CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE
FACULTY OF ECONOMICS AND MANAGEMENT
EUROPEAN AGRARIAN DIPLOMACY

MASTER'S THESIS

SOLUTIONS TO IMPROVE COCOA
EXPORT COMPETITIVENESS IN VIETNAM

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DIPLOMA THESIS ASSIGNMENT

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Thesis title

Solutions to improve cocoa export competitiveness in Vietnam

Objectives of thesis

The thesis aims to survey and evaluate the current export status of cocoa in Vietnam, analyse competitiveness factors, and propose solutions to develop cocoa exports in Vietnam.
There are three partial tasks of this dissertation:
- The current status of cocoa production, purchasing, and processing in Vietnam
- Evaluate the current status of Vietnam's cocoa exports and compare cocoa's characteristics and competitive advantages in Asia and Vietnam in particular.
- Analyse competitive factors based on the SWOT model and propose solutions to develop Vietnam's cocoa exports.

Methodology

To address the research questions of the topic, the author uses the qualitative analysis method as below:

- Synthesize research results and information from articles and information systems to assess the current situation and analyze Vietnam's competitive advantage regarding cocoa products.

- Qualitative description and descriptive statistics based on statistical survey data of experts in Vietnam, representatives of businesses, and cocoa purchasing facilities to detect outstanding problems

- Using the competitiveness analysis framework according to the SWOT model applied to the Vietnamese cocoa industry. The above information, combined with other authors' research results, is a basis for building solutions to improve Vietnam's cocoa export competitiveness.

The proposed extent of the thesis

60-80 pages

Keywords

Vietnam, cocoa, export, competitiveness

Recommended information sources

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Declaration

I have worked on my master's thesis titled "Solution to Improve Cocoa Export Competitiveness in Vietnam" by myself, and I have used only the sources mentioned at the end of the thesis. As the author of the master's thesis, I declare that the thesis does not break any copyrights.

In Prague on 28.03.2024 _____

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Solutions to improve cocoa export competitiveness in Vietnam

Abstract

In the past ten years (2014-2023), cocoa trees have attracted substantial attention in Vietnam. However, despite having a lot of export potential and being highly appreciated for its quality, Vietnamese cocoa is not well known to the world because the quantity is small and production needs to be more cohesive, mainly scattered in the provinces as an intercrop crop. The author analysed cocoa tree development's economic, technical, and social aspects through combined qualitative (in-depth interviews, group discussions) and quantitative (surveys, statistical analysis) research methods. Besides, in this thesis, the author has conducted in-depth research on analysing and evaluating Vietnam's cocoa export capacity through the SWOT model. Furthermore, the study analyses factors that affect businesses' export decisions, an issue rarely mentioned in previous research. The results show that Vietnam's cocoa industry faces many opportunities and challenges to develop production and improve global market competitiveness. With favourable natural conditions, growing market demand, and the increasing trend of healthy cocoa consumption, Vietnam can become one of the world's leading cocoa-producing and exporting countries. The author proposes that Vietnam unanimously invests in high technology from planting to transportation, develops raw materials according to technical processes, builds international brands, and expands diversified export markets to promote Vietnam's cocoa industry. At the same time, Vietnam needs to research new products from cocoa and support businesses with preferential policies, thereby enhancing its position and competing strongly in the global market.

Keywords: Vietnam, cocoa, export, competitiveness, SWOT

Řešení pro zlepšení konkurenceschopnosti vývozu kakaových plodů ve Vietnamu

Abstrakt

V posledních deseti letech (2014-2023) přitahovaly kakaovníky značnou pozornost ve Vietnamu. Nicméně, i přesto, že mají velký exportní potenciál a jsou vysoce ceněny pro svou kvalitu, vietnamské kakaové plody nejsou ve světě dobře známy, protože jejich množství je malé a produkce potřebuje být více soustředěná, hlavně rozptýlená v provinciích jako mezidruhová plodina. Autor analyzoval ekonomické, technické a sociální aspekty rozvoje kakaovníků prostřednictvím kombinovaných kvalitativních (hloubkové rozhovory, skupinové diskuse) a kvantitativních (průzkumy, statistická analýza) výzkumných metod. Kromě toho autor v této práci provedl důkladný výzkum analýzy a hodnocení exportní kapacity kakaových plodů Vietnamu prostřednictvím modelu SWOT. Dále studie analyzuje faktory, které ovlivňují rozhodnutí podniků o exportu, téma, o kterém se v předchozím výzkumu zřídka mluvilo. Výsledky ukazují, že vietnamský kakaový průmysl čelí mnoha příležitostem a výzvám ve vývoji produkce a zlepšení konkurenceschopnosti na globálním trhu. S příznivými přírodními podmínkami, rostoucím tržním poptávkou a stále se zvyšujícím trendem zdravé spotřeby kakaa může Vietnam být jedním z předních světových producentů a exportérů kakaových plodů. Autor navrhuje, aby Vietnam jednomyslně investoval do vysokých technologií od sazení po dopravu, vyvíjel suroviny podle technologických procesů, budoval mezinárodní značky a rozšiřoval různorodé exportní trhy k propagaci vietnamského kakaového průmyslu. Zároveň Vietnam potřebuje zkoumat nové výrobky z kakaových plodů a podporovat podniky preferenčními politikami, čímž posílí svou pozici a silně konkuruje na globálním trhu.

