

Policy on Development of Food Processing Industry in Vietnam

Hồ Việt Hạnh*, Hồ Kim Thủy**

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Abstract: Based on the analysis of secondary data obtained on the food processing industry and relevant documents of Vietnam authorities, this study shows that the Vietnamese government has instigated many policies to support the industry's development concerning both production inputs and market outputs for processed food products. Vietnam's food processing industry has accomplished many remarkable achievements, but they are not commensurate with its development potential, namely to turn Vietnam into a agricultural product processing hub, ranked in the top ten countries in the world by 2030. It is necessary to develop appropriate policies to facilitate the food supply chain from farmers, manufacturers, processors and distributors. Such policies are crucial to create products with a stable and safe quality to meet the needs of consumers; to strengthen information and forecast work on production and marketing; to develop appropriate policies for product structure; and to research into and apply technology for processing and preserving agricultural products.

Keywords: Processing industry, food, production - processing link, Vietnam.

Subject classification: Public policy

1. Introduction

Due to the heavy impact of the COVID-19 pandemic, many Vietnamese specialty agricultural products faced a slump and falling prices, and the businesses had to asked to be bailed out when they could not export to their usual markets, especially to China. However, this chorus of “rescuing agricultural products” has been ongoing for many years as the vicious circle of “good harvests and declining prices” is unresolved. Vietnam is considered a strong country in the agricultural sector because it has many advantages in producing agricultural products that the world needs. Ranked 15th in the world in exporting agricultural products, Vietnam exports products, including typical ones such as coffee, cashew nuts, pepper, tea, rice, etc., to nearly 190 countries and territories. However, in

* Graduate Academy of Social Sciences, Vietnam Academy of Social Sciences.

Email: hanhcjs@yahoo.com

** Institute of Social Sciences of Central Highlands, Vietnam Academy of Social Sciences.

participating in the global value chain, Vietnam has only been able to supply raw agricultural inputs - the least value-generating stage in the whole process. Many agricultural products of Vietnamese origin account for a large international market share but do not have their own brand names; Vietnamese enterprises cannot participate in market regulation and agricultural products are currently sold under the brand names and labels of foreign importers and distributors which regulate and dominate the market, etc. The above situation shows that, in addition to weaknesses in organising production and markets where the processing stage is concerned, post-harvest preservation of agricultural products in the value chain of Vietnam's agricultural products industry has not yet developed, contributing little added value to this industry.

With the goal of: developing a modern, efficient, and sustainable agricultural product processing industry, meeting the needs and regulations of the consumption market, and striving to turn Vietnam into a processing centre for agricultural products ranked in the top ten countries in the world by 2030 (Government, 2022), it is necessary to put a complete strategy in place to develop the processing industry, along policies to support the industry's development. On the basis of the role of the food processing industry in the value chain of agricultural products, the development situation of Vietnam's food industry in recent years and current policies, this study identifies a number of issues relating to the policy of this sector's development in Vietnam.

2. Role of food processing industry in value chain of agricultural products

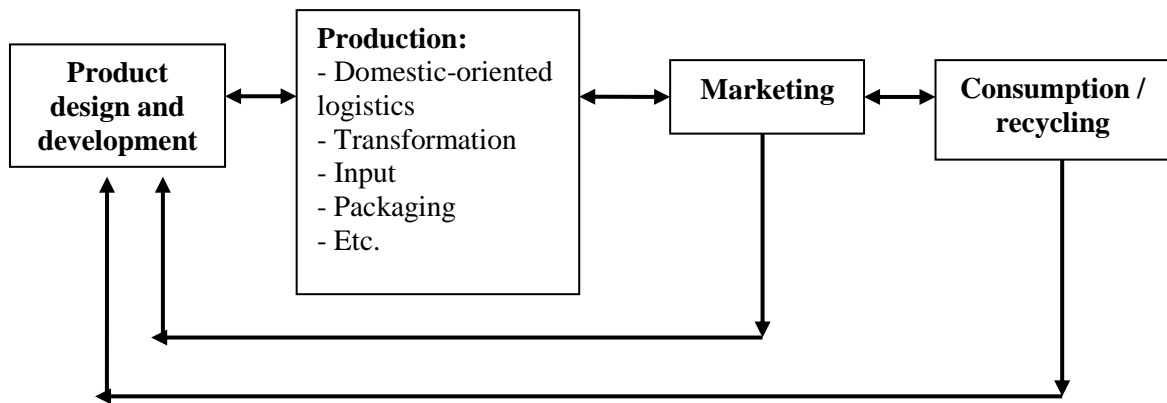
2.1. Concept of agricultural product value chain

A value chain is a concept that can simply be described as the entire series of activities required to turn a product (or a service) from conception, through the various stages of production, to distribution to the end consumer, and the way it is discarded after use (Kaplinsky and Morris, 2001). The manufacturing stages require a combination of physical transformation and the involvement of different manufacturers and services, and a chain that includes post-use product handling - as described in Figure 1 showing four links of a simple value chain. The concept of a value chain emphasises the importance of added value at each stage. Production and processing are only one of the value added components (UNIDO, 2009). Building a value chain is a highly complex, coordinated process which goes through a number of stages and involves many participants. It exists when all participants in the chain work to create maximum value throughout that chain.

