

## **Policy of Development Food Processing Industry in Vietnam**

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### **Abstract**

Developing the food processing industry not only contributes to increase the added value of Vietnamese agricultural products but also resolves the stable output for farmers. In the value chain of the Vietnamese agriculture, developing the food processing industry is aim to further strengthen the industry-agriculture alliance in the new period. Based on analysis of the secondary data on the food processing industry, the research shows that the Government of Vietnam has many policies to support the development of this industry both in production inputs and market outputs for the processed food products. The food processing industry of Vietnam has achieved many remarkable achievements, but not commensurate with the development potential. Based on that, the article identifies the posed issues and suggests some policy solutions to develop this industry in the coming time.

**Keywords:** Processing Industry; Food; Manufacturing and Processing links; Vietnam.

### **Introduction**

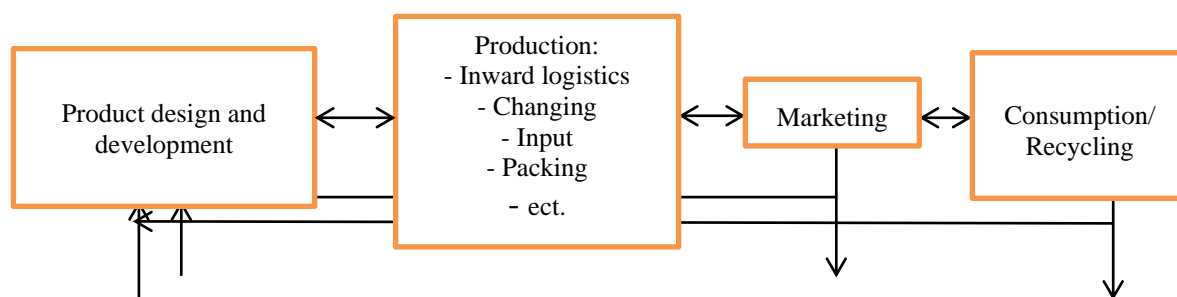
Under the heavy influence of the Covid-19 pandemic, many special agricultural products of Vietnam fell into a state of falling prices, being entangled and needed to call for "rescue" when it could not be exported to traditional markets, especially China (VNA, 2021). However, the chorus of "rescuing agricultural products" has lasted for many years while the vicious cycle of "having good harvest, devaluating" has not been resolved. Vietnam is considered a strong country in the field of agriculture due to its many advantages in producing agricultural commodities that the world needs. Ranked 15th in the world of exporting agricultural products, Vietnam is supplying agricultural products to nearly 190 countries and territories, including many typical products such as coffee, cashew, pepper, tea, rice ... (VNA, 2020). However, in the process of joining the global value chain, Vietnam has just stopped at providing raw agricultural inputs - the stage of creating the least value in the global value chain. Many agricultural products originating from Vietnam occurs the large market share in the international market but do not have their own brands, Vietnamese enterprises cannot participate in regulating the market, Vietnamese agricultural products are currently sold under the brand, labels of foreign importers and distributors, these companies regulate and control the market... (MARD, 2019). The above situation shows that, besides the weaknesses of organizing the production and markets, the process of manufacture, preservation of post-harvest agricultural products in the value chain of Vietnamese agricultural industry has not been developed, and has not contributed much on the added value to this industry.

With the goal to 2030, Vietnam must be ranked in the top 10 countries of the world in processing vegetables, fruits and agroforestry products which is set by the Prime Minister, the processing industry has a growth rate of agricultural product value via processing of 7-8%/year, more than 50% of processing facilities reach the advanced technology level, labour productivity increases 7%/year (VG, 2012) it is necessary to have a completed strategy to develop the processing industry, along with that is the system of policies to support the industry development. Based on the role of food processing industry in the value chain of agricultural products, the development status of Vietnamese food industry in recent years and current policies, this research identifies a number of issues with the policies for developing the food processing industry in Vietnam.

## Literature review

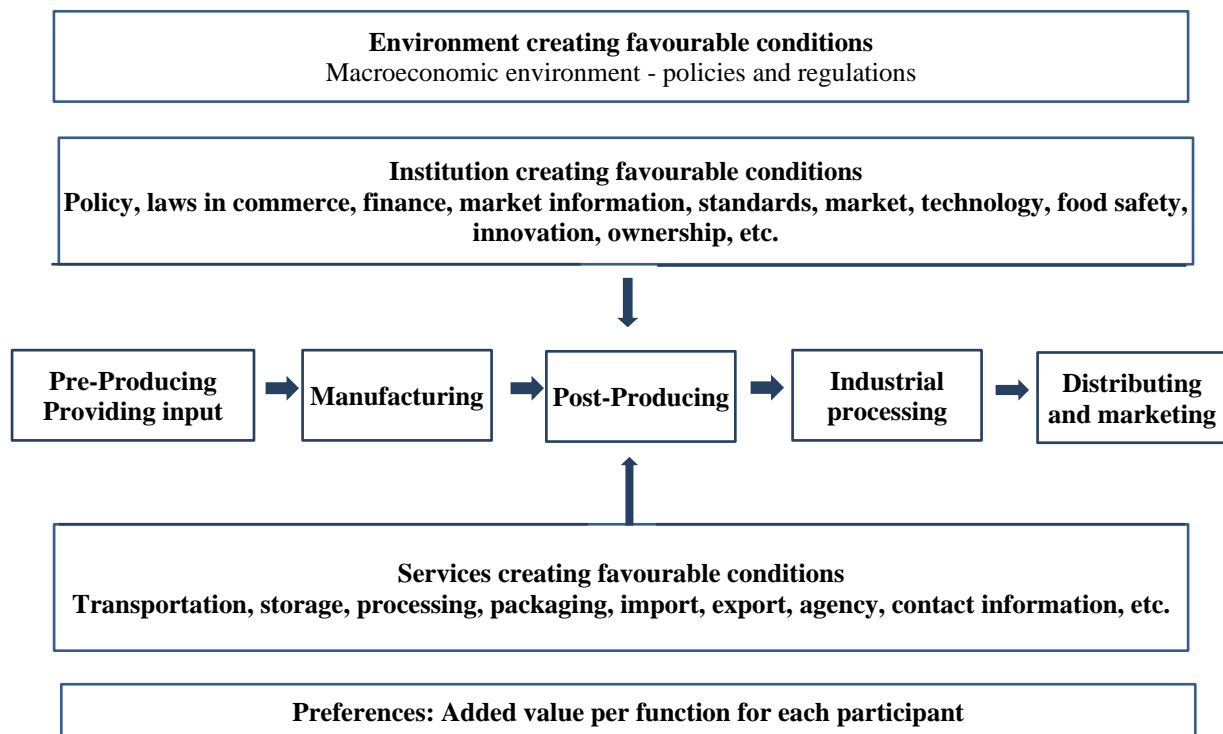
### *Concept of agricultural value chain*