Klíčová slova: Vietnam, kakao, vývoz, konkurenceschopnost, SWOT

TABLE OF CONTENT

1. Introduction

In Vietnam, cocoa is not a new crop. Over the past century or so, the development of this crop has gone through many ups and downs. Cocoa was brought to Vietnam by the French at the end of the 19th century, right after they took control of the Indochina peninsula. Due to realizing the difficulties of developing cocoa in Vietnam, starting in 1890, the French government organized an extensive program to subsidize cocoa farmers. However, after 17 years, this program was canceled because the French realized that cocoa did not bring significant economic efficiency, which probably led to the decline of Vietnam's cocoa industry (Marou Chocolate Company, 2011)

In the last ten years, cocoa trees have attracted intense attention in Vietnam. The prolonged price decline of coffee between 2000 and 2005 can be the main reason for this attention (D. T. Ha & Shively, 2005). However, assessments of cocoa's prospects in Vietnam include optimistic and cautious opinions. Assessments by representatives of domestic and foreign companies trading in cocoa products or officials in the Vietnamese cocoa industry are often optimistic. For them, cocoa is often considered a new way out of poverty for farmers (Le, 2012) or a crop that Vietnam will succeed in like it did with rice and coffee in the past (Ai, 2011).

Cocoa trees in Vietnam have received attention for investment and development as a valuable industrial crop only over the past ten years. According to the Department of Crop Production under the Ministry of Agriculture and Rural Development, the country's cocoa area is more than 22,000 hectares, most concentrated in the Central Highlands and Mekong Delta. The current cocoa harvest area is about 11,000 hectares.

According to the Ministry of Agriculture and Rural Development, Vietnamese cocoa beans have been included in the list of cocoa with the best taste in the world by the International Cocoa Organization (ICCO) since 2015. Currently, there are 60 cocoa bean-producing countries in the world, but there are few to achieve this title. This is a massive advantage for Vietnam to participate in countries producing high-quality flavored cocoa. Mr. Nguyen Canh Cuong - Vietnam Trade Counselor in the EU and the Kingdom of Belgium, informed that Vietnamese cocoa products are considered one of the most delicious products in the world due to soil, climate characteristics, and good fermentation. In the EU, when tasting Vietnamese cocoa, many customers and businesses admire and praise it (Agro, 2018).

Although it has a lot of export potential and is highly appreciated for its quality, Vietnamese cocoa is not well known to the world because the quantity is small, production is fragmented,

mainly scattered in the provinces as a cocoa intercropped crop. According to the Vietnam Cocoa Development Coordination Board (2019), Vietnam's cocoa cultivation area was highest in 2012 at 25,700 hectares, then continuously decreased; by 2019, it was 5,028 hectares. Our country's cocoa output is only about 4,500 tons/year, accounting for only about 0.1% of total global output (more than 4 million tons/year). Ivory Coast and Ghana alone account for about 50% of the world's nut production, followed by South America and Southeast Asia. Therefore, the author conducted this research, "Solutions to improve cocoa export competitiveness in Vietnam" to review the status of Vietnam's cocoa export with affecting factors and evaluate and propose solutions to improve Vietnam's cocoa export competitiveness.

2. Objectives and Methodology

2.1 Objectives

This thesis aims to evaluate and specifically analyze Vietnam's cocoa export situation. Specifically, this article analyzes competitive factors from a strategic perspective by comparing the characteristics and competitive advantages of the cocoa industry in Asia and Vietnam from a strategic perspective SWOT model overview. This can identify the strengths, weaknesses, opportunities, and threats facing Vietnam's cocoa export industry. From these analyses, the thesis aims to set out specific and feasible solutions to develop Vietnam's cocoa exports sustainably and effectively in the coming time.

Research questions:

Question 1: What is the current status of cocoa exporting development in Vietnam?

Question 2: What is Vietnam's cocoa competitiveness according to the SWOT model?

Question 3: What must Vietnam do to focus on developing the cocoa export industry in the coming time?

2.2 Methodology

2.2.1 Data collection and processing

To evaluate Vietnam's cocoa production and export capacity, the author conducted research and analysis based on various information sources. Both primary and secondary data were used in the thesis.

Specifically, the author has compiled and analyzed secondary data from reports and studies related to Vietnam's cocoa industry's current status and development prospects. The author

