting time, and the number of products required to be consumed is very large, putting pressure on the market, typically lychee, longan, and winter vegetables. Many localities are still hesitant in converting inefficient rice land to fruit trees because of the investment problems and concerns about the output market for the products. The application of technology and investment in deep processing plants is still limited due to high investment costs. The supply of raw materials is not uniform at every period in the year and among production regions. Many enterprises still lack raw materials for processing.

The organization and management of production along the value chain has not really met the high export standards. The link between production, consumption and quality control of

vegetables and fruits in Viet Nam is still weak and unsustainable. The fruit and vegetable value chain has many intermediaries, mainly through multi-level traders, and there is no suitable profit distribution for producing households. The linkages between actors in the fruit and vegetable value chain are quite loose, mainly by oral and seasonal contracts but not sustainable. Many enterprises are not interested in linking with producers/farmers. The distribution and consumption system are not professional and lack of links among stakeholders. The technology and facilities of preservation and post-harvest handling is slowly improved, and the post-harvest loss rate is still high.

The impact of climate change, the situation of pests and diseases are seriously affecting the productivity, output and quality of vegetables and fruits in Viet Nam. In particular, the control of residues on manufactured products is increasingly complicated, so agricultural export face many difficulties from foreign markets.

The proportion of vegetables and fruits exported to high-value markets is still limited, and the degree of dependence on the Chinese market is very high. In 2020, the export value of vegetables and fruits reached 3.26 billion US dollars. In which, China is the largest fruit and vegetable importer, accounting for 56.3% of Viet Nam's total fruit and vegetable export turnover (equivalent to 1.84 billion US dollars). This statistic data shows the dependence of Viet Nam fruit and vegetable on the market is significant. The second largest market is the United States, with a value of 168.8 million US dollars (5.2%) and an increase of about 12.5% compared to 2019, followed by Thailand with 157.2 million US dollars, South Korea 143 million US dollars, and Japan 127.7 million US dollars (General Customs Office, 2021). Scale of most fruit and vegetable producers in Viet Nam are still small. They often lack information and knowledge, lack of resources to meet and comply with food safety and hygiene standards, plant diseases control of high-quality markets such as the US, EU, Japan, etc.

Logistics cost for exporting fruits and vegetables is quite high, heavily dependent on foreign enterprises. The average logistic cost for vegetables and fruits is about 29.5% in the value structure of the export chain. Especially in the context of the COVID-19 pandemic, the procedures of transporting and clearing custom are longer and more complex than before due to strict disease control requirements. The storage time at ports increased that reducing the quality of fruits and vegetables significantly. The logistics cost has increased by 30-200% since the end of 2020 due to the impact of the pandemic (Ministry of Industry and Trade, 2020a). In addition, the infrastructure in concentrated production areas has not been able to keep up the growth rate of production such as system of roads, transporting vehicles and facilities.

Fruit and vegetable exports always face many technical barriers of importing countries, especially requirements on quarantine, food safety and hygiene, marketing standards (packaging, labeling, packaging, etc. and product uniformity criteria). To export, Viet Nam producers and enterprises have the expertise to comply with the necessary SPS/MRLs standards and already are certified for International Organization for Standardization (ISO), HACCP, United State Food and Drug Administration (USFDA) or British Retailer Consortium (BRC) as import market requirements. However, there are still gaps in the traceability systems and a lack of farm-level

certification. For example, many European importers require GlobalGAP certificate while there is small number of Viet Nam farmers applying and meeting this standard.

Because of weak quality, some fruits and vegetables were warned, increased inspection frequency, and even returned by countries over past years. From January 1st to May 1st, 2019, Spain refused 8 orders of almonds with origin from Australia, which were processed in Viet Nam, due to excessing aflatoxin limit[23]. In 2018, Japan announced that there were 48 cases of Viet Nam agricultural products being returned after quarantine due to excessing MRLs[24].

3.3. Industrial crops

3.3.1. Achievements

The gross production output of industrial crops tended to grow positively in the past period. Although the area of some sectors (tea, cashew) decreased slightly, the output maintained a good growth thanks to improvement in yields. Compared to the world, the yield of industrial crops in Viet Nam ranks in the top 5 countries with the highest productivity. The production output of Robusta coffee reached 2.63 tons/ha, was 1.5 times higher than Brazil, 3 times higher than Columbia, Indonesia.

Table 3: Production of main industrial crops in Viet Nam

	Indicators	2010	2015	2020
Coffee	Area (thousand ha)	554.8	643.31	680
	Yield (tons/ha)	2.15	2.45	2.63
	Production output (thousand tons)	1100.55	1453	1662.96
Pepper	Area (thousand ha)	51.3	101.62	130
	Yield (tons/ha)	2.38	2.61	2.44
	Production output (thousand tons)	105.4	176.79	268
Tea	Area (thousand ha)	129.9	133.61	121
	Yield (tons/ha)	7.37	8.6	9.46
	Production output (thousand tons)	834.6	1012.92	1021.24
Cashew	Area (thousand ha)	379.3	290.4	298
	Yield (tons/ha)	0.91	1.26	1.21
	Production output (thousand tons)	310.5	352.03	336.76
Rubber	Area (thousand ha)	748.73	985.63	935
	Yield (tons/ha)	1.71	1.68	1.64
	Production output (thousand tons)	751.6	1,012.75	1200

Source: GSO.