In a broader sense, the concept of a value chain includes issues of organisation and coordination, strategy, and the power relationship of different actors in the chain. Macro-economic conditions, policies, laws, regulations, standards and institutions, factors such as research and innovation, human resource development and other supporting services make up an environment where all activities take place. These are also important elements and activities

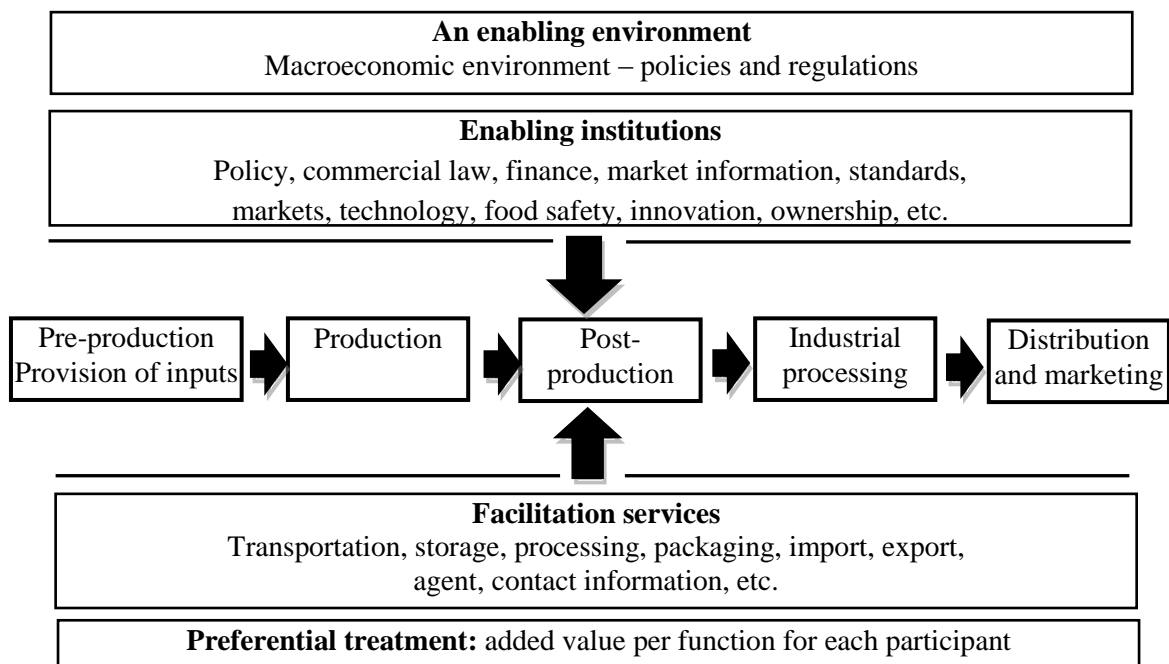
in the value chain (Figure 2). In the broad sense, in order to develop a successful value chain, in addition to the leading role of actors in carrying out development tasks, facilitators play a supporting role, creating an enabling environment for the actors in the development process.

Figure 1: Four Links in Simple Value Chain



Source: Kaplinsky and Morris, 2001.

Figure 2: Shared Value Chain



Source: UNIDO, 2009.

Value chains are extremely important in agricultural production. It defines a system of actors and activities that bring a basic agricultural product from production to final consumption, and at each stage the product gains a certain value. The chain can be a vertical link or a network of different independent business organisations, involving processing, packaging, storage, transportation, and distribution (FAO, 2010). Traditional agricultural value chains are often regulated through market transactions involving a large number of small retailers and manufacturers. Modern agricultural value chains are characterised by vertical coordination, consolidation of supply bases, agro-industrial processing, and applying standards throughout the chain (FAO, 2010). The agri-food value chain is designed to increase competitive advantage through cooperation in joint ventures, linking producers, processors, marketers, food service companies, retailers, and support groups such as shippers, research/focus groups, and suppliers.

2.2. Food processing industry increases value of agricultural products

The processing industry is an essential part of the activities for agricultural products to reach consumers, and an indispensable part to help increase the commodity value of agricultural products. Agricultural production is distinctly regional and highly seasonal. This is because agricultural production is affected by many natural, economic, social factors, and environmental conditions, etc., which vary by region; and each crop plant and livestock is only suitable for certain living conditions. Therefore, the supply of agricultural products is not continuous, unstable, coupled with a certain delay compared to the market demand, leading to unstable pricing. The dependence on natural conditions has made agricultural cultivation and the exchange of products limited. The different needs of each region require workers to always keep such factors and conditions at the forefront of their minds. The seasonality and regionality of agricultural products has led to an imbalance between supply and demand, which requires improved demand forecasting to meet the continuous needs of the market. In addition, most agricultural products are fresh, live, perishable, and quickly lose their quality after harvesting. Their storage time may be limited, and many products such as vegetables, fruit, aquatic products, and meats face transportation difficulties over long distances which require pre-processing and preserving work. In addition, places where agricultural products are sold are often located far from the place of production. This requires investment in and development of post-harvest preservation and processing technology in order to prolong the life cycle of agricultural products.

The global population is projected to grow to 9.7 billion by 2050 (UN, 2015). This increase, coupled with rising incomes in developing countries (trending dietary changes with higher levels of protein and meat intake), is driving global food demand. It is projected that by 2050, food demand will increase between 59% and 98% (Valin Hugo, et al., 2014). Moreover, nowadays the role of women in society and the workplace is expanding which means they have less time for shopping and preparing meals; therefore, there is increasing

demand for pre-processed, easy-to-prepare or instant meals, which increases the opportunities for the food processing industry.