Value chain is a concept that can be simply described as the whole series of necessary activities in order to change a product (or a service) from an idea, through different stages of production, until the distribution to the final consumer and discarded after using (Kaplinsky and Morris, 2001). Manufacturing processes require a combination of the physical transformation and the participation of different manufacturers and services, and a chain of handling the product after use, which is generally described on the four links of a simple value chain in Fig 1. The concept of value chain emphasizes the importance of added value at each stage, manufacturing is only one of the added value elements in the chain (UNIDO, 2009). Building the value chain is a complex, highly coordinated process through many stages with many stakeholders. A value chain exists when all participants in the chain work in order to create the maximum value in the whole chain.



**Figure 1.** *Four links in the simple value chain (Kaplinsky and Morris, 2001)*

More broadly, the concept of value chain encompasses the issues of organizing and coordinating, strategies and power relationships of the various factors in the chain. The conditions of macro economy, policies, laws, regulations, standards and institutions, factors such as research and innovation, human resource development and other support services create the environment in which these activities take place, and these are also the important elements and activities in the value chain (Figure 2). In the broad sense of the value chain, in order to successfully develop the value chain, besides the leading role of the factors in the chain in the implementation of development tasks, the supporters will play a supporting role, creating good markets for factors in the development process.



**Figure 2.** *General value chain (UNIDO, 2009)*

The value chain is extremely important in agricultural production. The value chain in agriculture identifies a system of factors and activities to bring a basic agricultural product from production to final consumption, at each stage the product is added one specific value. A value chain can be a vertical link or a network of various independent business organizations and may involve to processing, packaging, preserving, transportation and distributing (FAO, 2010). Traditional agricultural value chains are often regulated through market transactions involving a large number of small retailers and producers. The modern agricultural value chain is characterized by vertical coordination, strengthening the agro-industrial supplying and processing facilities and using the standards throughout the chain (FAO, 2010). The agri-food value chain is designed to increase the competitive advantage through the cooperation in joint-ventures of manufacturing, processing, marketing, food service companies, retailers and other support groups such as shop owners, research groups and suppliers.

### ***Food processing industry***

The characteristic of agricultural production is distinct regional and highly seasonal. This characteristic came from the cause of agricultural production influenced by many factors of natural conditions, economy, society, environment... but these characteristics are different in each region; each plant or animal is suitable for a certain living condition. As a result, the supply of agricultural products is not continuous and unstable, and there is a certain lag compared to the demand of the market, resulting in unstable prices. The dependence on natural conditions has made agriculture being limited and strongly "regionalized". Meanwhile, the demand for agricultural products is constantly and often available. The seasonal and regional characteristic of agricultural products have led to an imbalance between supply and demand, which requires the phase of forecasting demands being enhanced to meet the constant demand of the market. In addition, agricultural products are mostly fresh, alive, perishable, quickly degrading after harvest, short storage time, many products such as vegetables, aquatic product foods, meats finding difficulties when transporting to a long distance, requiring processing and preserving before transportation, meanwhile the consumption market of agricultural products

often locates far away from the manufacture places. This requires the preserving technology after harvesting and manufacturing to be considered for development investment in order to extend the life cycle of agricultural products.

The global population is estimated to increase to 9.7 billion by 2050 (UN, 2015), this along with the income increase in developing countries (creating a trend of changing diets with many proteins and meats) are driving the global food demand. It is estimated that by 2050, food demand is expected to increase between 59% and 98% (Valin, Hugo, et al, 2014). Moreover, today, the role of women in the society is increasing, they are always busy with work, therefore the time spending on shopping and food processing is increasingly shortened. Therefore, the demand for preliminary, easy-to-cook or ready-to-cook foods is increasing, opening up a lot of potential for the food processing industry.

In Vietnam, the food processing industry is identified as a key industry with the advantages of a rich and diverse local raw material source, a large consumer market (both domestic and export). Food processing industry plays an important role in promoting exports, creating jobs, increasing incomes for workers and developing socio-economy, and most importantly, is a decisive factor in the sustainable development of the country's agricultural sector, which is affirmed in Vietnamese agricultural development policies. Resolution 26 on Agriculture, Farmers, and Rural Areas also specifies that restructuring of the agricultural sector must link to the manufacturing process and markets. Encouraging the economic sectors to invest in the development of fine and deep processing industries in association with raw material areas and markets; promoting handicraft production, implementing conservation and development program villages. In the master plan of agricultural production development to 2020 and in the vision to 2030, it is indicated that agricultural development must closely connect the production with the industry of preservation, processing and consumption markets; accumulating land, forming concentrated commodity production areas. The project of restructuring the agriculture towards higher added value and sustainable development also clearly indicates the need to link the production with the processing and consumption of agricultural products. And as affirmed by the Prime Minister Nguyen Xuan Phuc at the Conference "Promoting the development of agricultural products processing industry and agricultural mechanization" on February 21, 2020 that "Without processing, it is difficult for agricultural products to increase value, not solving seasonal problems".