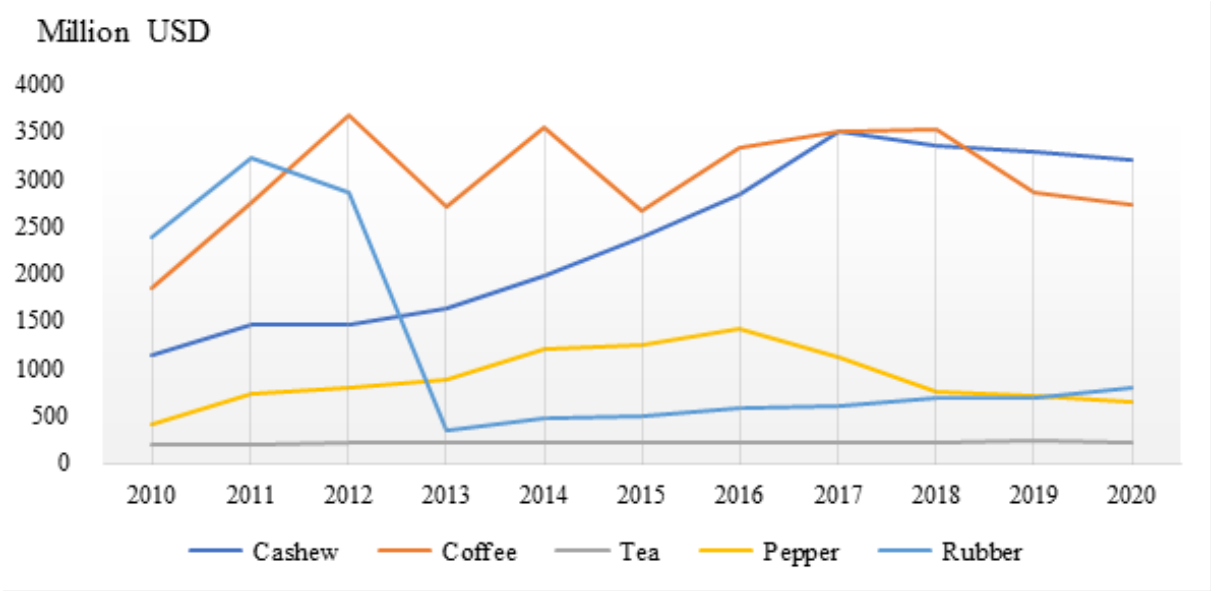
[23] *Nhiều lô hàng nông - thủy sản của Việt Nam bị EU từ chối, giám sát (soctrang.gov.vn)*

[24] *Tuân thủ quy định kém, nông sản xuất khẩu nhận điểm trừ (baodautu.vn)*

Viet Nam is one of the largest producers in term of industrial crops in the world, with the production capacity of 268 thousand tons for pepper that contributing to 40% of the world's production output, 1.2 million tons of rubber, and 1.6 million tons of coffee in 2020 (GSO, 2020).

The industrial crops contributed many export products of over 1 billion US dollars annually, contributed significantly to export turnover growth rate, helped Viet Nam maintaining an important position in the world market. Five key products (coffee, pepper, cashew, tea, rubber) have contributed over 18% of the total export value of Viet Nam's AFF. In 2020, Viet Nam exported 2.7 billion US dollars of coffee, 3.2 billion US dollars of cashew, 0.8 billion US dollars of rubber, and 0.66 billion US dollars to the world market (General Customs Office, 2020).

Figure 18: Export value of Viet Nam's main industrial crop products



Source: General Customs Office

The export market of major industrial products is continuously expanded. For example, tea has been exported to 74 countries; coffee has been exported to over 100 countries, cashew to 90 countries. On the other hand, industrial crop products have retained an important position in the world market. For many consecutive years, Viet Nam's cashew kernel exports topped the world, accounting for 80% of the world's cashew kernel exports (UNCOMTRADE, 2020).

Processing products has been continuously diversified and improved their quality to raise added value for export. Typically, coffee products have been diversified through processing, including: (i) roasting coffee; ii) roasting and grounded coffee (in powder and insoluble forms); iii) instant coffee flavor; iv) mixed powder coffee (combined with sugar and milk); v) ready-to-drink and instant coffee. Some enterprises have processed coffee capsules with high content of coffee essence, compact structure and be used by specialized machines for direct consumption. In term of tea processing, enterprises have invested in many technological lines of tea processing with a high degree of mechanization to improve quality and uniformity. In particular, enterprises and production establishments have actively diversified products and improved added value,

mastered techniques of growing, cultivating, and processing matcha tea and instant tea from fresh tea in material areas of the country. Many new products are being welcomed by markets that improving value of the tea sector. Particularly, in the cashew sector, Viet Nam has been at the forefront of cashew processing technology for export.

3.3.2. Limitations

Production area of many industrial crops has not been comply with the plans issued by the Government, that was one of reasons causing oversupply situation and a sharp drop in selling and export prices. Currently, the coffee area has exceeded the planned area by 145,000 hectares, equivalent to about 29% of planned area, the rubber area exceeded by about 180,000 ha, equivalent to about 22.5%, and pepper area exceeded by 48,000 hectares, equivalent to double the planned area (GSO, 2020). The expansion of the production area exceeding plans caused difficulties in quality control and consumption. The selling prices of the products usually drop sharply at the harvesting time and export prices often decrease when domestic production reaches high output quantity. For example, pepper export price decreased from $2,512/ton (in 2019) to $2,315/ton (in 2020), equivalent to a decrease of 7.8% (Ministry of Industry and Trade, 2020).

Processing capacity of industrial crop products is still weak. Typically, in term of cashew sub-sector, Viet Nam has about 3,000 cashew processing factories, of which small-scale processing factories account for 70-80%. Small-scale cashew processing factories mainly process cashew nut preliminarily for large factories, using rudimentary machines, low degree of mechanization, using simple labor and paying low salary.

The area of industrial crops increased in the period of 2010-2020, but production costs also tended to increase. Current traditional farming methods still have used higher quantity of inputs (fertilizers, irrigation, pesticides, etc.) to maintain yield when the land is degraded, and new diseases and pests occurs. As a result, industrial crops (such as coffee) are depleted and lost production capacity. Groundwater resources have been degraded, and soil pollution has been occurred in many production areas. Diseases and pests that are resistant to antibiotics are common. Many households produce at a small and scattered scale, so the quality is low and unstable.