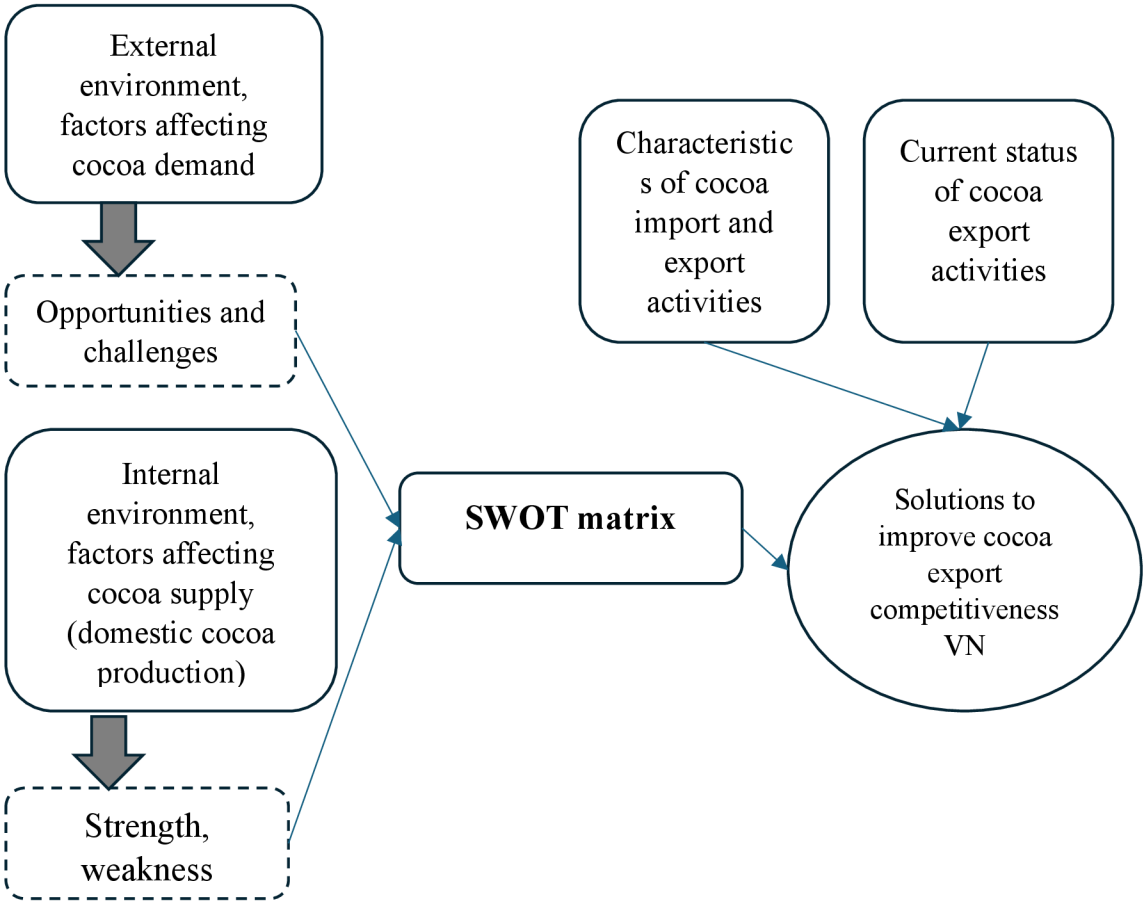
compiled the secondary data used in the thesis from The International Cocoa Organization (ICCO), the World Bank, the International Trade Center, and the World Trade Organization. In addition, the author conducted a field survey of 85 cocoa-producing and processing households in Tien Giang to collect preliminary data on the problematic situation of these households. Finally, the author interviewed more local agricultural extension officers to capture professional perspectives on the current situation and solutions to improve capacity for the Vietnamese cocoa industry.

After collecting the data, the author synthesizes and analyzes it using statistical methods, described through charts drawn from Excel.

The author uses the competitiveness analysis framework according to the SWOT model and Michael Porter's theory of national competitive advantage applied to the Vietnamese cocoa industry. From this above information, combined with the research results of other authors, the thesis gives solutions to improve Vietnam's cocoa export competitiveness.

The thesis will be conducted according to the following framework:

Scheme 1. Research framework.



(Source: Own processing)

2.2.2 SWOT matrix

In the 60s and 70s of the twentieth century, starting from the desire to find the cause of failure in building company plans, the American Stanford Research Institute (currently the International Stanford Research Institute), headed by Albert Humphrey, surveyed Fortune 500 companies (a ranking of the 500 largest companies in the United States according to each company's total income) (Hill & Westbrook, 1997). The selected companies all have "Directors of Planning" and "Councils for developing long-term business plans", operating in the UK and the US. However, all these companies admit that the costs and planning results must be improved even with these people. From this research, Albert Humphrey and his colleagues formed a tool for evaluating strategic plans called SOFT analysis to determine why strategic plans fail. In which S is "satisfactory things" (Satisfactory) in the present, O is future opportunities (Opportunity), F is current "shortcomings" (Fault), and T (Threats) are future threats.

In 1964, during the Long-Term Planning Workshop at Dolder Grand, Zurich, Urick, and Orr presented the SWOT matrix when proposing to change the letter F (Fault) to the letter W (Weakness), and from then on, SOFT officially changed to SWOT. SWOT analysis (or SWOT matrix) is a planning method based on assessing strengths, weaknesses, opportunities, and threats (Hill and Westbrook, 1997).

The SWOT model points out the strengths, weaknesses, opportunities, and challenges for the industry and business, thereby combining the development of strategies and proposing solutions to promote strengths and exploit opportunities, minimize weaknesses, and limit challenges to achieve high efficiency, big profits, and avoid risks. The types of strategies are strengths-opportunities strategy (SO), weakness-opportunity strategy (WO), strength-threat strategy (ST), and Weakness-threat strategy (WT). There are also expansion strategies that combine many factors, such as SOT, SWT, OWT, and SWOT.

Strengths and weaknesses are internal factors (internal environment) and opportunities and threats (external environment). Combining internal and external factors is the most basic and complicated issue of building and using the SWOT matrix. This requires good judgment about the relationships between factors.

Table 1. SWOT matrix

	STRENGTHS Positive characteristics and advantages of the issue, situation, or technique	**WEAKNESSES** Negative characteristics and disadvantages of the issue, situation, or technique
OPPORTUNITIES Factors, situations that can benefit, enhance or improve the issue, situation, or technique	**S-O Strategy/Analysis** *Using strengths to take advantage of opportunities*	**W-O Strategy/Analysis** *Overcoming weaknesses by taking advantage of opportunities*
THREATS Factors, situations that can hinder the issue, situation, or technique	**S-T Strategy/Analysis** *Using strengths to avoid threats*	**W-T Strategy/Analysis** *Minimize weaknesses and avoid threats*
*This figure combines definitions from three sources (shaded[21] cells; clear cells[70,71]).		