### ***Develop food processing industry***

In the history of the revolutionary struggle of the proletariat, the industrial-agricultural coalition played an important role not only in gaining power but also in keeping the government. The content of the industrial-agricultural alliance does not stop at the political union, C. Marx and F. Engels also clearly indicated the economic alliance between these two classes. In the stage of socialist construction, the economic alliance is the basic, regular and permanent alliance, which is the basis for the alliance in other fields.

The Marxist-Leninist theory of class alliances has been properly and creatively applied by the Communist Party of Vietnam, expanding into an alliance between the working class and the peasantry and the intellectuals. The XII Congress of the Party affirmed: "Strengthening the national solidarity on the basis of the alliance of the working class with the peasantry and intellectuals led by the Party, so that this force can truly become the foundation of the national solidarity (Central Party Office, 2016). The process of industrialization of the country continues to confirm the role of the industrial-agricultural alliance, in which the harmony of the alliance in economy determines the solidity of the class alliance and the success of the country industrialization. Economically, the nature of the industrial-agricultural alliance is the

process of properly addressing the relationship between the economic interests of two classes and the whole society. These economic benefits are not antagonistic but are basically united but there are always contradictions that needed to be detected and addressed with specific conditions. The process of properly combining the economic benefits manifests in the interactions between the industry and the agriculture, workers and farmers (Pham Van Bich, 2015).

The relationship between the industry and the agriculture in the alliance process is the most basic relationship in our country's economic development. Industry and agriculture are the two legs of the economy, "industry and agriculture must help each other and develop together, like the two legs which go strong and go steadily will go forward quickly and quickly reach the goal. Therefore, implementing the industrial- agricultural alliance is building the socialism, building a life full of happiness for the people "(Ho Chi Minh whole episode - Episode 13). This has been affirmed and further developed by the Party in the Platform for building the country during the transition to socialism (Approved at the Seventh National Congress of the Party), thereby creating conditions for the working class and the peasantry to unite together in order to develop the production force and industrialize the country towards the modernization in association with the development of a comprehensive agriculture, aiming to gradually build up the material-technical foundations of socialism, constantly improving social labour productivity and improving people's lives. It can be affirmed that agriculture cannot have high productivity, high output and good quality without the direct impact of industry; and industry cannot develop steadily and become more modern, it is impossible to industrialize the country without a comprehensive agricultural development as a basis. The connection between industry and agriculture, workers and farmers, urban and rural areas in the country's economic development direction is reflected in the process of linking industrial and agricultural production, and in the process of circulation, exchange, goods exchange, distribution and products consumption. At the same time, it is also the process of combining economic benefits in the right way, creating the most basic motivation for workers and farmers to feel secure, excited to promote the production in a closed and long-term cooperation. In terms of production process, agriculture cannot develop sustainably without the development of the processing industry

President Ho Chi Minh asserted: "only when the working class leads, the peasants can be liberated. Only tightening the alliance with peasants, the working class can lead the revolution to victory". This is becoming more and more true in the current process of industrialization and economic development. Industry, especially the processing industry plays a leading role in the development of sustainable agricultural production, and the processing industry must be closely linked to agricultural production so that the industrialization of agriculture can be successful.

## **Methodology**

The author has used the research methodology of Max-Leninism to supplement and complete the theoretical basis for the development of the processing industry, the policy for the development of the food processing industry. Besides, the author also uses the bibliographic method, so that, from the current leading foreign and domestic researchers, have received updated information on the current situation of industry development policy. food processing industry and possible development directions that can be applied to Vietnam. An empirical-theoretical method is also used, which is necessary for the proper disclosure of terms important to the topic of this article. The use of historical and legal methods is due to the analysis of the

emergence and policy development of the food processing industry in Vietnam and around the world, as well as the factual study of the conditions of the food processing industry. historical facts and requirements relevant to the development of the food industry in Vietnam. A comparative approach is used to conduct a qualitative comparative analysis of the extent of food industry development policy implementation in Vietnam and other specific regions around the world, a systematic approach to help identify Identifying issues of food industry development and forecasting methods allows to draw conclusions about prospects for improving regulatory mechanisms to ensure environmental safety in the context of industrialization-modernization of the country. Vietnam and international economic integration.

## **Research results**

### ***Policy system for developing the food processing industry in Vietnam***

The manufacturing includes activities that change the physical and chemical aspects of raw materials or parts to create new products. Raw materials for manufacturing are from agriculture, forestry, fishing, mining and quarrying, as well as other products of processing. Changes, renovations, or restorations of goods are also considered manufacturing activities. The output of manufacturing can be a finished product for final consumption or a semi-finished product for input of further processing (VG, 2018).

System of Vietnam economic sector currently divides the manufacturing (Level 1 - Section C) into 24 divisions (Level 2), each of which is assigned a two-digit code according to the corresponding section, including manufacture of food products (division C10). This is the industry using the main source of raw materials which are agricultural products, including 8 groups (Level 3, from C101 to C108): Processing and preserving of meat and meat products; Processing and preserving of fisheries and fishery products; Processing and preserving of fruit and vegetables; Manufacture of vegetable and animal oils and fats; Manufacture of dairy products; Milling and manufacture of flour; Manufacture of other food products; Manufacture of feeds for cattle, poultry and aquatic animals (VG, 2018).

With the close link between the food processing industry and the agriculture as the above analysis, the development policies of food processing industry are not only in the “Industry” but also in “Agriculture” and the link between these two sectors. Recognizing the important role of the food processing industry for agricultural production in particular and for the socio-economic development in general, the Government of Vietnam has paid great attention to improving the investment environment, issuing policies, organizing a variety of programs, activities to support, promote trade and investment for domestic and foreign enterprises in order to support internal capacity renovation, enhance competitiveness in domestic and international markets.