In Vietnam, this industry is identified as a spearhead one with abundant and diverse local raw materials, and a large consumption market (both domestic and export). The industry plays an important role in promoting exports, creating jobs, increasing incomes for workers and socio-economic development, and most importantly, it is a decisive factor in the sustainable development of the country's agricultural sector, which is clearly stated in the guidelines on agricultural development of Vietnam. Resolution 26 on Agriculture, Farmers and Rural Areas (Central Executive Committee, 2008) restructuring the agricultural sector must link production with processing and markets. It is necessary to encourage all economic sectors to invest in refining the processing and deep processing industries in association with areas of raw material and markets, to step up handicraft production, and to implement conservation and development programmes for craft villages. In the master plan on development of agricultural production to 2020 and a vision to 2030 (Prime Minister, 2012), it is important that agricultural development must closely link production with preservation and the processing industry, and the consumer market; and to accumulate land for formation of concentrated commodity production areas. The project on restructuring the agricultural sector towards enhancing added value and sustainable development also clearly shows the need to link production with processing and consumption of agricultural products. As affirmed by former Prime Minister Nguyễn Xuân Phúc at the conference on "Promoting the development of the agricultural product processing industry and agricultural mechanisation" on 21 February 2020, "Without processing, it will be difficult for agricultural products to have added value, and to be able to solve the problem of seasonal availability".

3. Situation of food processing industry in Vietnam

3.1. Policy system for developing food processing industry in Vietnam

The processing industry is a material production one, including all industrial enterprises, handicraft production establishments specialised "in processing exploited products and agricultural products (General Statistics Office, 1966). The current system of Vietnamese economic sub-sectors divides the processing and manufacturing industries into 14 groups, including food production and processing. This is an industry that uses agricultural products as input materials, including processing and preserving meat and meat products, aquatic products, vegetables and fruits, producing animal and vegetable oils and fats; processing milk and dairy products; milling and flour production; producing other foods (such as sugar, tea, coffee, etc.); and producing animal, poultry and aquatic food.

With the close relationship between the food processing industry and the agricultural sector as analysed above, the policies to develop the food processing industry are not only

in the “industry sector” but also in the “agriculture sector” and are the link between the two. Realising the important role the food processing industry plays in agricultural production in particular and socio-economic development in general, over the past few years Vietnam’s government has focused greatly on improving the investment environment; promulgating policies; and organising a variety of programmes and activities to support, and promote trade and investment for domestic and foreign enterprises to encourage the renewal of internal capacity and enhancement of competitiveness in domestic and international markets. These include policies to support input and production, and policies to support output of processed food products.

- Policies to support inputs and production

In order to create a stable raw material area for processing, many policies encouraging enterprises to invest in agriculture, and the development of production cooperation, and linkage have been issued. Typically, Decision No.80/2002/QD-TTg focuses on encouraging the consumption of agricultural products through contracts; Decision No.62/2013/QD-TTg dated 25 October 2013 encourages the development of cooperation and linkage of agricultural product production associated with consumption of agricultural products, providing large fields, which stipulate preferential and supportive policies for farmers, enterprises, and farmer’s representative organisations in order to encourage linkages between production and processing and consumption of agricultural products in large field construction projects. The forms of cooperation and linkage specified in this decision include: those between farmers, representative organisations of farmers and enterprises, contractually implemented to provide input services associated with production, and consumption and processing of agricultural products in large field projects approved by competent authorities. Decree No.98/2018/ND-CP focuses on policies to encourage the development of cooperation and linkage in the production and consumption of agricultural products. Support policies to reduce losses in agriculture have also been put in place such as Decision No.68/2013/QD-TTg dated 14 November 2013 which stipulates that enterprises eligible for support must sign contracts to associate production, consumption of agricultural products, and mechanised services with cooperative groups, cooperatives or farmers.

The government has also issued policies to encourage enterprises to invest in agricultural and rural areas. Decree No.210/2013/ND-CP dated 19 December 2013 stipulates that investors, when building areas with stable raw material production linkage contracts, are given priority in terms of investment incentives and support. Policies to encourage enterprises to invest in agriculture and rural areas include support for the following areas: human resources training, market development and application of science and technology, investment in livestock and poultry slaughterhouses; investment in livestock breeding establishments, the cultivation of medicinal plants and macadamia nuts, investment in marine aquaculture, investment in facilities for drying staples such as rice, corn, potatoes, cassava, aquatic by-products, and processing coffee, investment in wood processing from specific plantations for northwest provinces and poorer areas.