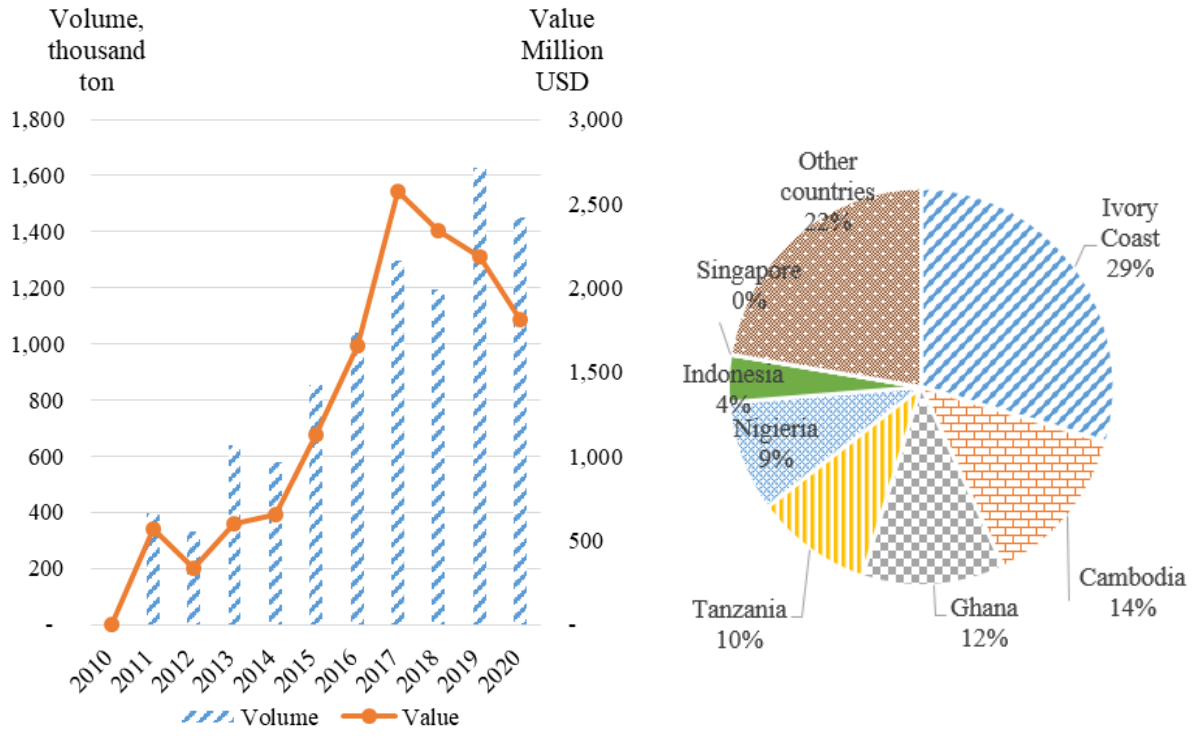
The processing capacity of industrial plants is still quite weak. In the cashew sector, there are about 3,000 cashew processing factories in the whole country, of which small-scale processing factories account for 70-80%. Small-scale cashew processing factories mainly preliminarily process cashews for large factories, using fairly rudimentary machines, low degree of mechanization, using simple labor and paying low prices. The main processed product is still cashew kernels. In the global cashew nut value chain, Viet Nam only accounts for about 30% of the time, while mainly exporting low-value pre-processed cashew kernels[25].

In addition, the cashew-processing sector is also highly dependent on imported raw materials. Cashew nuts produced in Viet Nam are considered to be of the best quality in the

[25] *Viet Nam's export processing cashew kernels are priced at about 10 US dollars per kg, while fin*ished cashew *kernels reach consumers in other countries are about 30 US dollars per kg.*

world, but only meet a very small part in processing. Viet Nam is importing about 70% of raw cashew nuts for processing needs. Therefore, over the past 10 years, Viet Nam's cashew sector has always been the world leader in exporting processed cashew nuts, but it is still a huge importer of raw cashew nuts with a turnover of over 1 billion US dollars (General Customs Office, 2020). Due to big dependence on import material sources, cashew-processing sector is greatly affected by the production status and policy of foreign big cashew nut producers. According to Viet Nam's Cashew Association (Vinacas), at the beginning of 2020, in Long An, 12/33 cashew nut processing enterprises and factories closed their acitivities. In Binh Phuoc province, about 70%-80% of cashew processing factories stopped working. In some other provinces, many cashew factories also fell into difficult status due to lack of raw material for processing. In addition, the cashew processing sector for export has been under great pressure from policies to support cashew farmers and restrict export of raw cashew nut of African countries such as Ivory Coast, Tanzania, etc. (Ministry of Industry and Trade, 2020)[26].

Figure 19: Viet Nam's raw cashew nut imported for domestic processing



Source: UNCOMTRADE.

*Similar to other agricultural products, most of industrial crop products for export has been still raw with low content of processing. The proportion of processed products for export from indus*trial crops was low. In the coffee sector, about 80% of coffee produced in the country is to export (Department of crop production, 2021). In the meantime, Viet Nam mainly exports green coffee (raw, unroasted, and ungrounded products). Viet Nam's ground-roasted coffee and

[26] *Report on Export and Import in Viet Nam for 2020, MOIT*

instant coffee for exports took only 5% of the total exported coffee. Recently, Viet Nam's coffee export value has tended to decrease; the sector has lost 3 billion US dollars since 2019. One of the reasons for the decrease in exports is due to the large import markets of Viet Nam's coffee. Viet Nam suffered great losses due to the COVID-19 pandemic. Since the end of 2020, shipping costs to other markets have significantly increased, has also increased the export price of coffee. In the pepper sector, 90% of Viet Nam's export pepper is raw, and 10% is processed pepper. Similarly, over 90% of exported cashew is preliminary processed (UNCOMTRADE, 2020).

Viet Nam's export prices of industrial crop products have been influenced greatly by price movements and demand-supply situations in the world market; and depended on big processing enterprises and producers in foreign partners such as EU. Some commodities often face difficulties in exporting such as rubber and pepper. Viet Nam's rubber export turnover has been fluctuated strongly, unstably. In particular, when the world market's rubber supply exceeded demand for many consecutive years, it has pushed rubber price down and farmers suffered great losses. For pepper sector, Viet Nam has contributed over 40% of the pepper production output and 60% of the total export value of the world, but the export pepper price has depended on partners and fluctuated constantly. In the 2011-2018 period, pepper exports always grew in both volume and value. However, in the 2018-2020 period, pepper export volume increased sharply, but export value decreased compared to previous periods. Pepper export in 2020 reached 288 thousand tons and 666 million US dollars, up 1.2% in volume but down 6.8% in value compared to 2019.