### ***Policies to support inputs and production***

In order to create a stable raw material area for processing, many policies to encourage enterprises to invest in agriculture, encourage cooperative development, and production connection have been issued. Typically, Decision 80/2002/QD-TTg encourages the consumption of agricultural products through contracts, Decision 62/2013/QD-TTg on October 25, 2013 to encourage the development of cooperation and joint production with the consumption of agricultural products, the construction of the large fields, in which specifies the incentive and supportive policies for farmers, businesses and representative organizations of farmers in order to encourage production connection with the processing and consumption

of agricultural products under the large field construction projects. The forms of cooperation and connection stipulating in this Decision include: The cooperative association between farmers, representative organizations of farmers and enterprises is carried out by the contracts providing input services attaching to the production, consumption and processing of agricultural products belonging to large field projects which are already approved by competent authorities. Decree 98/2018/ND-CP on policies encourages the development of cooperation and association in the production and consumption of agricultural products. The supportive policies to reduce agricultural losses have also been issued (Decision 68/2013/QD-TTg dated 14/11/2013); in which stipulates that enterprises being eligible for assistance must sign the association contracts to implement the production, consumption of agricultural products, mechanized services with cooperative groups, cooperatives or farmers.

The Government has also issued policies to encourage businesses to invest in agriculture and rural areas (Decree No. 210/2013/ND-CP dated December 19, 2013); in which stipulates that investors when constructing raw material areas with association contracts on stable production of raw materials with the local people are given priority in consideration of preferences, investment support. Policies to encourage enterprises to invest in agriculture and rural areas include: supporting for training of human resource, market development and application of science and technology; supporting investment in slaughter of cattle and poultry; support investment in cattle facilities; supporting planting medicinal plants and macadamia trees; supporting investment in aquaculture in the sea; supporting investment in facilities of drying rice, maize, potato, cassava, aquatic by-products, coffee processing; supporting investment in processing particular wood plantations in the North-western provinces and in the provinces with poor districts.

By 2018, in order to continue improving the incentive mechanisms and policies, creating a favourable environment for business investment in general and agriculture and rural areas in particular, the Government has issued Decree No. 57/2018/ND-CP on mechanisms and policies to encourage enterprises to invest in agriculture and rural areas, including supporting infrastructure, taxes, renting premises to produce and build factories. At the same time, the Decree aims to develop businesses to lead the agricultural restructuring towards modernization, adaptation to climate changes, increasing the added value and competitiveness of the agricultural sector. Continuing to strongly reform the administrative procedures in national management related to people and businesses, creating favourable conditions for businesses to increase access to the national resources and supportive capital. In addition, reducing the supportive conditions to expand the supportive target, creating opportunities to reduce the market entry costs, promoting the start-up wave in agriculture and rural areas. The Decree has many new key points to attract in maximum of businesses to invest in agriculture and rural areas such as: enterprises implement projects on the basis of state supportive norms and achieving the post-investment support, the simplification of administrative procedures, the support of land concentration, investment credit, scientific and technological application, agro-forestry and aquatic product processing, agricultural and rural infrastructure in order to socialize the public services... Regarding the administrative procedure reform, the procedures that have been reduced include 03 construction procedures (construction permit, planning license, design evaluation license), and 01 decision-making procedure of investment policy, reducing 01 procedures of technology appraisal; Enterprises investing in rural areas without urban planning only need to make 1/500 master plan and submit it to the provincial level for approval. Deciding the policy according to the list of projects, businesses will reduce many difficulties when advocating each project. When there is a list of provincial project guidelines issued annually. Enterprises are allowed to actively

invest. The remaining procedures such as land, environment, fire prevention, etc. are allowed to integrate the procedures, constructing while completing the procedures. When having the investment policy, enterprises can immediately execute its construction without waiting for procedures of Construction permits, Change of land using purpose, Report on environmental impact assessment. These procedures are completed simultaneously before the factory goes into operation.

The results of these policies are expressed in encouraging numbers. According to the results of the 2016 agriculture, forestry and fishery census, the whole country has 2,262 models of large field linkages, however, the percentage of large field areas signed on the underwriting contract by the enterprises has differences between types of crops, specifically, 93% of sugar cane area, 67.8% of maize area, 53.3% of bud tea area, 26.5% of rice area and 10.8% of vegetables area which are planned for producing on large fields are signed on the underwriting contracts by enterprises. According to enterprise data from the Ministry of Planning and Investment, by 2018, the number of agricultural, forestry and fishery enterprises was 9,235, increasing 2,200 enterprises compared to 2017 and increasing 3.6 times of the enterprise number in this field in 2010. In 2016, there were 781 enterprises (accounting for 20.3%) implementing the linkage in agricultural production and processing. By 2018, the whole country had 1,096 link chains, increasing 350 chains compared to 2017. This result shows that the policies to strengthen the connection between the production and processing and the consumption of agricultural products initially brought efficiency, attracting more businesses to invest in agriculture and processing agricultural products.

In addition, many preferential policies on credit are also issued to support the development of agricultural businesses, such as: Decree 55/2015/ND-CP on credit policies for development agriculture and rural areas, which was amended and supplemented by Decree 116/2018/ND-CP; Decree 67/2014/ND-CP on fisheries development policies which was amended by Decree 17/2018/ND-CP; Decision No.1050/QD-NHNN dated May 28, 2014 of the State Bank on pilot lending program for associated models in the chain of production and consumption of agricultural products, models applying science and hi-technology in agricultural production according to the Government's Resolution No.14/NQ-CP dated March 5, 2014; Decision No.813/2017/QD-NHNN dated April 24, 2017 on the lending program to encourage development of hi-technology and clean agriculture in order to implement the Resolution 30/ND-CP of March 7, 2017 of the Government.