By 2018, in order to continue improving incentive mechanisms and policies, and creating a favourable environment for business investment in general and agriculture and rural areas in particular, the government issued Decree No.57/2018/ND-CP on mechanisms and policies to encourage enterprise investment in agriculture and rural areas, including supporting infrastructure, taxes, renting premises for production and building factories. At the same time, the decree also aims to encourage the development of enterprises to spearhead modern agricultural sector restructuring, to adapt to climate change, and enhance added value and competitiveness of this sector. It is necessary to continue with strong reform administrative procedures in state management related to people and businesses, create favourable conditions for enterprises to increase access to resources and support state capital. In addition, it reduces support conditions to expand target support objects, creates opportunities to reduce costs of entering the market, and promotes startup businesses in agriculture and rural areas. The decree brings in many key new points in order to attract the maximum number of enterprises to invest in agriculture and rural areas. These include: enterprises implementing projects on the basis of the state's support norms and receiving post-investment support, simplifying administrative procedures, support for land acquisition, investment credit, application of science and technology, agro-forestry-fishery product processing, agricultural and rural infrastructure in order to socialise public services, etc. There has been a reduction in administrative procedures, including three construction procedures (permits for construction, planning, and design appraisal), one decision-making procedure on investment policy, and the other on technology verification. Enterprises investing in rural areas without urban planning approval now only need to submit a 1/500 scale plan to the provincial level for approval. Deciding on the policy according to the project list, enterprises will encounter fewer difficulties when undertaking each project. When a list of provincial projects is promulgated annually, enterprises proactively invest. The remaining procedures such as land, environment, fire protection, etc., are allowed to clear integrated procedures, and both construction work and completion of procedures may take place at the same time. Once there is an investment policy, the enterprise can start construction work immediately without waiting for the procedures of the Construction Permit, Change of Land Use Purpose, and an Environmental Impact Assessment Report. These procedures are completed at the same time before a plant goes into operation. The prime minister issued Decision No.858/QĐ-TTg dated 20 July 2022, approving the strategy for development of agricultural mechanisation and agro-forestry-fishery products processing by 2030, with the goal of developing a modern, efficient, and sustainable agricultural product processing industry meeting the needs and regulations of the consumption market. The aim is to turn Vietnam into an agricultural product processing hub, ranked in the top ten countries in the world by 2030.

There are encouraging results from these policies. According to the results of the 2016 Agro-Forestry-Fisheries Census, throughout Vietnam there were 2,262 models of large-field linkages. However, the proportion of large field areas contracted by enterprises for consumption differed between crop type. In particular 93% of the sugarcane area, 67.8% of

the maize area, 53.3% of the tea bud area, 26.5% of the rice area, and 10.8% of the vegetable area were planned for production in large fields and contracted by the enterprise for marketing and consumption. According to enterprise issued by the Ministry of Planning and Investment, by 2018, the number of agro-forestry-fishery enterprises numbered 9,235 reflecting an increase of 2,200 businesses compared to 2017 and an increase of 3.6 times the number of enterprises in this sector in 2010. In 2016, there were 781 enterprises (accounting for 20.3%) implementing cooperation and linkage in the production and processing of agricultural products. By 2018, Vietnam had 1,096 linkage chains, an increase of 350 chains compared to 2017. These results show that policies to strengthen linkages between production, processing, and consumption of agricultural products had initial effectiveness, encouraging many businesses to invest in agriculture and agricultural product processing.

In addition, many preferential policies on credit were also issued to support the development of agricultural enterprises. These include: Decree No.55/2015/ND-CP on credit policies for development of agriculture and rural areas, amended and supplemented by Decree No.116/2018/ND-CP; Decree No.67/2014/ND-CP on fisheries development policy amended by Decree No.17/2018/ND-CP; Decision No.1050/QD-NHNN dated 28 May 2014 of the State Bank on the pilot loan programme for linkage models in the production and consumption chain of agricultural products, models for application of science and high-tech in agricultural production according to government Resolution No.14/NQ-CP dated 5 March 2014; Decision No.813/2017/QD-NHNN dated 24 April 2017 on the loan programme to encourage the development of high-tech and clean agriculture in order to implement Decree No.30/ND-CP dated 7 March 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 was disbursed for loans under Decision No.1050/QD-NHNN, accounting for only 1.2% of the total outstanding agriculture, forestry, and fishery loans. This shows that the current preferential credit policy does not really operate effectively. According to the results of the agricultural enterprise survey in 2016 carried out by the Institute of Policy and Strategy for Agriculture and Rural Development, the current preferential credit policies in promoting the development of agribusinesses were approached in a manner supportive for interest rates but with unwieldy measures; regulations on subjects and geographical areas that can access credit stated that the areas must be experiencing difficulty while most agricultural enterprises were headquartered in cities and the delta regions; complicated loan procedures and conditions, in favour of reducing banking risks; credit forms and instruments were still limited; there were many obstacles to and limitations on mortgaging land with assets while there were no regulations to consider movable assets such as machinery and equipment, storage receipts (certificate of stored agricultural products) as movable collateral assets to be granted a loan.

- Policies to support output of processed food products

For the past few years, to support trade promotion for domestic enterprises in general and food enterprises in particular, Vietnam's government has approved the following: the National

Trade Promotion Programme, the Vietnam National Branding Programme, the Vietnam food Branding Programme, the programme to “support businesses improve their capacity in product design and development”, etc., In addition, the Ministry of Industry and Trade has been appointed to lead the implementation. Every year, many business events such as trade fairs, exhibitions, conferences, seminars, delegations of ministries and sectors, etc., have been organised to promote and popularise products and brands. Such activity has generated many domestic and foreign trade opportunities for home-grown food businesses.

In addition, seminars and talks held with the participation of representatives of relevant management agencies under the Ministry of Industry and Trade, the Ministry of Planning and Investment, the Ministry of Agriculture and Rural Development, representatives of foreign organisations, typical Vietnamese enterprises in the field of processed food, and foreign experts are periodically organised, in order to convey the most important and up-to-date information on the food processing industry in Vietnam. Here, a number of issues in the food processing industry are receiving a lot of attention by investors. These include raw material and potential consumption markets, the increasing trend of processed and convenience foods and the trend of investment in applying new technologies, enhancing added value, etc. They are an opportunity to exchange ideas and pursue discussions with state management agencies, thereby helping to solve current difficulties faced by enterprises, and domestic and foreign investors, while at the same time provide solutions to develop Vietnam’s food processing industry for the future.