(Source: Urick & Orr, 1964)

Following the theory, the author sets up the SWOT matrix needs to go through the following steps:

- Identify the strengths of the Vietnam's cocoa industry
- Identify weaknesses of the Vietnam's cocoa industry.
- Analyze the environment and identify opportunities to develop the Vietnam's cocoa industry.
- Analyze and find external threats. These threats can be competitors, strategic changes, market fluctuations, trade diversion, or government policy changes in an unfavorable direction.
- Combine strengths and opportunities to record SO strategy results.
- Combine strengths and threats and record ST strategy results.
- Combine weaknesses and opportunities to record WO strategy results.
- Combine weaknesses and challenges and record WT strategy results.

2.2.3 Michael Porter's theory of national competitive advantage

According to this theory, the national competitive advantage of an industry is reflected in the connection of four factors forming Porter's diamond model.

Firstly, the group of factors on conditions of production factors represents the national position in terms of human resources, natural resources, capital, infrastructure, scientific and technical potential, etc.

Second, domestic demand status factors reflect the nature of market demand in that country for products and services of an industry.

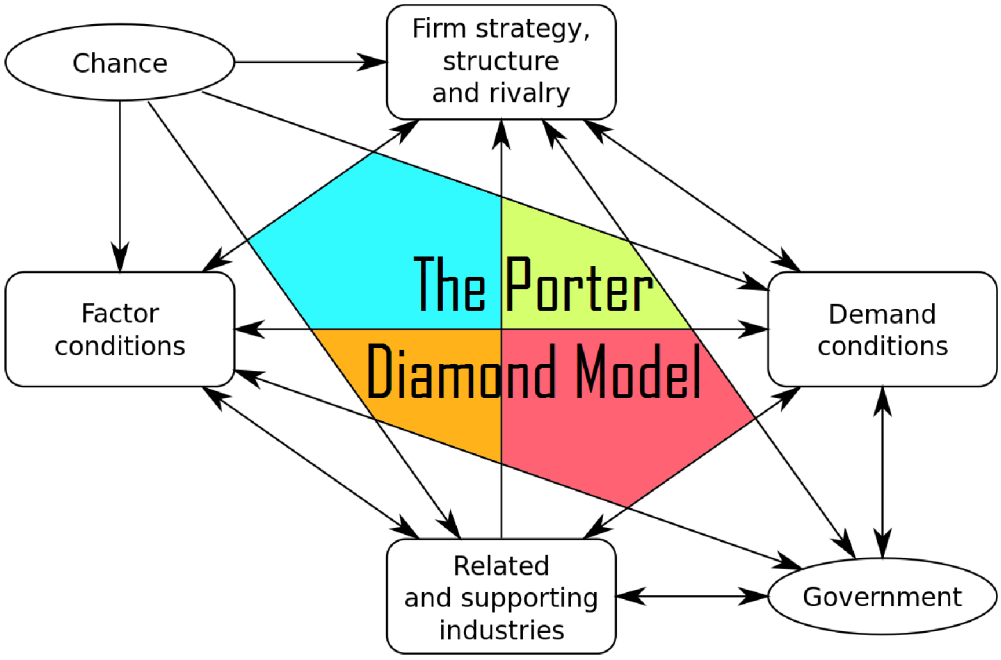
Third, business strategy, structure, and competitors represent the way and environment in which the business is established, organized, and managed, as well as the status and nature of domestic competitors.

Fourth, the current state of supporting and related industries that are internationally competitive.

In addition to the four main factors mentioned above, Michael Porter also added two additional factors:

- Unusual opportunistic factors such as Scientific inventions, biotechnology, input cost fluctuations such as currency shocks, financial and monetary markets, sudden increases in demand, force majeure events like coups, wars., etc.
- Factors belonging to the role of the Government

Scheme 2. Porter Diamond Model (Porter, 1990)



In this thesis, in addition to using SWOT to analyze, evaluate, and propose development strategies for the Vietnamese cocoa industry, identify opportunities and challenges from the outside, evaluate strengths and weaknesses from the inside, and propose development strategies associated with the internal and external environment. The author also uses Michael Porter's theory to point out the competitiveness and export development of the cocoa

industry in Vietnam through Basic factor groups such as (i) group of production conditions factors, (ii) group of domestic demand conditions, (iii) group of factors about strategy, business structure, and competitors; (iv) group of factors about supporting and related industries; (v) government and opportunities.

2.2.4 Questionnaire

For precision data collection from the field, particularly from the 85 cocoa-producing households from the in Tien Giang province, the author built the questionnaire (in Attachment) to obtain the preliminary data on the problematic situation of these households. Finally, the author interviewed more local agricultural extension officers to capture professional perspectives on the current situation and solutions to improve capacity for the Vietnamese cocoa industry. Results are mentioned in chapter 5.2.

3. Literature review

3.1 The definition of competition

The concept of competition, understood at the business level, is the struggle or wresting from several competitors for customers, market share, or resources of businesses. However, today's competition is not to destroy competitors; businesses have to create and bring customers higher or more novel added values so the customers can choose them instead of competitors (Porter, 1996). There are many economic and management theories about competition, of which the two most mentioned concepts are competitiveness and competitive advantage in explaining differences in the performance of competition between economic entities (countries, industries, companies, households).