Although many preferential policies on credit have been issued, the results have not been satisfactory. Typically, in 2018, only about VND 8,000 billion were disbursed for loans under the Decision No.1050/QD-NHNN, occurring for only 1.2% of the total outstanding loans of agriculture, forestry and fishery. This shows that the current credit incentive policy is not really effective. According to the results of the 2016 Agricultural Enterprise Survey of the Institute of Policy and Strategy for Agriculture and Rural Development, the current credit incentive policies for promoting the development of agricultural enterprises are approached with the supportive interest rates in cumbersome procedures; the regulations indicate that subjects and areas having access to credit are difficult areas, while most agricultural enterprises are based in cities and delta areas; the loan procedures and conditions are complicated, which reduce the bank's risk; credit forms and tools are still limited; the land mortgage with properties has many problems and limitations while there are no regulations on considering mobile assets such as machines, equipment, storage receipts (certificates of stored agricultural products) as collateral loans to borrow.



### ***Policies supporting the output of processed food products***

Recently, supporting the trade promotion for domestic enterprises in general and food enterprises in particular, the Government has approved the National Trade Promotion Program, Vietnam National Brand Program, Vietnam food Branding Program, the program 'Supporting businesses to improve their design and product development capabilities'... and assigning the Ministry of Industry and Trade to preside over implementation. Annually, many events such as fairs, exhibitions, conferences, working groups of ministries, sectors... have been organized to promote products and brands, opening many domestic and foreign trade opportunities for domestic food businesses.

In addition, conferences and seminars with the participation of leaders of relevant management agencies under the Ministry of Industry and Trade, Ministry of Planning and Investment, Ministry of Agriculture and Rural Development, representatives of foreign organizations, typical Vietnamese businesses in the field of processed food sector, foreign experts are periodically organized, in order to provide a panoramic view and convey the most important and up-to-date information on Vietnam food processing industry. At these conferences, a number of issues in the food processing industry are being paid attention by many investors, such as potential raw material areas and consumption markets, an increasing trend of convenient processed products and investment trends in applying new technologies, raising added value... They have the opportunity to discuss with the national management agencies, thereby contributing to solve the current difficulties of the domestic and foreign investors; at the same time offering solutions to enable the development of the domestic food processing industry in the future.

### ***Situation of developing the food processing industry in Vietnam***

In recent years, with the Government's attention through supporting development policies, the agricultural product processing industry has made a strong development in terms of scale and modernity. In the period of 2012 - 2020, the index of industrial production of food processing industry reached the average of 6.81%/year. The agricultural processing industry has also formed and developed an industrial system of agricultural processing and preservation with a designed capacity of up to 48.7 million tons and 304.4 million litres of final products in 2020 with 8,484.7 million USD of total investment (MOIT, 2020). In 2020, there are 9,490 enterprises operating in the field of food processing industry, with a total capital of 39.59 billion USD and creating jobs for more than 536 thousand employees (GSO, 2021). Besides, there are still tens of thousands of individual business establishments and households working on preliminary processing and processing to serve the domestic consumption. The agricultural product processing enterprises in Vietnam are mostly small and micro enterprises with low and medium technology level in raw processing, therefore the value-added of processed agricultural products is low. Some of the main processing industrial products in the food sector are shown in Table 1, of which the lead is still milled rice with over 43 million tons, followed by the animal, poultry and aquatic feed. The processed aquatic products in frozen form occurred the large part, the canned seafood had modest production output, reaching only 110 tons in 2018.

**Table 1:** *Production of some food processing industrial products*

Products	Unit	Production					Growth rate (%)		
		2010	2015	2018	2019	2020	2011-2015	2016-2020	2011-2020
Milled rice	Thous . Tons	33,473.0	40,770.0	41,460.5	42,658.6	43,530.1	4.02	1.32	2.66
Animal and poultry feed	Thous . Tons	8,708.8	13,272.0	16,456.8	17,687.7	18,044.5	8.79	6.34	7.56
Aquatic feed	Thous . Tons	2,096.0	3,873.9	5,081.3	5,613.2	5,628.4	13.07	7.76	10.38
Frozen aquatic products	Thous . Tons	1,278.3	1,666.0	2,083.9	2,158.4	2,194.1	5.44	5.66	5.55
Refined sugar	Thous . Tons	1,141.5	1,842.1	1,902.6	1,853.6	1,711.0	10.04	-1.47	4.13
Refined vegetable oil	Thous . Tons	565.9	966.1	1,168.8	1,253.1	1,315.3	11.29	6.37	8.80
Fresh milk	Mill. litres	520.6	1,027.9	1,217.9	1,323.4	1,296.8	14.57	4.76	9.56
Fish sauce	Mill. litres	257.1	339.5	374.8	378.8	375.4	5.72	2.03	3.86
Sodium glutamate	Thous . Tons	248.2	263.3	305.2	327.3	346.2	1.19	5.63	3.38
Powder milk	Thous . Tons	58.9	99.3	121.3	119.1	129.2	11.01	5.41	8.17
Powder and instant coffee	Thous . Tons	68.1	87.6	107.4	124.7	134.5	5.17	8.95	7.04
Tea	Thous . Tons	211.0	167.8	169.3	169.6	154.2	-4.48	-1.68	-3.09
Canned meat	Thous . Tons	48.4	65.1	79.1	N/A	N/A	6.10	N/A	N/A
Canned fruits and nuts	Thous . Tons	60.1	49.2	56.9	N/A	N/A	-3.92	N/A	N/A
Canned vegetables	Thous . Tons	4.7	4.4	3.9	N/A	N/A	-1.29	N/A	N/A
Canned aquatic products	Thous . Tons	0.1	0.1	0.1	N/A	N/A	5.52	N/A	N/A

(Source: *General Statistics Office of Vietnam*)

Among the major export items of Vietnam (Table 2), apart from traditional agricultural products, which still maintain an annual export turnover of over \$1 billion, some processed

food items have gradually appeared in the list with the modest export value but also contributed to increase the export turnover of the country, as well as to show the development of the processing industry over the past time, such as starch & cereal foods, milk and dairy products, frozen and processed meat. Notably, processed fruits and vegetables have increased in output, and the industry's breakthrough in the export turnover over the past years brought it into the group of industries with export turnover of over 3 billion USD in Vietnam. It is considered a key industry in restructuring farming in Vietnam. In this sector, dragon fruit is an emerging fruit in export in recent years besides guava, litchi. Dragon fruits are planted in 30/63 provinces and cities, the export value of dragon fruits reached 1.1 billion USD in 2018, occurring 28.9% of the total export turnover of fruits and vegetables of the country.