3.2. Some achievements of food processing industry after policy implementation

In recent years, with the government’s attention on development support policies, the scale and modernity of the agricultural product processing industry has developed strongly. Between 2012 and 2019, the industrial production index of the food processing industry averaged 7.33% per year. Meanwhile, the agricultural product processing industry was also established and developed an industrial system of processing and preserving agricultural products with a designed capacity of up to 100 million tons of raw material per year. Over 7,500 industrial-scale enterprises were linked with exports, including more than 2,600 agricultural product processing establishments, and over 760 seafood processing businesses (GSO, 2021), etc. In addition, there are tens of thousands of small processing establishments and households carrying out preliminary processing including for domestic consumption. Agricultural product processing enterprises in Vietnam tend to be small - 70% to 80% specialising in raw processing, hence, the added value of goods is low. Some of the major processed industrial products in the food sector are shown in Table 1, in which the leading product is still milled rice with nearly 42 million tons, followed by feed for livestock, poultry and aquaculture. Seafood products are mainly processed in frozen form, and canned seafood has a modest production output, which reached only 110 tons in 2018.

Table 1: Output of Some Food Processing Industry Products

Product	2012	2013	2014	2015	2016	2017	Preliminary 2018
Milled rice (thousand tons)	39,748.00	41,017.00	42,165.00	40,770.00	38,920.00	39,326.00	41,743.00
Feed for livestock and poultry (thousand tons)	11,075.60	11,669.20	12,230.00	13,272.00	14,905.00	15,735.00	16,190.00
Aquatic feed (thousand tons)	2,553.40	2,859.50	3,238.00	3,874.00	4,393.00	4,782.00	5,218.00
Frozen seafood (thousand tons)	1,372.10	1,463.40	1,586.70	1,666.00	1,763.10	1,946.20	2,133.10
Sugar (thousand tons)	1,634.30	1,860.30	1,863.40	1,842.10	1,695.30	1,747.50	1,927.90
Fresh milk (million litres)	701.3	760.7	846.5	1,027.90	1,105.50	1,211.40	1,258.40
Refined vegetable oil (thousand tons)	631.6	826.5	862.9	966.1	1,034.70	1,078.60	1,166.30
Fish sauce (million litres)	306	325.8	334.4	339.5	372.2	373.7	374.2
MSG (thousand tons)	255.8	251.6	252.7	263.3	277.5	279.9	285.9
Processed tea (thousand tons)	193.3	187.6	179.8	167.8	165.4	170.5	169.4
Powdered milk (thousand tons)	81.2	87	90.2	99.3	107.7	111.7	121.0
Coffee powder and instant coffee (thousand tons)	92	91.5	90.7	87.6	95.4	99.4	106.9
Canned vegetables (thousand tons)	60.42	62.37	63.06	65.10	69.13	74.26	79.06
Canned fruits and seeds (thousand tons)	50	48.9	47.8	49.2	53.7	56.2	56.9
Canned meat (thousand tons)	5.52	4.57	4.09	4.38	4.31	4.09	3.95
Canned seafood (thousand tons)	0.10	0.11	0.10	0.10	0.10	0.11	0.11

Source: General Statistics Office of Vietnam (www.gso.gov.vn).

Among the main Vietnamese exports (Table 2), in addition to traditional agricultural products, which continue to maintain an annual export turnover of USD 1 billion or more, a number of processed food products have gradually appeared in the list with a modest export value which also contribute to increasing the country's export turnover, as well as showing the recent development of the processing industry. These include starches and cereals, milk and dairy products, and frozen and processed meats. Notably, the output of processed fruit and vegetable products has risen, with the breakthrough of this sub-industry in export turnover in recent years, and its presence in the group of industries with an export turnover of over USD 3 billion (Mai Hoa, 2022). This is considered a key industry in crop restructuring in Vietnam. In this product group, dragon fruit is an emerging export item in recent years, alongside guava and lychee. Dragon fruit is grown in 60 of 63 provinces; its export value reached USD 1.2 billion in 2018 (VITIC), which accounted for 28.9% of the total export turnover of fruit and vegetables nationwide.

Processing and preserving meat and meat products: The proportion of processed meat in Vietnam in general remains low. Since the year 2000, processed meat production accounts for 20-25% of total meat production. Most of the meat products are consumed domestically (Department of Livestock Production, 2020). Currently, across Vietnam there are 28 industrial-scale meat processing factories and 17,129 livestock and poultry slaughterhouses, of which 94.4% are small establishments (Industry and Trade Magazine, 2011). The country's meat processing industry is being formed and is in a developmental stage, from slaughter to processing and consumption on a large scale. There are still only a small number of factories benefiting from advanced technological equipment, while many facilities are ineffective due to problems of raw material supply, the market, and in particular the high price of raw meat input. For private establishments processing traditional food such as salted shredded meat, meat pies, and spring rolls, they primarily use semi-mechanised machines for grinding and pressing, and their equipment technology capacity is still manually based. In general, the technological level of Vietnam's meat processing industry remains backward.