Up to now, selling products after harvesting has met difficulties such as low price, slow consumption, etc. So that, some provinces must cut down production area and convert to other crops. The rubber area in 2020 reached 941.3 thousand hectares and decreased compared to 2019. The pepper area by the end of 2020 was about 130 thousand hectares, a decrease of more than 10 thousand hectares compared to 2019, of which harvesting area was 110 thousand ha.

Export products have not had strong brands in international market. Only coffee products have certain and clear brands (Trung Nguyen, Vinacafe, etc.). Other products such as cashew, pepper, rubber, and tea have not had clear brands and been sold under foreign brands in the world market. The Government and the Ministry of Agriculture and Rural Development have implemented many policies to support brand development, but there has been any significant change. The building and protection of agricultural product brands are still quite confusing, has not yet attracted attention of large enterprises while they have focused on exporting raw products with big quantity.

The quality of industrial crop products are still low due to the lack of uniformity, uneven quality and low proportion of products meeting high standards of markets. In coming years, Viet Nam's export of industrial crops (especially processed products) will have many positive opportunities thanks to free trade agreements. However, technical barriers for import goods of the countries participating in EU and CPTPP are very strict and are updated continuously.

4. The new context affecting crop development to 2030

4.1. Opportunities

International economic integration under new-generation FTAs continues to promote market opening, give many trade and investment opportunities. Up to now, Viet Nam has opened the economy and integrated strongly with 15 signed FTAs and 2 negotiating FTAs. Participating FTAs helps Viet Nam opening new markets under trade commitments. Foreign investors continue to pay close attention to Viet Nam when Viet Nam is the country with many advantages of favorable natural conditions and production resources (land, water, climate, cheap labor) and is a big agricultural-product supplier of the world. The business investment environment has been renewed under the commitments under CPTPP and EVFTA, which will create more force to attract foreign investment. Accordingly, agricultural production capacity and quality will be improved to meet demands of foreign markets, especially high-quality markets such as the US, Japan, EU, Australia, etc.

World market demand remains high with a wide range of crop products and continues to increase. According to the Organization for Economic Cooperation and Development's (OECD) forecast, the world's demand for agricultural products will continue to increase in the coming periods. In the period of 2018-2026, the demand for agricultural products for biofuel production will increase by 3-5% per year, and the consumption of organic products will increase by 16% per year on average. Along with the growth in demand, the structure of the market demand also has been changing along with income growth in the direction of reducing cereal, and increasing fruit and vegetable consumption. The development of the middle-class population have taken place rapidly and they become increasing important customers in the world market. In addition, demand of agricultural raw material for processing sector, especially for biofuel manufacturing, tends to increase fast. At a higher growth of economies, consumers tend to use more and more products that are more environment-friendly and safe, healthy and organic agricultural products, goods according to sustainable standards with the environment, socially responsible goods.

With the change in demand structure in domestic and global markets, along with the economy efficiency from new production models, the production of food crops will be decreased, switching to vegetable, fruit, flower, medical and industrial crops.

Many scientific and technological achievements from the 4th industrial revolution have been strongly applied to the development of production, processing, and trade. The 4th industrial revolution's achievements such as digital technology (artificial intelligence, big data, internet of things, cloud computing), remote sensing technology, biotechnology, new materials, robotics, printing technology 3D, renewable energy open up new development potential for all sectors, create a new thinking stance for the world agriculture sector as well as for Viet Nam's. Advanced S&T advances open up opportunities for the agricultural sector to improve the efficiency of resource management, production management, productivity, food safety and hygiene, and added value improvement for agro-products. At the same time, advances also help to mechanize, automate, and free up labor. In particular, these advances can create a new direction to change

the production organization and link in value chain, which is a difficult bottleneck of the agricultural restructuring process in Viet Nam. Along with international economic integration, Viet Nam has enough grounds to move towards sustainable agricultural development, improve competitiveness for crop products, and increase exports to diverse markets.

The agricultural sector also has certain opportunities from the COVID-19 pandemic when many exporting countries in the world market have to focus their resources to healthy; along with demand for food security is increasing. Currently, Viet Nam is one of the countries controlling the pandemic well while agricultural production activity has been remained stable. At the same time, under the signed FTAs with developing and developed parties, Viet Nam has a better advantage compared to other countries. Viet Nam's crop sector will continue to benefit greatly from the demand for agro-forestry-fishery products from world's market. At the beginning of COVID-19 pandemic outbreak by the end of 2019, Viet Nam has continued to export rice to Malaysia and Singapore, vegetables to the US, EU, Japan, etc. Despite difficulties in logistics and import-export management procedures, Viet Nam has remained a large and strong agricultural exporter in 2 recent years and is likely to grow stronger in the next 5 years.

In the context of the COVID-19 pandemic, climate change, diseases on food crops, and uncertain development in the world market, the big ability in food crops production will continue to bring big new opportunities to Viet Nam. If having a strategic preparation, Viet Nam will maintain a significant position, greatly affect to food balance and food prices in the world market.

4.2. Challenges

In the next 10 years, Viet Nam will also continue to face many difficulties and challenges in the agriculture in general and in the crop sector in particular.

The complicated developments of the COVID-19 pandemic will continue to create many unexpected impacts on the operation of Viet Nam's agricultural supply chains. Since the beginning of 2020, the control of the pandemic has greatly affected domestic and global consumption power. Due to illness, unemployment, loss of income, school closures, etc., people's financial ability to pay for utilities or needs has decreased, which reduce the consumption of agricultural products, putting pressure on big agricultural production countries like Viet Nam. Due to the complicated outbreak of the COVID-19 pandemic, the exchange of goods between Viet Nam and other countries has become more difficult because of the change in import policies and procedures of the countries. For example, China has stepped up strict control on cross-border import and export, traceability of goods, that made more difficulties for goods from Viet Nam to get customs clearance at border gates. Other important trading partners (such as the EU) are tightening controls on import food, which further disrupt supply chains and increase logistic costs. The pressures on costs, fees and taxes on agrienterprises are huge, thus reducing their competitiveness in the market. When export activities are affected, business activities are interrupted, profits of enterprises decline.