**Table 2:** *Export turnover of some agricultural products Unit Millions USD*

<b>Product</b>	<b>2010</b>	<b>2015</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Fishery products	5,016.90	6,568.80	8,771.00	8,514.00	8,389.00	8,882.00
Fresh, processed vegetables and fruit	460.3	1,839.30	3,814.60	3,704.10	3,271.60	3,546.80
Cashew nut	1,136.90	2,397.60	3,368.20	3,335.90	3,213.90	3,636.70
Coffee	1,851.40	2,671.00	3,536.40	2,863.80	2,742.00	3,072.60
Tea	200.5	217.2	227.2	242.2	219.3	213.8
Pepper	421.5	1,259.90	759	714.4	660.6	937.8
Rice	3,249.50	2,796.30	3,060.20	2,806.40	3,120.00	3,287.50
Cassava	567.2	1,320.30	961.3	970.3	1,017.90	1,175.20

(Source: General Statistics Office of Vietnam)

Processing and preserving meat and meat products: The percentage of processed meat in our country is generally low, from 2000 to the present, the processed meat output occurred 20-25% of total meat output. Most meat products are consumed domestically (General Department of Livestock Production, 2020). Currently, Viet Nam has about 63 meat processing factories with the output of processed meat products reaching about 1.1 million tons, accounting for 19-20% of the total meat domestic production (Tam An, 2020). Particularly in the period 2017-2020, businesses have invested 9,221 billion VND to build and inaugurate 9 slaughterhouses and meat processing plants with a designed capacity of 725,000 tons of processed meat per year. These are factories with regional and world-class advanced technology. Meanwhile, previously invested factories had equipment renewal coefficient of only 7%/year (equivalent to 1/2 and 1/3 of other countries). Some industrial processing facilities are over 15 years old with equipment and technology are outdated, therefore energy consuming is high but productivity is low. Besides, the individual business establishments and households process traditional dishes such as pork-pie, sausage, Chinese sausage, jambon... have manual technological capacity, and mainly use semi-mechanized tools such as grinding, pressing... In general, the technological level of the meat processing industry in our country is now backward.

Processing and preserving aquatic products and products from aquatic products: In Vietnam, the fishery sector plays an important role in the national economy, accounting for about 4-5 percent of Gross Domestic Product (GDP) and about 9-10% of national export revenue (fishery export turnover in 2020 reaches 8.4 billion USD) (VASEP, 2020). More than 4 million of people working in the fishery and the growth in production have attributed to the fish exports. Thanks to strongly increase in many years, Vietnam ranks among the top ten seafood suppliers and its seafood products are exported to 170 markets in the world. Shrimp,

pangasius, tuna, squid and octopus are main seafood products exported by the country. In which, shrimp exports create about 3.5-4 billion USD, make up 46-50% of the total seafood sales of Vietnam. Earnings from pangasius reached at 1.7-1.8 billion USD (25% of the total) and exports from Tuna and Cephalopods are 450-550 million USD for each.

There are 636 industrial processing facilities associated with exports and over 3,000 small processing facilities associated with domestic consumption. The cold storage capacity is about 600 thousand tons. The total processing capacity is about 2.5 million tons of products per year; the rate of using the overall design capacity is 65%. Product structure: Frozen products: 80%; Dry products: 7%; Products of fish sauce: 5%; Other products: 8%; the percentage of added value products averages over 30% depending on the type of fishery products.

Processing and preserving fruits and vegetables: the demand in the domestic and export markets for processed fruits and vegetables is increasing day by day. Therefore, in the past few years, the number of fruit and vegetable processing establishments has increased, and the processing technology has been gradually improved significantly. Popular processed fruit and vegetable products in Vietnam are dried fruits, fruit juices and canned vegetable juices. According to Center for WTO and International Trade - VCCI and The Hanoi Center of Investment, Trade and Tourism Promotion (2020), in 2019, Vietnam has about 157 large-scale fruit and vegetable processing establishments, with processing technology reaching the world average, with a processing capacity of about 1.1 million tons of products per year. However, most of these enterprises can only take advantage of about 50-60% of capacity due to instability in output (such as a decrease in market demand) or input (such as a lack of centralized raw materials). In addition, Vietnam has thousands of small fruit and vegetable processing factories, with limited technology and undiversified products, mainly serving the domestic market, which have not met the requirements, standards and appeal to other markets. foreign.

Vietnam's fruit and vegetable exports have increased continuously in recent years (see table 2). The average growth rate of Vietnam's fruit and vegetable exports in the 2011-2019 period was 26,1% with mainly due to the growth of the fruit group (fresh and semi-processed) and the group of processed fruits and vegetables. Vegetables and fruits are one of the export groups that are heavily affected by COVID-19 shown by export value dropped significantly in 2020 and 2021.

Processed vegetables and fruits for export of Vietnam are increasingly diversified in types, from fruit and vegetable juices (apple, orange, pineapple, coconut, tomato...), canned vegetables (corn, peas...), dried vegetables (potatoes, jackfruit, bananas,), jelly jams.

Production of vegetable and animal fats and oils: The Vietnamese vegetable oil industry currently uses both which are domestically produced crude oil (mainly from sesame, peanuts and rice bran) and imported crude and refined oils (mainly palm and soya oil) for the manufacturing process. The products of this industry are divided into 4 groups: cooking oil, salad oil, nutritional oil and solid oil. Currently, cooking oil enterprises only supply 30% of the domestic market demand. Despite the large market potential, the cooking oil industry is currently facing difficulties that are not easy to solve immediately, including: heavily dependent on imported raw materials and the competitiveness of domestic enterprises with foreign businesses is still poor.