Processing and preserving seafood and seafood products: The seafood processing industry is developing into a spearhead economic sector, a large commodity production industry, and a leader in international economic integration. Vietnam's processed seafood products are very rich and can be divided into the following categories: frozen, dried, and canned fish, and fish sauce. The output of processed seafood for export and domestic consumption numbers 4.5 to 5 million tons per year, with about 2 million tons of consumed fresh and live products. There are 636 industrial processing establishments associated with export and over 3,000 small processing operations associated with domestic consumption. The cold storage capacity accommodates about 600 thousand tons. The total processing capacity is about 2.5 million tons of products per year, while the overall design capacity utilisation rate stands at 65%. The product structure is as follows: frozen products 80%; dry products 7%; fish sauce related products 5%; and other products 8%. The average value-added product ratio is over 30% depending on the type of seafood item (VASEP).

Processing and preserving vegetables and fruits: The area, productivity and output of fruit and vegetable production have continuously increased over the past ten years, and are estimated to be more than 25 million tons per year. In particular, the fruit sector has increased at an average annual growth rate of more than 4.2%, and 4.9% in productivity and 9.2% in volume. Exports have steadily risen with an annual growth rate of 30.6% from 2010 to 2018 and 22% per year during 2010 and 2019. The market has been expanded to 50 countries. With the potential for future development, this industry has attracted a lot of domestic and foreign investment. In 2019, there were 2,756 newly established enterprises, an increase of 25.3% compared to 2018, bringing the total number of agricultural enterprises to 12,581 representing 36.23% increase.

Processed fruit and vegetable products are mainly: canned, frozen, mashed, concentrated, jam, fried, fermented, and salted, etc. Of these, the proportion of canned products accounts for 50%, while concentrated and frozen products sold to many markets tends to develop strongly. The collection, selection, and preservation stages are still done manually. The post-harvest loss rate is up to 20-25%; preservation technology and means of transport are insufficient and outdated, coupled with low quality and high cost (Natural Resources and Environment Online newspaper 2018). Currently, there are only about 145 processing facilities with a capacity of approximately 1.2 million tons per year. A number of large corporations and enterprises have stepped up their investment in high-tech equipment for the production and processing of vegetables and fruit. In 2019, there were 17 projects with a total investment of over VND 20,000 billion. With the goal of increasing processing capacity to 25% of output (equivalent to more than 6 million tons per year), investment opportunities in the fruit and vegetable processing sub-sector are still wide open (Lâm Nguyễn, 2019).

Production of animal and vegetable oils and fats: Vietnam's vegetable oil industry currently uses both domestically produced crude oils (mainly from sesame, peanuts, and rice bran) and imported crude and refined oils (mainly palm and soybean oils) for the production process. The products of this industry are divided into four groups: cooking oil, salad oil, nutritional oil, and solid oil. Currently, cooking oil processing enterprises supply only 30% of the domestic market demand. Despite the great market potential, this industry currently faces many difficulties that are not easily solvable. They include high dependence on imported materials and the competitiveness of domestic enterprises which is still poor compared to their foreign counterparts.

Processing milk and dairy products: Vietnam is emerging as one of the countries with a dynamic dairy production and processing industry, especially in recent years. Like many other milk producing and processing countries, Vietnam's dairy industry also faces a shortage of supply to serve the domestic and export markets. As of 2016, the country had more than 80 enterprises with hundreds of brands, of which 10 were medium and large-scale dairy enterprises accounting for 26 milk processing factories, while the remainder were micro and small dairy businesses (investvietnam.gov.vn). Enterprises participating in the dairy production and processing industry in Vietnam include both foreign-invested and

home grown enterprises. While the competition between domestic milk production and processing enterprises with imported milk brands brings great challenges to Vietnam's dairy industry, it also opens up many opportunities to develop and dominate the market.

Milling and production of flour: Vietnam currently has 580 industrial-scale milling establishments with a capacity of 10 million tons per year (Lâm Nguyễn, 2020) and a total storage capacity of 7 million tons of rice. In terms of processing technology equipment, large-scale rice processing businesses have become mechanised, many of which are at an average advanced level compared to other countries in the region. However, deep processing and diversification of rice and rice products have not been developed yet, and rice by-products (husk, bran, straw, etc.) have not been processed to improve added value and enhance production efficiency.

Other food production (sugar, tea, coffee, etc.): Vietnam is the seventh largest tea producer and the fifth largest tea exporter in the world, with 124,000 hectares of tea plantations and more than 500 production and processing facilities, reaching a capacity of over 500,000 tons of dry tea per year. Although tea is one of Vietnam's product strengths, its preservation and processing remains backward. In the processing stage, finding ways to reduce tannin - a characteristic substance in tea which is not good for health - has not been carried out, while tea growers are not capable enough and the state still pays no attention. Therefore, Vietnam still mainly exports tea as a raw material, priced at only 60-70% of world prices (Nguyễn Hạnh, 2018).

Vietnam's sugar manufacturing is still a fledgling industry in early stages of development (Ngô Thị Thanh Tâm, 2017). Among agricultural crops cultivated in Vietnam, sugarcane is the one most closely connected between farmers and processing enterprises through investment contracts and product consumption. Currently, there are 41 sugar factories distributed from north to south. The production scale is still quite small, the sugarcane area and sugar output account for 1.16% and 0.85% respectively and globally (Thu Thủy, 2017). However, the consumption of sugarcane in Vietnam's sugar production process is very high. Up to 14 tons of sugarcane produce 1 ton of sugar, while this rate is much lower in other countries, for example, in Thailand and Brazil only about 8-9 tons of sugarcane yields 1 ton of sugar.