In general, when determining the competitiveness of a business or industry, it is necessary to consider the potential to produce a good or service at a price that meets two conditions: (i) equal or lower than the standard price level, and (ii) no subsidies are required. Competition is one of the essential driving forces to promote production development, forcing producers to be dynamic, responsive, and proactive, improve techniques, apply science and technology, and perfect management organization to improve labor productivity and economic efficiency. Where there is a need for more competition or signs of monopoly, it is often stagnant and underdeveloped. Besides the positive aspects, competition also has adverse effects expressed in unfair competition, which are actions that violate ethics or the law, such as smuggling, tax evasion, spreading sabotage news, or competitive behaviors that divide rich and poor and damage the ecological environment.

3.2 The definition of competitiveness

Up to now, quite a few articles have mentioned the concept of competitiveness, but there still needs to be a consensus. From a micro perspective, competitiveness is the ability of an enterprise to produce products consistently and profitably to satisfy the strict quality requirements of the market as well as price (Domazet, 2012). Competitiveness at the enterprise level is closely related to long-term operating efficiency and higher investment returns for owners (Yap, 2004).

From a macro perspective, a country's competitiveness is a field of economic theory, analysis of the current situation, and policies to shape a country's ability to maintain and build a sustainable environment. to create more value for individuals and domestic entities (Garelli, 2006). The World Economic Forum (Schwab, 2013) defines *competitiveness* as the combination of institutions, policies, and factors that impact national prosperity.

At the local level, Newall (1992) argues that to build competitiveness, localities need to focus on human development while also on development and improving quality of life. Webster and Muller (2000) emphasized the driving forces of economic development, identifying four main groups: economic structure, territorial resources, human resources, and institutional environment. Nguyen and colleagues (2018) measure local competitiveness through four components: infrastructure, resources, quality of life, and local management capacity. Cheshire and Gordon (1998) suggested territorial competition involves agencies representing regions to enhance their positional advantages by managing and developing specific attributes that contribute to local values.

In Michael Porter's framework of competitiveness analysis, the productivity of using resources (including capital, labor, land, and other resources) plays a central role because it is the most accurate and uniquely meaningful measurement of competitiveness. On the other hand, it is a factor that determines the prosperity of localities. There are three groups of factors that determine a country's competitiveness, including (i) The country's natural advantage factors, (ii) macro competitiveness, and (iii) micro competitiveness.

The fundamental factors that determine local productivity are divided into three groups: the first is "existing local advantage factors", the second is "competitiveness at the local level", and the third group of factors is "competitiveness at the enterprise level".

- Locally available advantageous factors, including natural resources, geographical location, or local scale. These factors are not only quantity but also include

abundance, quality, usability, land cost, climatic conditions, area and topography, mineral resources, water sources, etc.

- Competitiveness at the local level, includes factors that make up the business's operating environment. A business's operating environment is a combination of factors that affect the competitiveness of businesses, from thinking, opinions, and attitudes to behavior, creativity, and entrepreneurial spirit. These factors can be divided into two main groups, including (i) the quality of social infrastructure and political, legal, cultural, social, educational, and medical institutions; (ii) economic institutions and policies such as fiscal policy, credit, and economic structure.
- Competitiveness at the enterprise level: These factors directly impact enterprise productivity, including the quality of the business environment and technical infrastructure, level of industry cluster development, business operations, and strategies. The business environment is the external condition that helps businesses achieve the highest level of productivity and innovation.

3.3 The definition of export

Many research works have generally mentioned and analyzed the export concept for each specific research purpose. Bui Xuan Luu (2001) defined "export as the sale of goods and services to foreign countries" in the Foreign Trade Economics textbook. Feenstra and Taylor (2008) give another definition of export in the International Trade textbook: "Countries buy and sell goods and services from each other. Exports are products sold from one country to another." Here, export is understood as exchanging goods and services of a country with the rest of the world through buying and selling to fully exploit the country's advantages in the international division of labor.

Some authors have given specific definitions of commodity exports. John J.Wild (2003) stated in the book "International Business - The Challenges of Globalization" that transferring goods from one country to another is considered exporting. Joshi (2005) also agrees with John J. Wild's view on exporting goods in research work on international marketing activities but adds a definition of the parties participating in the export of goods: an exporter is a seller of products based in the exporting country, while an importer is a buyer located abroad. Exporting goods is the sale of domestically produced goods to external markets in international trade.

According to the Vietnam Open Education Resources Library (VOER), export is an essential foreign trade activity; it has long appeared and is increasingly developing. From the first

fundamental form of exchanging goods between countries, it has developed and is expressed through many forms. Today's export activities occur globally, in all industries and sectors of the economy, not only tangible goods but also intangible goods with an increasingly large proportion. Exporting goods is distributing and circulating goods in an expanded process of remanufacturing goods to link one country's production and consumption with another. That activity does not only occur between separate individuals but involves the entire economic system with the management of the state.

Exporting goods is an international trading activity. Exporting goods plays a huge role in the socio-economic development of each country. How a country's social production develops depends significantly on export activities. Through exports, it is possible to increase foreign exchange earnings, improve the balance of payments, increase budget revenue, stimulate technological innovation, change economic structure, create jobs, and improve people's living standards. For countries with a low economic level like ours, the potential factors are natural resources and labor, while the lacking factors are capital, market, and management ability. The export-oriented strategy is an open solution for the economy to take advantage of foreign capital and technology, combining them with domestic potential in labor and natural resources to create substantial growth for the economy, contributing to shortening the gap with rich countries.