On the other hand, challenges from the COVID-19 pandemic have been promoting the application of science and technology, automation in all stages of the supply chain, that will

become the major trend in the coming time. Accordingly, jobs in agricultural supply chains and value chains will be cut, which will create socio-economic pressures for the agricultural sector.

The competitive pressure in using resources among sectors is greater while these resources are limited and degraded. The resources for production growth are increasingly narrowing, such as land, water, and a young workforce when there is competition among many sectors. Industrialization and urbanization continue to develop, requiring more space, clean water, and land. These processes promote competition in natural resources, increase environmental pressures, and increase greenhouse gas emissions and solid waste. Besides, with advances in science and technology using less labour, the risk of a large workforce losing their jobs and returning to agriculture and rural areas needs to be taken into account in the long term. Meanwhile, the rural agriculture sector is accelerating the process of land accumulation and the application of technology will also have less labour demand. Therefore, the pressures in resource use as well as social problems in rural area are increasing.

Moreover, the upper regions of Mekong River have been significantly developed hydropower development on its mainstream (China, Laos, Cambodia, Thailand). At the same time, the use of Mekong River water on a large-scale for agricultural production tends to increase. Those will reduce the freshwater of Mekong River, leading to decrease of floods, so crop production in the major commodity producing region – Mekong River Delta of Viet Nam – will be affected in the near future.

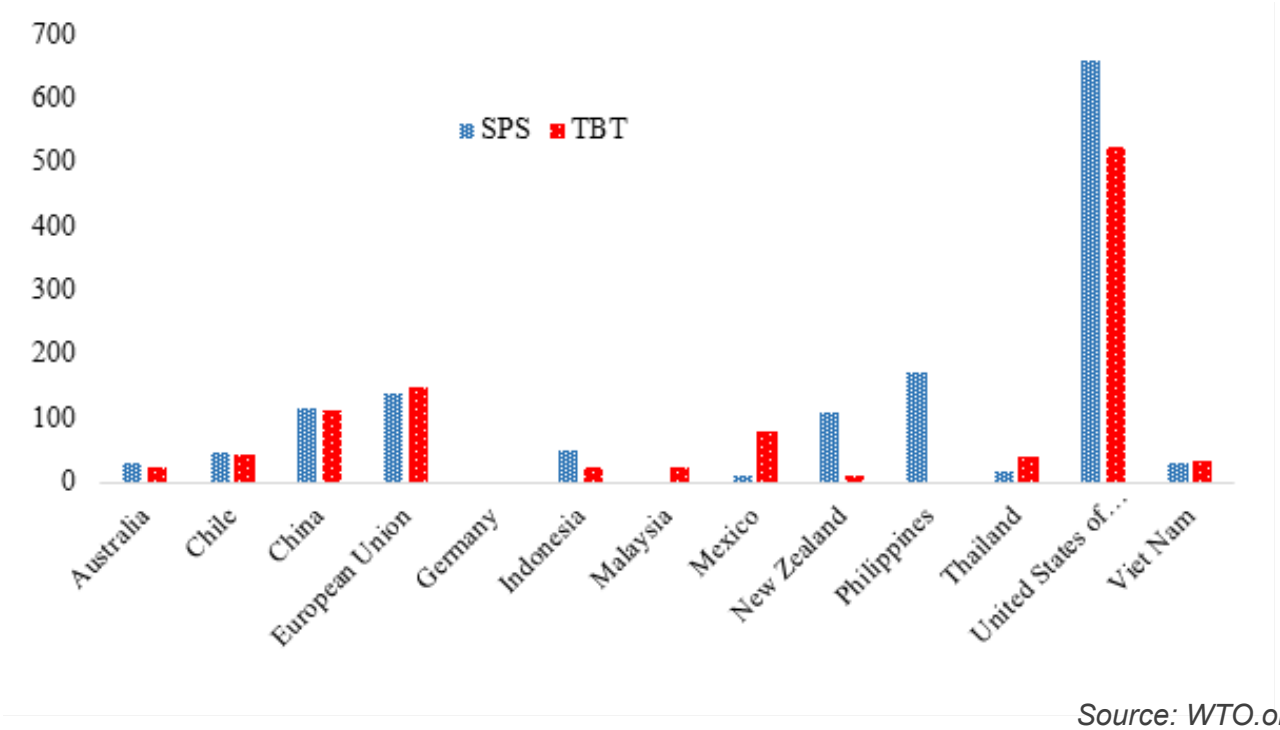
The impacts of climate change on agricultural production have been increasing and unpredictable. According to the 2016 Climate Change Scenario (MONRE, 2017), the temperature in all regions of Viet Nam tends to increase, the annual rainfall also increases but the dry season rainfall in some regions decreases. The number of hot days also tends to increase across the country, the largest number is in the North Central region. Droughts may become more severe in some regions due to rising temperatures and reducing rainfall in the dry season, such as in the Central region and the Mekong River Delta. This will greatly affect the distribution of crops, especially reduce the productivity of crops, greatly impacts on incomes and livelihood of rural people. Saltwater intrusion repeats will effectively reduce the cultivation lands of coastal areas.

Weather changes are becoming complicated, the frequency and intensity of natural disasters are increasing, resulting in more serious impacts on crop production and livelihood. Many extreme weather events have been increasing that affecting on rural infrastructure, threatening the livelihood and health of farmers. Diseases on crops are unpredictable, continue to impact on production and affect consumer's psychology. Pollution and environmental pollution risks, natural resources pollution (soil, water) is rising, creating many risks for agricultural production. Meanwhile, resistance and adaptation to new conditions and risks of rural people are limited and vulnerable.

Traditional markets and new markets raise non-tariff barriers for products imported from Viet Nam when tariff barriers are removed under free-trade commitments.