Vietnamese pepper is processed into three main products: black pepper (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, of which there are 15 leading enterprises, accounting for 70% of the country's export volume. In particular, there are five foreign-invested enterprises, accounting for nearly 30% of the export market share. Pepper products are mainly sold for export, accounting for 95%, with domestic consumption taking a 5% share. In general, Vietnam's pepper processing technology has reached international world standards. Enterprises with high-tech processing plants, according to ASTA, ESA, JSSA standards, create a variety of products such as black pepper, whole white pepper, and ground pepper, as well as small packaging items. But overall,

Vietnamese pepper is still mainly exported in its raw form, and its value is lower compared to the selling price of India and Malaysia (peppervietnam.com).

Vietnam has become the world's largest cashew nut exporter and cashew kernels are now included in the country's product list of main agricultural exports. However, the domestic cashew processing industry is facing many inadequacies and difficulties in terms of raw materials, most of which must be imported for processing. Hence, the industry's profit is not high. This poses an urgent problem in completing the planning of concentrated raw materials, and linking production along the value chain from farmers to enterprises.

Coffee in Vietnam is processed mainly through three types of operations: as a small-scale household processing craft, coffee bean processing factories, and powdered coffee processing plants. Selective harvesting, which selects ripe coffee berries leaving the unripe ones to continue developing, is not really common in Vietnam. In most coffee growing areas farmers usually strip both ripe and unripe berries. This results in the uneven quality of raw material. The most common processing technique in Vietnam is still the natural drying method after harvest. Here, coffee is dried in the sun or in a mechanical dryer. Currently, almost 80% of post-harvest processing is done by sunlight. However, coffee farmers, producers, and traders in the Central Highlands are increasingly using machines to dry coffee berries, with dry coffee pods or charcoal used as fuel for the dryer. Meanwhile, large-scale coffee producers mainly use wet processing technology. This method is popular today and is applied in many other countries around the world. Currently, there are hundreds of factories across Vietnam using wet or dry processing technology, mainly in the Central Highlands and the southeast. The design capacity is about 1.5 million tons a year, enough to meet the needs of green coffee processing in the country. Typically, 16 wet processing plants have been established in Đắk Lắk province, generating a total annual capacity of over 64,000 tons of products. Vietnam's deep-processed coffee industry accounts for only 10% of the total production of coffee beans (mainly for export) in the country, so the added value is low.

Producing feed for livestock, poultry, and aquaculture: In recent years, the animal feed industry has grown and developed quite well at an average growth rate of 13% to 15% per year. However, the domestic output of feed ingredients, such as corn and soybean, only meets 50-55% of the domestic animal feed production and processing needs; hence, sources of animal feed and raw materials are still heavily dependent on imports. In 2018, an estimated 70% of the total source of raw materials for animal feed, including industrial animal feed, was imported.

In the context of deep international economic integration and an increasingly complex competitive environment, many Vietnamese enterprises operating in production, processing, and trading in the food industry have also realised the vital importance of constantly improving internal resources and techniques, and applying advanced technology to innovate and improve product quality to better approach and meet diverse consumer needs.

Table 2: Export Turnover of Some Agricultural Products

Product	2012	2013	2014	2015	2016	2017	Preliminary 2018
Seafood	6,088.50	6,692.60	7,825.30	6,568.80	7,036.00	8,349.20	8,787.10
Frozen shrimp	1,547.60	2,018.20	2,553.80	1,805.80	1,918.80	2,450.30	
Frozen fish	2,130.00	2,176.90	2,661.70	2,542.90	2,742.30	2,945.20	
Frozen squid	27.6	24.3	20.8	23.9	21.4	36.3	
Vegetables, flowers and fruit	827	1,073.20	1,489.00	1,839.30	2,460.90	3,507.50	3,805.60
Coffee	3,674.40	2,717.30	3,557.40	2,671.00	3,336.60	3,500.60	3,536.40
Cashew nut	1,470.10	1,646.10	1,993.60	2,397.60	2,841.50	3,515.30	3,364.30
Rice	3,673.70	2,922.70	2,935.20	2,796.30	2,159.00	2,633.50	3,060.20
Cassava and cassava products	1,351.40	1,101.80	1,138.50	1,320.30	1,001.60	1,036.80	957.7
Pepper	793.7	889.8	1,201.90	1,259.90	1,429.20	1,118.00	758.9
Food processed from starch & cereal flour	410.8	446.5	454	657.9	533.2	602.2	658.9
Milk and dairy products	122.8	115.5	92.8	217.2	228	232.9	217.1
Tea	224.8	229.4	228.1	217.2	228		
Frozen and processed meat	68.1	52.9	66.2	89.3			
Sugar	47.1	251.7	118.4	58			
Tea	224.8	229.4	228.1	217.2	228		
Animal and vegetable oils and fats	314.5	251.5	257.6	280.5	166.3	180.6	
Cinnamon	5,7	7,1	78,9	69,4	76,1	103,1	

Source: General Statistics Office of Vietnam (www.gso.gov.vn).

4. Remaining issues and policy recommendations

Although the agricultural product processing industry has made many achievements and important contributions to the proportion of exported goods and increasing the added value of Vietnamese agricultural products, it is still not commensurate with its potential and remains unsatisfactory. There are still a number of limitations, such as: agricultural product processing technology capacity is only at the world average level; low quality agricultural products, outdated processing technology, poor and unattractive designs and product types, and high production costs, leading to poor competition and adoption of low given prices in the market; equipment innovation coefficient in recent years being only 7% per year (equivalent to one half to one third of the minimum level of many other countries); the level of processing technology for a number of agricultural products being at an average level; low value-added products still accounting for a large proportion (about 80% of output).