Manufacture of dairy products: Vietnam is emerging as one of the countries with dynamic dairy production and processing industry, especially in recent years. Like many other

dairy producing and processing countries, Vietnam's dairy industry is also in a shortage of supply to serve the domestic market and export. According to Research and Market (2022), there are more than 200 dairy producers in Vietnam by the end of 2021. The dairy market in Vietnam is mainly dominated by major players such as Vinamilk, Nestle Vietnam, Nutifood, Frieslandcampina and TH Group, the rest are mainly small and businesses. Vietnam's fresh milk production reached 1.2 billion liters in 2021 and can only meet 40-50% of domestic demand, with the rest relying mainly on imports. Besides, the demand for cheese and butter is rising rapidly due to the growing influence of Western food in Vietnam, especially among the younger generation in urban areas.

Enterprises involved in milk production and processing in Vietnam include foreign-invested and domestic enterprises. The competition between domestic milk production and processing enterprises with imported milk brands has made Vietnam's dairy industry face great challenges but also has many opportunities to develop and dominate the market.

Milling and producing flour: the whole country currently has 580 industrial-scale milling facilities with a capacity of 10 million tons per year and a total storage capacity of rice storage of 7 million tons. Regarding processing technology equipment, large-scale rice processing enterprises and facilities have basically been mechanized, many of which reach average advanced level compared to other countries in the region. However, in-depth processing and diversification of types of rice and processed products from rice have not been developed, by-products from rice (rice husks, bran, straw ...) have not been processed to raise the added value, increasing the production efficiency

Production of other food products (sugar, tea, coffee ...): Vietnam is the 7th largest tea producing country, the fifth largest tea export volume in the world, with 124,000ha of tea planting and more than 500 production and processing facilities; capacity of over 500,000 tons of dry tea per year. Although tea is the strength of Vietnam, the preservation and processing are backward. In the processing stage, finding ways to eliminate tannin - a typical substance in tea but not good for health - is not implemented by businesses, farmers have not enough capacity and the state has not paid attention. Therefore, Vietnam mainly exports only tea in its raw form and raw materials at prices equal to 60-70% of the world price (Nguyen Hanh, 2018).

Vietnam's sugar industry is still in its infancy and is at an early stage of development (Ngo Thi Thanh Tam, 2017). Among the agricultural crops cultivated in Vietnam, sugar cane is the crop with the most cohesion between farmers and processing enterprises through the contracts of investment and product consumption. Currently, there are 41 sugar factories nationwide distributed from north to south. The production scale is quite small, sugar area and output respectively occurs 1.16% and 0.85% of global. The consumption of sugar-cane in our country's sugar production process is still very high, up to 14 tons of sugar-cane to produce 1 ton of sugar, while in other countries this rate is much lower, it is only about 8-9 tons of sugarcane for 1 ton of sugar in Thailand and Brazil.

Vietnamese pepper is processed into three main product categories: Black pepper (occurring 80-85%), white pepper (15-20%) and red pepper (newly processed on a small scale). Vietnam currently has about 200 pepper processing and trading enterprises, including 15 leading enterprises, occurring 70% of the country's export. Especially, there are 5 foreign invested enterprises, occurring nearly 30% of export market share. Pepper products are mainly exported, occurring 95%, domestic consumption occurs 5%. Vietnam's pepper processing technology has approached the standards of the world market in general. Enterprises with high-tech processing plants following the ASTA, ESA and JSSA standards have created a variety of

products: whole black pepper, white pepper, powdered pepper, and small packages. But overall, Vietnam's pepper is still mainly exported under raw materials, value lower than the prices of India, Malaysia.

Vietnam has become the largest cashew exporter in the world and the kernel has been in the list of major agricultural export products of our country. However, the domestic cashew processing industry is facing many inadequacies and difficulties in raw materials, most of raw materials for processing must be imported so the profit of the industry is not high. This poses an urgent problem to complete the planning of centralized material areas, linking production along the value chain from farmers to businesses.

Coffee in Vietnam is processed mainly in 3 areas: small-scale and handicraft households; coffee kernel processing plants; powder coffee processing plants. Selective harvesting, which selects ripe coffee fruit and leaves unripe ones, is uncommon in Vietnam, most coffee-growing areas are often harvested by stripping both ripe and unripe coffee fruit. It leads to the uneven material quality. The most common processing technique in our country is still the natural post-harvest drying method. In this method, coffee is dried under sunlight or in a mechanical dryer. Currently, nearly 80% of post-harvest processing is made by sunlight. However, coffee farmers, producers and traders in the Central Highlands region are increasingly using machines to dry coffee fruit, with the main raw material using for the dry machine is the coffee pods. Meanwhile, the large-scale coffee producers mainly use wet processing technology. This is the current common processing technology and is applied in many other countries around the world. Currently, there are hundreds of factories across the country with wet or dry processing technology, mainly located in the Central Highlands and Southeast regions. The design capacity is about 1.5 million tons a year - enough to meet the needs of green coffee processing in the country. Typically, in Dak Lak province, 16 wet processing factories have been established with a total annual capacity of over 64,000 tons of products. Vietnam's deep-processing coffee industry only occurred 10% of the total coffee output in the country, mainly exporting coffee kernel (coffee beans) so the value added is low.

Production of animal, poultry and aquatic feeds: in recent years, the animal feed industry has grown and developed quite well with an average growth of 13-15% per year. However, the domestic production of feed ingredients such as maize and soy-bean only meets 50-55% of domestic animal feed production and processing needs, therefore the source of animal feed and raw materials still depends heavily on imports. In 2018, it is estimated that 70% of the total raw material used for animal feed, including industrial animal feed, coming from imported sources.