Currently, to protect domestic production and protect the health of domestic consumers, importing countries use many non-tariff measurements (NTMs). Non-tariff measurements create many economic impacts on trade in goods between countries. In particular, Viet Nam's main markets such as the EU, the US, and China are among the countries that regularly use NTMs, especially in the agricultural sector. These measures include: i) SPS, TBT measures, ii) source of origin, iii) trade remedies (investigation and imposition of anti-dumping duties), iv) requirements related to environmental protection and sustainable development, v) labourrequirements etc. The system of NTMs of different countries is constantly being updated, applied regularly, or irregularly to imported agricultural products.

Figure 20: Number of SPS and TBT measures on imported food during the period of 2015-2020



Source: WTO.org.

Over past years, China was the traditional market of Viet Nam and was considered as an easy market. However, China is no longer an easy market, but a market with high standards on food hygiene and safety, quality, and traceability. In early 2018, China banned 3 Viet Nam rice exporters from exporting to the Chinese market due to phytosanitary violations, bringing the number from 21 Viet Nam enterprises allowed to export rice to China down to 18 enterprises. With fruit sector, Chinese enterprises conducts examination in Viet Nam farmers' plantations to check production infrastructure, processes, and standards (notably litchi and dragon fruit). At the same time, Chinese partners required Viet Nam's enterprises to provide full information on packaging establishments including product name, origin, name, or code of the packer in Chinese or English. In addition, enterprises can add information on barcode, Quick response code (QR code), and anti-counterfeiting stamps. On the other hand, China applies a flexible cross-border trade policy for each group of sectors and each period, so enterprises are always passive.

Accordingly, agricultural production needs to move to a stage of sustainable development and meet high standards, but producers and actors (traders, small enterprises) have not yet been able to access market information fully (needs, standards, trade policies), trade negotiations, timely instructions as well as supporting policies of the Government and related Ministries.

World trade continues to be complicated with the increasing trend of trade protectionism measures. Many countries have switched to applying new forms of trade remedies such as anti-circumvention of trade remedies and origin fraud instead of applying traditional trade remedies. This requires management agencies, sector associations and enterprises to improve their capacity in early warning, analysis, and informing of popular export growth, leading to the risk of being investigated and apply trade remedies and proactively take appropriate measures to protect Viet Nam's agricultural products.

Participating in markets, agricultural products will continue to face many risks and competition pressure. The global financial and economic crises and pandemics have been creating a lot of instability for agricultural exporting countries. The economic downturn has both reduced purchasing power and created a trend of increasing trade protectionism and technical barriers to protect farmers and internal production in developed countries. In addition, there are many risks due to price fluctuations, trade, adverse fluctuations in macroeconomic management, adverse effects of the process of industrialization, urbanization, international integration, etc. It will also create more difficulties in production management, making investment decisions, and threaten farmers' jobs and incomes.

Agricultural products are not only competitive in the world market but also in the domestic market. In the domestic market, there is fierce competition between domestic manufacturers and importers (rice, fresh fruit and vegetable, processed fruit and vegetable) when tariff barriers are eased under international commitments, especially when commitments of CPTPP and EVFTA are implemented. The requirements for food quality and safety are increasingly being raised as incomes are improved. Meanwhile, the quality and safety of imported vegetables and fruits are higher than many domestic products, making priorities in consumer's decision while income is improving.

5. ORIENTATION AND POLICY RECOMMENDATIONS FOR THE CROP DEVELOPMENT TO 2030

5.1. Orientation for crop development to 2030

General orientation for crop development:

- Maintain the role of crop in ensuring food security in all situations and ensuring the fluent operation of the whole supply chains in the crop sector.
- Promote production following to the market-driven orientation and the direction of ensuring food safety, high-quality strictly associated with preservation, processing, and consumption along sustainable value chain on the basis of promoting potentials and advantages of each ecoregion and connect agriculture-industry-service in large production areas.

- Allow flexible land use conversion from food crops to other crops with higher economic efficiency and in line with market needs but can be converted back to food crop production in case of necessity. Accordingly, the irrigation infrastructure system should be built to serve multiple targets.

- Prioritize solutions for post-harvest loss and waste reduction in crop value chains, ensuring sustainability of natural resource use, adapting to climate change, and protecting the environment.

- Focus on quality and added value instead of quantity, improve competitive capacity, combine with taking advantage of opportunities to develop sustainable crop production. Promote the development of high-tech, clean, and organic agriculture.

- Maintain traditional markets stably; continue to expand new and potential markets while focusing on maintaining the domestic market. Accept and prepare for competition in both domestic and international markets.

- Attract foreign investment and domestic private investment in processing and post-harvest technology but associated with social and environmental responsibilities. Do not allow trade-off between environment and investment, pay attention to outdated technology issues.

Development orientation for main crops:

- *Rice:* Maintain rice land use flexibly, reduce area of low-efficiency rice land and convert to other crops with higher efficiency; minimize over-cultivation, gradually reduce area of growing 3 rice crops in a year. Exploit and promote processing products and by-products from rice and paddy rice and improve value-added. Improve yield and quality along rice value chain, proactively produce following market-driven. Maintain the traditional markets, pay attention to the domestic market, and expand new potential markets. Continue to upgrade and protect “Viet Nam rice” brand in the world market.

- *Fruit and vegetable:* Actively focus on building raw material areas according to market standards and requirements. Take advantage and promote domestic demand and prepare conditions for accessing new potential markets. Increase investment in modern technology; apply technological advances in fruit and vegetable processing (Individual Quickly Freezer-IQF, vacuum drying, canning, concentrating, etc.) and preservation. Diversify processed products (juices, fruit powder, confectionery, etc.), increase added-value and increase the proportion of processed vegetables and fruits from 8% at present to 30% in the year 2030.

- *Industrial crops:* Review and make plan for existing production areas, convert inefficient production areas to other crops. Promote sustainable production following certified standards and reduce post-harvest losses. Maintain high positions in the world market, pay attention in branding and trade promotion. Restructure export products towards

increasing processing and improving quality and pay attention in promoting domestic consumption.

5.2. Policy recommendations for the crop sector development

5.2.1. Recommendations for the crop sector

Improve production and post-harvest organization:

- Continue to construct specialized areas that produce the same crop according to certified food safety standards, associating with providing production unit code and origin traceability and ensuring disease-free. Constructing fields and in-field infrastructure in major specialized areas for applying mechanization methods.