Agricultural production with high post-harvest losses; many agricultural products are not high in quality, they are stifled by a potential risk of food insecurity and safety, high production costs, and low selling prices. Investment in harvesting and preservation technology remains low, leading to erratic product specification and quality. Restructuring of processed products towards increasing the proportion of products with high added value is still limited. The use of waste by-products to produce by-products and improve production efficiency has not been given due attention. Supporting industries have not developed. Trade and trade promotion are still limited. Policy mechanisms remain stifled by many shortcomings. Investments in agriculture and rural areas are still subject to risk. The linkage and synchronisation between the production of agricultural products and the stages of processing and consumption are still loose. Small, fragmented, spontaneous production is still popular, and preservation techniques only include packaging and storing at the port by specialised cool warehouses with outdated techniques, which adversely affects product quality, and so on.

As a stage in the value chain of agricultural products, the development of the food processing industry must be placed in the system of solutions to upgrade the value chain of Vietnamese agricultural products. According to Trần Công Thắng (2019), there are certain limitations in all stages in the value chain of Vietnam's agricultural product industry. High input costs, unsuitable materials, overuse of fertilisers and chemicals, and overexploitation of resources are problems faced by the input stage of agricultural product manufacturing. Meanwhile, agricultural production in the country is currently small and fragmented and lacking linkages. Agricultural products are heterogeneous, production is not in accordance with technical processes, and the application of technology is still limited while agricultural infrastructure is insufficient and inadequate. Domestic raw materials are poor in quantity and quality, seasonality and uncertainty. These are major obstacles to attracting investment in the food processing industry in Vietnam. In addition, the food market is facing increasingly strict requirements on quality, non-tariff barriers are increasing, enterprises lack import market

information (demands, tastes) so it is difficult to delve deeply into the value chain in the importing country in particular and the global value chain in general.

The limitations in the food processing industry in particular and in the value chain of the agricultural product industry in general pose many problems that need solving in order to develop the food processing industry in Vietnam, and improve the position of Vietnamese food items in the international market.

Firstly, each member involved in the food supply chain - from farmers, manufacturers, processors, and distributors - should make every effort to create safe and stable quality products that meet the needs of consumers. In particular, there should be good linkage and cooperation between members in the chain. In each region and each specific commodity industry, there needs to be “leading” processing enterprises that are fully qualified to act as the nucleus, the centre of the linkage chain, and satellite enterprises as a production factor in the whole chain industry. At the same time, the state needs to promulgate a legal framework for the value chain and its links, to ensure the legitimate interests of all parties involved, to prevent businesses or farmers from breaking the linkage, causing serious damage to the interests of the parties. It is necessary to clearly define the contractual obligations of the parties where legal documents bind the responsibilities between them, especially at harvest and payment time; additional sanctions for dealing with contract violations, dealing with specific problems arising in the production process, and settling disputes.

Secondly, it is important to strengthen the work of information and forecast on production and the market, to be unified from the central to local levels, and to support organisations and individuals to orientate their production and business in agriculture. On that basis, it is necessary to make or adjust the production planning of stable input material areas for the food processing industry.

Thirdly, relevant ministries and sectors need to study and develop appropriate policies, encourage enterprises to rationally shift the product structure towards deep and fine processing, improve quality and proportion of products with high added value, and minimise production and export of raw products. It is obligatory to focus on guiding agricultural product processing enterprises to develop and organise the implementation of advanced production processes for each product type, ensure quality, reduce the consumption rate of materials and raw materials, and better control food safety, improve and diversify packaging forms and product designs to suit consumer tastes. To accompany these policies there should be revised preferential credit packages in terms of approachability, minimising administrative procedures to make it easier for businesses to gain access.

Fourthly, the state should bring in more policies to promote research into and the application of technologies for processing and preserving agricultural products both in specialised research units and in processing enterprises; policies to support processing enterprises to innovate processing technology and equipment, especially applying advanced agricultural product processing and preservation technologies from overseas. In particular for scientific and technological research funded by the state budget, it is

necessary to have target beneficiaries who adopt the application of the results of such research. Thus, scientific institutions are more proactive in linking with farmers - farms or businesses to obtain research orders and work on those orders, further strengthening the relationship linking the four actors in the agricultural value chain.

Fifthly, the state needs to have supportive policies to determine a strategic market for each food item, sign agreements and have national commitments to ensure the lowest risks. It is necessary to support market information updates, forecasts, and market analysis as well as having quality standards in place for businesses and manufacturers, and build a database for each product category and specific markets. In addition, it is important to improve support for businesses and industry associations, to build and develop national brands through communication channels, trade promotion programmes, domestic and international trade exhibitions.

5. Conclusion

In the agricultural value chain, the introduction of raw products into the processing procedure helps achieve the highest added value. Developing the food processing industry, typically food businesses and agribusinesses, is considered an upgrade and consolidation of the agro-industrial alliance at this time. Through the actual implementation of policies to develop the processing industry, this sector has recorded many achievements in enhancing added value, contributing to the sustainable development of the agricultural sector, one which has comparative advantages for Vietnam. However, Vietnam's food processing industry suffers from many weaknesses. Its development is not commensurate with its potential, which is caused not only by weaknesses within the industry but also by limitations in all stages of the value chain of Vietnamese agricultural products. Therefore, 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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