In the context of deep international economic integration and increasingly complex competitive environment, many Vietnamese enterprises engaged in manufacturing, processing and trading in food industry have also been aware more clearly of the vital importance of constantly improving internal strength, technical improvement, applying advanced technology to innovate and improving product quality in order to reach and respond more appropriately to the diverse demands of consumers.

## **Discussion**

Although the agricultural product processing industry has achieved many achievements, making an important contribution to the proportion of export goods and raising the added value of agricultural products in Vietnam, it is still not commensurate with the potential and remains some limitations such as: The agricultural processing technology

capacity only reaches the world average; the quality of agricultural products is low, the processing technologies are out of date, designs and types are not plentiful and attractive, high production costs lead to poor competition, price squeezing; the equipment renovation coefficient in recent years is only 7% / year (equal to 1/2-1/3 of the minimum of many other countries); technology level of processing some agricultural products at average level; low value-added products still occurs a large proportion (about 80% of production).

Production of agricultural products with high post-harvest losses; many agricultural products are of low quality, and there is a potential for food insecurity; high production costs, low selling prices; low investment in harvesting and storage technologies has led to uneven products in both specifications and quality; restructuring of processed products towards increasing the proportion of high value-added products is still limited; the use of waste by-products to produce by-products, improving production efficiency has not been given adequate attention, supporting industries have not developed; trade and trade promotion are still limited; mechanism and policy are still inadequate; investment in agriculture and rural areas is still risky... the linkage and synchronization between agricultural production and processing and consumption are still loose; production is small, fragmented, spontaneous, storage techniques stopped at packing and store at ports with specialized cool warehouses, outdated technology affecting the product quality.

As a part of the value chain of agricultural products, the development of food processing industry must be placed in the system of solutions to upgrade Vietnam's agricultural value chain. According to Tran Cong Thang (2019), there are certain limitations at every stage of Vietnam's agricultural product value chain. High input costs, improper supplies of materials, abuse of fertilizers, chemical drugs, over-exploitation of resources are posing problems for agricultural production inputs. Meanwhile, agricultural production in Vietnam is currently fragmented, lack of cohesion, agricultural products are heterogeneous, production is improper with technical processes, and application of technology is limited while the agricultural infrastructure is lacking and weak. The domestic raw materials lacking in quantity and quality, being seasonal and precarious are the major obstacles to attract the investment in the food processing industry in Vietnam. In addition, the food market is increasingly demanding strict quality, non-tariff barriers are increasing, and businesses are lack of information on import markets (needs, tastes) find it difficult to go deeply into the value chain of importing countries in particular and the global value chains in general.

The restrictions in the food processing industry in particular and the value chain of agricultural products in general pose many issues to be solved to develop the Vietnam's food processing industry, towards advancing the position of Vietnamese food in the international market.

Firstly, each member participating in the food supply chain from farmers, manufacturers, processors and distributors should make every effort to create products that are stable, safe and affordable to the demand of customers. Especially, it is necessary to have the good connection and cooperation among chain members. In each region, each commodity needs to form "leading" processing enterprises with sufficient conditions to be the nucleus, the centre of the chain of links and the satellite enterprise as a factor to perform production of the whole industry by chain. At the same time, the state needs to promulgate a legal corridor for the value chain and links in the chain, ensuring legal interests between the parties involved, preventing the situation of enterprises or farmer households being proactive from unlinking, causing serious damage to the interests of the parties. Clearly define the obligations of the parties in the performance of the contract - this is a legal document binding responsibilities

between the parties, especially the time of harvest and payment; supplement the sanctions to deal with breaches of contract, handle specific issues arising in the process of production and dispute resolution.

Secondly, strengthening the information and forecasting of production and the market in a unified manner from the central to local levels to support organizations and individuals to guide agricultural production and business. On that basis, making or adjusting the planning of production of stable input materials for the food processing industry.

Thirdly, research and develop appropriate policies, encourage businesses to properly shift the product structure towards the deep processing, fine processing, improving the quality and proportion of products with high added value, minimize production and export of raw products. Focusing on guiding agricultural product processing enterprises to formulate and organize the implementation of advanced production processes for each product, ensuring quality, reducing the rate of consumption of supplies, raw materials and management, securing food safety, improvement, diversification of packaging forms, design product in line with consumer tastes. In addition to these policies, preferential credit packages have been renewed in terms of approaching, minimizing administrative procedures to make it easier for businesses to access.

Fourthly, there is a policy to promote research and application of processing and preserving technology of agricultural products both in specialized research units and in processing enterprises. Issuing policies to promptly support processing enterprises in renewing technologies and processing equipment, especially applying advanced agricultural preservation and processing technologies from abroad. Particularly for scientific and technological researches funded by the state budget, it is required to have beneficiaries and accept the application of these research results. In this way, new scientific institutions are more active in associating with farmers/farms or businesses to obtain research orders and operate on those orders, further strengthening the relationship between four houses in the agricultural value chain.

Fifth, the State needs to have supportive policies to identify strategic markets for each food item, signing agreements, and national commitments to ensure the lowest risk. Supporting to update the information and forecast, market analysis, quality standards to businesses and producers, building a database for each product category and each specific market. In addition, improving the support of businesses and industry associations to build and develop national brands through communication channels, trade promotion programs, and trade fairs.

## **Conclusion**

In the value chain of agricultural products, processing is the stage to create the highest added value. The development of food processing industry, typically food enterprises and agricultural enterprises, is considered to upgrade and strengthen industrial and agricultural alliances in the current period. Through the implementation of development policies of the processing industry, this industry has made a lot of achievements in raising added value, contributing to the sustainable development of the agricultural industry - Vietnam's strength. However, the food processing industry in Vietnam still has many weaknesses, the development is not commensurate with the potential, the reason is not only the internal weaknesses but also limitations in all stages of the value chain of the Vietnamese agricultural products. Therefore, the policy solutions for the development of Vietnam's food processing industry must be placed in the overall system of solutions to upgrade the value chain of agricultural products.



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