- Provide support trainings for enterprises, cooperatives, and farmers to actively produce crops according to sustainable standards and certified standards of importers through agricultural extension activities, programs and projects. Encourage development of enterprises and organizations who provide technology measures of internal supervision and independent supervision for producers to ensure compliance with processes and quality standards.

- Support the development and issuance of planting area codes, support enterprises to apply technology to build traceability systems (block-chain, big data, and internet of things). Support information for domestic exporters to ensure product traceability requirements.

- Promote support policy for private sector researching technological solutions of post-harvest, preliminary processing, preservation, and processing to improve quality, added value, and reduce post-harvest loss.

Manage production resources, protect environmental resources.

- Review and re-evaluate natural production resources (land, water, etc.), strengthen stricter management procedures, and improve usage efficiency. The state agencies associated with private enterprises, private organizations research and develop water storage works, economical irrigation high-tech solutions, and apply measures to recycle use of water.

- MARD continues to review, update, and publicize the list of pesticide active ingredients permitted for use in each foreign market and domestic market. Develop a mechanism to manage and control the supply system of fertilizers, plant protection drugs and seeds in a transparent manner and build strict sanctions for handling violations.

- Prioritize support for developing low-waste and low greenhouse gas emission production models; encourage development of a circular production models for integrated and efficient use of by-products from production.

- Research and exploit beneficial organisms. Promote producing organic fertilizers, biological products, and develop environmental protection cultivation techniques for crop production.

Science and technology

- Prioritize support to attract investment of private sector and FDI in developing processing and preserving technologies and facilities/infrastructure in specialized production areas.
- Prioritizing science and technology funds in research technological solutions and new seed and varieties with high quality and high resistance features to respond to climate change and new diseases proactively and effectively.
- Promote applying digitalization technology in production organization and value chain operation linkage, quality control, process control, increasing connectivity among stakeholders, and value chain management of agricultural products.
- Develop agricultural e-commerce trading platforms using digital technology to link producers and consumers directly.

Research market forecast and information and improve the role of associations:

- Build a specialized and capable department to research, analyze, monitor, update, and publicly and promptly disseminate market information (supply and demand, policies, barriers and market standards, trade policies of partners such as the US, EU, China, Japan) for enterprises and producers.
- Build a market information website and electric commercial platforms to support exporters (information on trade activities of countries, demand for products, importers, changes in policies, market forecasts, specific standards of the market, etc.).
- Linking information between market forecasting analysis with production planning and propagating and providing information to producers about market demands and standards.
- Renovate the role of commodities associations (coffee, rice, fruit, cocoa, sugarcane, etc.) according to a transparent mechanism, unified action to generate sufficient capacity and position to support market information, participate in negotiation, protect enterprises and producers in the export markets. Form specialized departments in Associations or Coordinating Boards capable of consulting on market promotion, brand development and supporting enterprises to penetrate both domestic and foreign markets.

Open and integrate markets:

- Continue to negotiate and open market; diversify the market for crop products. Invest in capacity building for negotiating human resources to support opening export markets and removing barriers in trading.
- Strengthening information exchange and between trade representative agencies of countries to promote the harmonization of standards and mutual recognition of equivalence of plant quarantine, food hygiene and safety system, remove technical trade barriers and handle related problems.

- Review and improve the current system of technical standards and national food safety and hygiene standards for appropriate agricultural products and refer to international standards.
- Research and develop appropriate trade remedies to proactively deal with trade disputes (anti-dumping tax, anti-subsidy tax, countervailing duties) and technical barriers (quality standards, social and environmental requirements). Research and apply support policies for crop sector production and export in accordance with commitments under FTAs to utilize market opportunities.
- Develop communication programs and channels in foreign markets to promote the image and brand of Viet Nam's crop products to foreign consumers.

Improve logistics and processing system to support value chain

- Prioritize support and incentives to attract private and foreign investment (land, credit, tax, etc.) in developing and upgrading of processing factories and centers, warehouses, cold storage facilities for agricultural products.
- Research and develop modern online agricultural trading centers or platforms that directly connect producers with consumers, diversify market access channels and methods.
- Encourage investors to participate in developing wholesale markets, or trading centers in large and specialized production areas.

Training, advocacy, and awareness raising

- Provide trainings for local agricultural officials and farmers on building safe production areas, new knowledge on traceability. MARD supports to grant production unit codes, geographical indications, and respond to disease outbreaks.
- Provide technical trainings for producers on increasing resilience and adaptation ability to climate change.
- Strengthen training, guidance and dissemination of knowledge for farmers, enterprises and central and local officials on general regulations, standards of importing countries, commitments to free trade and its effects on the crop industry.
- Enhance the role of Viet Nam's embassies in other countries (commercial counselors) in updating and providing information, potential import markets and supporting enterprises in market access.

5.2.2. Recommendations for the main crops

For the rice sector:

- Accelerate land accumulation, continue to build large fields, build fields that use synchronous inputs (seeds, fertilizers, pesticides) and apply technical processes uniformly

to produce homogeneous, bulk and safe products to meet market standards.

- Review rice production areas, allow conversion of land use purposes in inefficient or unsuitable production areas. Support credit, technical training and market linkage for farmers in areas of switching to other production activities.
- Continue to develop and protect the national rice brand based on sticking to the standards of the high-end and mid-end market segments to take advantage of potential market opportunities.
- Continue to support the development of commercial sites and e-commerce platforms for connecting producers, traders, enterprises with consumption channels, with direct consumers and reducing intermediaries in the rice chain.
- For exporters: Continue to improve capacity building in technology, management and supervision, proactively ensure food safety and hygiene conditions, satisfy technical standards and control the supply chain to meet the requirements of markets.
- Strictly manage the temporary import and re-export of rice to avoid commercial fraud and origin fraud.