By nature, exporting goods is not a single business activity but a system of organized business activities under the management and supervision of state levels, both in internal and external sources, to bring profit and foreign currency while promoting production and economic development for countries. This activity aims to exploit each country's advantages in the international division of labor. When the exchange of goods between countries is beneficial, all countries actively participate in expanding this activity.

Thus, in general, export activities, first of all, are activities of exchanging goods and services of a country with other countries in the world in the form of buying and selling through market relationships. Next, exporting aims to earn foreign exchange, increase savings for the state budget, develop production and business, exploit the country's potential advantages, and improve the quality of people's lives.

3.3.1 Forms of exporting goods

Export can be classified into the following main groups:

- Direct export

A form of export in which the seller and buyer communicate directly with each other (by meeting, by letter, by telegram) to discuss agreements on goods, prices, and other transaction conditions. This form has the advantage that profits are higher than other forms because there is no intermediary. In today's modern international trade conditions, as a direct seller, the seller can enhance his reputation by ensuring the specifications and quality of goods and meeting buyers' needs. However, this form requires the seller to be quick with information (market, price, non-tariff barriers, etc.), and at the same time, during the sales process, they can also face the same risks as the buyer, such as late payment or exchange rate changes, etc.

- Export through intermediaries.

It is a form of international trading carried out with the help of a third intermediary factor, and this factor will receive a certain amount of money from the above trading activity. Standard intermediaries in international transactions are agents and brokers. This form will reduce the seller's profits due to having to pay intermediaries. However, this is a form used quite commonly today in many impoverished and developing countries because intermediaries often have a better understanding of the market (needs, tastes, specialties), so the opportunity to earn high profits will be more significant.

- Form of re-export

It is a form of re-exporting to other purchasing countries purchased goods that have not been processed in the re-exporting country. The purpose of performing a re-export transaction is to buy goods in one country and then sell them at a higher price in another country and earn more than the initial capital spent.

Re-export activities have two forms: temporary import-re-export form and border-gate transfer form, in which:

- The form of temporary import-re-export is understood as the trader of country A buying goods from country B to sell to country C based on a foreign trade contract and carrying out procedures to import goods into country A. Then, these same goods are exported out of country A without processing. This form can earn high profits while not requiring investment costs (machinery and equipment) and the ability to recover capital quickly. However, this form is only suitable for specific products in the context of strong international trade development.

- Forms of border transfer are divided into two types. Firstly, after entering the country, the customs authority will transport the goods to another customs location to complete import customs procedures. Second, the goods at the original place of transport have gone through

import-export customs procedures and are transported to a place of exit, supervised and managed by the customs of the place of exit. This form has the advantage of not spending initial investment costs, but the legal procedures are pretty complicated. There are always two separate contracts in the transaction process: the purchase contract (signed by a Vietnamese representative with the exporting country) and the sales contract (signed by a Vietnamese representative with the importing country).

3.3.2 The role of export in Vietnam's economy

- First, exports create capital for imports, serving Vietnam's Industrialization and Modernization.

Samuelson believes developing countries are caught in a "vicious cycle" of poverty (Samuelson, 1964). Therefore, to break the cycle, there needs to be a "push" from the outside to help developing countries enter the "take-off stage." Applying this theory, countries that want to achieve economic growth need a push from the outside, such as factors of capital, technology, experts, etc... In which capital for imports, the country's industrialization and modernization service is one of the most critical factors. To implement the country's industrialization and modernization path, we first need to import a large amount of modern machinery and equipment from outside to equip production. Capital for import usually relies on the primary sources: loans, aid, foreign investment, and exports. Loan capital must eventually be repaid, and foreign aid and investment are limited.

Furthermore, these sources are often dependent on foreign countries, so the most important source of capital for import is export. Whichever country increases its exports, its imports will also increase. On the contrary, if imports exceed exports, the trade balance deficit will be too large, which can negatively affect the national economy.

- Second, exports contribute to economic restructuring, promoting production development.

The world's production and consumption structure has been changing exceptionally strongly. Economic restructuring in industrialization and modernization following the development trend of the world economy is inevitable for our country. Today, most countries take world market demand as the basis for organizing production. That has a positive impact on economic restructuring, promoting production development. This impact shows:

- Export creates favorable conditions for other industries to develop. Typically, developing the export textile industry will create full opportunities for developing the production of raw materials such as cotton or dyes, etc.

- Export creates the ability to expand consumption markets, contributing to stable production and development of domestic production.
- Export creates conditions to expand the ability to provide inputs for production and improve domestic production capacity.

- Third, exports play a role in promoting innovation in modern production equipment and technology.

The competitiveness of exported goods depends significantly on quality and price. Through the export process, countries' goods will officially compete in international market competition. Globalization and trade liberalization have a profound and comprehensive impact, so each country and each industry participating in international trade means participating in a playground with tremendous competitive pressure. Competition forces domestic production to innovate more modern equipment and technology, requiring production capacity and development to adapt and promote market expansion.

- Fourth, exports positively impact creating jobs and improving people's lives.