For industrial crop sector:

- Continue to review and classify the existing production areas, assess adaptability and suitability (to climate, land, water sources, irrigation infrastructure, etc.), and economic efficiency of each crop in the ecological regions. In effective production areas, provide supports and incentives to attract private sector to invest and cooperate with producers to promote the application of advanced and high-tech processes from production to preservation and deep processing. For ineffective areas, develop plans to gradually shift to more suitable forms of farming, to plant other crops, or to other more productive areas.
- Promote re-cultivation (coffee) to form stable, safe and sustainable input supply areas for export. Promote state-enterprise-farmer public-private partnership activities in renovating plantations. Focus on supporting farmers in post-harvest stages (collection, preliminary processing and preservation).
- Continue to provide investment incentives to attract enterprises investing in processing and preservation technology and facilities in Viet Nam. Support domestic enterprises in building Viet Nam's product brands, develop domestic consumption channel system. Develop a national brand program for products and develop strategies to promote domestic consumption. At the same time, pay more attention to developing chain stores, developing and protecting product brands abroad.
- Strengthen role and capacity of domestic coordination boards and association in providing consultations on support policies and market demands and standards, supporting for enterprises, cooperatives, and farmers.

For the fruit and vegetable sector:

- Promote cooperation and linkage between stakeholders along value chain, connection with global value chain, in which enterprises play key leading role in operation and governance of the chain to ensure meeting demands and standards of markets.

- Increase investment in research on high-yield and high-quality varieties, research on sustainable farming methods, pest and disease prevention, and harvesting for fruit and vegetable products.

- Prioritize support to apply preservation technologies, develop cold chains system, investin fast and convenient transportation and logistics systems.

- Maintain diversified production institutions such as gardens, farms, households and cooperatives that be suitable to concentration level of production areas.

- Strengthen solutions and distribution channels for connecting farmers and farmer organizations with large domestic and international enterprises directly.

- Continue to strengthen negotiations to open export markets of fruit and vegetable products to high-value markets such as Japan, EU, USA, Korea.

- For processing and exporting enterprises: continue to develop to ensure Good Manufacturing Practice standards and other social standards meet the requirements of importing countries. Actively improve capacity in governance, integration and technological innovation to improve efficiency and respond to market fluctuations.

- Provide support credit for enterprises and production cooperatives in applying mechanization to reduce labor and post-harvest lost rate, encourage application of 4.0 technology in managing large and specialized production areas.

REFERENCES

1. Dak Nong Provincial People's Committee (2019). Report to discuss the current situation of production, processing, consumption and propose solutions to develop pepper in Dak Nong province.
2. Fruit and Vegetable Research Institute (2021). Current status and trend of vegetable production in lazy houses and greenhouses in Viet Nam.
3. General Customs Office (2020). Report on pepper export to the US market.
4. General Customs Office (2020). Report on pepper export to the EU market.
5. Import and Export Department (2017). Report on assessment of domestic and international pepper market trends; solutions to improve added value and competitiveness of Viet Nam's pepper industry.
6. International Pepper Association (2019). Viet Nam Pepper Report-Dak Nong.
7. IPSARD (2020a). Case study: application of digital technology in vegetable industry.
8. IPSARD (2020b). Information on rubber export to the US in August 2020.
9. IPSARD (2020c). Report on developing a project to renew and improve the quality of agricultural vocational training for rural workers in the 2021-2025 period.
10. IPSARD (2020d). Summary of the science and technology development strategy for agriculture and rural development in the period of 2013-2020.
11. Center for Agricultural Policy (2020). Report "Assessment of impacts of COVID-19 pandemic on Agriculture". Research report.
12. MARD (2012). Agricultural restructuring project towards increasing added value and sustainable development.
13. MARD (2020a). National conference on consumption of agricultural products in the context of COVID-19.
14. MARD (2020b). Report summarizing 10 years of implementation Conclusion No. 53-KL/TW dated August 5, 2009 of the Politburo on the Project "National food security to 2020".
15. MARD (2021a). The report summarizing the implementation of the agricultural and rural development plan in 2020 and the implementation of the plan in 2021.
16. MARD (2021b). Conference document summarizing "The implementation of the plan for sector development and agricultural restructuring in the 2016-2020 period".
17. Ministry of Industry and Trade (2019a). Viet Nam logistics report 2019.
18. Ministry of Industry and Trade (2019b). Information on exporting to the EU market coffee industry.
19. Ministry of Industry and Trade (2019c). Information on exporting to the EU market – Fruit

and vegetable industry.

20. Ministry of Industry and Trade (2019d). Information on exporting to the EU market rubber and rubber products.
21. Ministry of Industry and Trade (2020a). Viet Nam logistics report 2020.
22. Ministry of Industry and Trade (2020b). Report on import and export of Viet Nam in 2020.
23. Tran Kim Hao (2021). Assessment on the current situation of main industrial crops in the 2010 – 2020 period. Consulting report.
24. Tran Xuan Dinh (2021). Reviewing the current situation of the rice sector in Viet Nam over the past 10 years, rice orientation in the development strategy of the crop industry. Consulting report.
25. Viet Nam Sustainable Agricuture Transformation Project-VN SAT (2018). Research, review and propose credit policies for coffee growing households.

“This report is a product sponsored by the Project of “Enhancing Agricultural Competitiveness in Viet Nam”.

The report printing is sponsored by the Project of “Enhancing Agricultural Competitiveness in Viet Nam” funded by the Japan Fund for Poverty Reduction through the Asian Development Bank (ADB).

FOR FURTHER DETAILS OF THE REPORT, PLEASE CONTACT:

THE INSTITUTE OF POLICY AND STRATEGY FOR AGRICULTURE AND RURAL DEVELOPMENT

Address: *16 Thuy Khue Street, Tay Ho district, Hanoi, Viet Nam*

Tel: *(84 24)39723390* ***– Fax:*** *(84 24) 39722067*

Email: *tuvanchinhsach@cap.gov.vn* – ***Web:*** *www.ipsard.gov.vn*

Ipsard

INSTITUTE OF POLICY AND STRATEGY
FOR AGRICULTURE AND RURAL DEVELOPMENT

Address: *16 Thuy Khue Street, Tay Ho district, Hanoi, Vietnam*
Tel: *04-39722067*
website: *ipsard.gov.vn*

Japan Fund for Poverty Reduction

From the People of Japan