The more exports expand, the more export production activities develop, creating more jobs, attracting millions of workers to work with high incomes, and improving the lives of workers. Exports also create capital to import essential consumer materials to serve life and meet the increasingly diverse needs of the people. In addition, promoting exports also strongly impacts the process of restructuring domestic labor in both the nature of the profession and the quality of labor. Using labor appropriately can contribute to the influential forces allocation and help human resources be used more effectively.

- Fifth, export is the basis for expanding and promoting foreign economic relations.

Actively and proactively participating in international economic integration helps developing countries expand their export markets based on competitive advantages: rich natural resources, abundant labor resources, low prices, political and socio-economic stability, etc. Thanks to that, export activities have continuously grown in scale and speed, as well as essential export products, and have become a significant driving force for the development of the national economy. Promoting exports plays a role in strengthening international cooperation with other countries, enhancing the status and role of the country in the international marketplace. Exports and the export manufacturing industry promote credit funds, investment, and expansion of international transportation. On the other hand, foreign economic relations create the premise for export expansion. Through exports, it will improve social production efficiency by expanding exchanges and promoting the utilization

of the country's advantages, potentials, and opportunities, especially when export is one of the crucial goals in the foreign economic development of developing countries.

3.4 Overview of studies

3.4.1 Overview of the world's research

Coulter and Abena (2010) study on cocoa production efficiency in Cameroon is critical, providing helpful information about the cocoa production industry in this country. The authors used financial performance analysis and SWOT analysis to comprehensively assess the Cameroon cocoa industry's strengths, weaknesses, opportunities, and challenges. Research results show that Cameroon has very favorable natural conditions for growing cocoa trees, such as suitable soil, climate, and rainfall. In addition, Cameroon's domestic market is very potential due to the increasing demand for chocolate and cocoa products. However, the weakness of Cameroon's cocoa industry is that product quality does not meet export standards, and world market prices need to be better controlled. The most significant opportunity is that the Cameroon Government has a capital support policy to improve product quality, helping to expand exports. However, the cocoa industry still needs help with unstable prices, weak coordination between stakeholders in the supply chain, and low trust between parties.

In 2015, A. Rifin conducted the research paper "Marketing Channel Choice of Cocoa Farmers in Madiun Regency, East Java, Indonesia" (Rifin et al., 2015) to analyze factors affecting the consumption channel choice of cocoa farmers in Madiun district, East Java, Indonesia. The research aims to determine which types of cocoa beans farmers prioritize selling, wet or dry, fermented, or unfermented, and what factors influence the decision to sell cocoa beans to traders at the village, district, or provincial levels.

The Multinomial Logit regression model shows that age and agricultural experience affect farmers selling to district traders compared to village traders. The number of cocoa trees and price affect sales to provincial traders versus village traders.

Otchere and his colleagues conducted the research paper "Achieving Competitive Advantage through Supply Chain Integration in the Cocoa Industry: A Case Study of Olam Ghana Limited and Produce Buying Company Limited" (Otchere et al., 2013) to analyze the current state of supply chain integration (Supply Chain Integration - SCI) in Ghana's cocoa industry to propose solutions to improve operational efficiency and competitive advantage. The study's objectives include surveying the scope of SCI in the Ghanaian cocoa value chain, analysis of SCI factors in Olam and PBC (these are two exporting cocoa in Ghana); and

evaluation of how SCI leads to improved efficiency and competitive advantage. Analyzing SCI elements, SCI elements are all important, especially the ability to meet customer needs, cooperate with the company's development department, share technical information with suppliers, and collaborate with the supplier. The correlation analysis results show a positive correlation between SCI factors, operational efficiency, and competitive advantage. Specifically, applying three SCI elements (internal integration, customer integration, and supplier integration) simultaneously will lead to improved operational efficiency. Higher operational efficiency leads to competitive advantage. The study concluded that the Ghana cocoa industry needs to apply all three SCI elements synchronously. It is necessary to use information technology to connect and share information between partners.

Author Arifin's research (2013) analyzed the competitiveness and sustainability of Indonesia's leading agricultural export industries, including coffee, cocoa, tea, rubber, cashew nuts, and mango. The purpose is to propose policies to improve operational efficiency and sustainability for these value chains in the future. The study uses the potential comparative advantage analysis (RCA) method, supplemented by in-depth interviews and stakeholder discussions. The results show that mechanism improvements are recommended for coffee to improve quality. With cocoa, the research suggested cultivar expansion and sustainability-based certification. With tea, the solution is to overcome structural problems in production and consumption. Combining the development of grafted rubber varieties with forest protection should be used for rubber. For cashew nuts, certification of origin and land restoration are proposed. With mango, promoting the integrated development of highland fruit trees is necessary. To improve competitiveness and sustainability, the author believes that industries must improve smallholder production, solve sustainability issues, improve quality, invest in infrastructure, and apply appropriate science, technology, and policy. The participation of relevant parties such as the state, businesses, farmers, and social organizations is essential to achieve these goals.

In 2018, Njinyah and his colleagues conducted the research paper "The Effectiveness of Government Policies for Export Promotion on the Export Performance of SMEs Cocoa Exporters in Cameroon" (Njinyah, 2018) to evaluate the impact of the government's export promotion policies (GPEP) on the export performance of small and medium enterprises (SMEs) exporting cocoa in Cameroon. The study's objectives are to analyze the direct and indirect effects (through country- and firm-specific advantages) of GPEP on the export performance of SMEs. Using survey methods and structural modeling (SEM) analysis, the

study collected data from 101 cocoa-exporting SMEs in Cameroon. The results show that GPEP has both direct and indirect effects on SME export performance through providing country- and firm-specific advantages.

The authors' research shows that the direct impact of GPEP helps reduce operating costs and improve SME export efficiency. However, this relationship is not statistically significant. The indirect effect through national and firm advantage is positive but only statistically significant through the export marketing information variable. GPEP provides SMEs with helpful information on product quality, marketing coordination, and export procedures. Research shows that raising SMEs' awareness of GPEP is necessary to increase its effectiveness. The government needs to improve the information system on GPEP and focus on supporting export marketing information for SMEs. The research model can be applied to other developing countries.

3.4.2 Overview of Vietnam research

Research on the sustainable development of cocoa trees in-depth and comprehensively by Agrifood Consulting International (2008) in the study of the feasibility, suitability, and socio-economic benefits of developing cocoa trees in Viet Nam. Research has shown that cocoa is a crop with a high risk of contracting pests and diseases. Therefore, the use of pesticides is unavoidable for cocoa-growing households. In addition, the study also raised many important questions related to socio-economic issues throughout the cocoa product value chain, including: Who are the primary beneficiaries of the development of the cocoa growing industry? What are the desired economic and social impacts on different population groups? Which management strategy would be most appropriate to minimize the environmental, technical, economic, and social risks associated with developing the cocoa industry? Is it possible to build partnerships between the public and private sectors to support industry in sustainable development, minimizing risks?

Authors Dao Thi Lam Huong, Le Van Bon, and Pham Van Thao (2010) researched selecting new cocoa varieties, developing advanced farming techniques, and researching post-harvest treatment technology for cocoa trees in some of Vietnam's leading cocoa-growing localities such as Dak Lak, Dak Nong, Lam Dong, Ben Tre and Dong Nai. The results show that scientists have selected two new cocoa varieties, PBC 157 and PBC 159, which have high productivity of over 2 tons/ha, good quality, and resistance to pod rot disease caused by Phytophthora fungus, widely adaptable to different growing areas, so it is recognized as a suitable variety for replication. In addition, the research team also developed a technical

process for planting and caring for cocoa trees sustainably, a cocoa bean fermentation process at the household level, and effective prevention procedures for fruit rot diseases commonly found in cocoa trees.

Meanwhile, research by Le Quang Binh (2014) analyzed the main barriers to developing cocoa trees in ethnic minority communities in Dak Lak. The study uses a qualitative approach, focusing on anthropological research methods such as participant observation, group discussion, and in-depth interviews regarding archival documents. The results show that, although cocoa trees were introduced to Dak Lak since the 1980s, they have only really received attention for development since the 2000s. However, analysis of technical and economic data shows that the economic benefits of cocoa are different from other traditional industrial crops available locally, such as coffee, cashew, and rubber. Furthermore, cocoa cannot replace the role of short-term food crops in agricultural production. However, in areas that are no longer suitable for growing coffee or need to be intercropped with other industrial crops at lower densities, cocoa can be a reasonable alternative.

However, the cocoa cultivation process requires a combination of many steps, both in terms of time and effort, so it is considered a new, complex, and complicated crop for farmers, ethnic minority households. Furthermore, due to past failed experiences with cocoa and other crops, people have become cautious about expanding cocoa-growing areas. In particular, the lack of information and chaotic information, especially about product output, has caused people and local officials not to find confidence in this new tree-planting development. To overcome these limitations, the authors propose that Dak Lak province needs measures to properly allocate land and avoid fragmentation so that people have enough land for production. Planning work must be linked to implementation, not "hanging planning." Besides, there needs to be anti-monopoly solutions, ensuring a healthy competitive market and complete information about the demand for people. Businesses must also build development strategies consistent with local realities, paying more attention to the consumer market. The state needs policies to encourage and support businesses to invest in this field reasonably.

Another study by Nguyen Huu Tam and Luu Thanh Duc Hai (2016) analyzed the value chain of cocoa products in Ben Tre province. The study surveyed 268 entities participating in the value chain in four districts of Ben Tre: Chau Thanh, Giong Trom, Mo Cay Bac, and Mo Cay Nam. The results show that the current cocoa value chain has three main distribution channels, of which cocoa bean exports to foreign markets account for 85.92%. The second

potential distribution channel is the domestic market for value-added products from cocoa, such as chocolate butter, chocolate, and chocolate powder.

Ben Tre has natural land and climate conditions favorable for cocoa growing, especially the largest coconut garden area in the country, creating conditions for increasing cocoa under the canopy. However, during the farming process, farmers encounter many difficulties due to pests and frequent saltwater intrusion in the dry season. Furthermore, because this is only a secondary crop, people still need to invest in taking care of it properly. In addition, competition from other crops with more advantages has caused the cocoa area to decrease sharply from 8,243 hectares in 2012 to 1,585 hectares in 2016.

To improve the competitiveness of Ben Tre cocoa industry, the study proposed nine strategic solutions and six groups of activities. In particular, the supporting role of local authorities is identified as very important. Specifically, it is necessary to increase support for farming techniques and pest prevention for farmers, support farmers in accessing preferential loans, and create a favorable investment environment.

In addition to researching sustainable development of cocoa trees, varieties, and farming techniques, scientists are also interested in exploring processing and creating new products from cocoa with higher economic value.

In addition to researching sustainable development of cocoa trees, varieties, and farming techniques, scientists are also interested in exploring processing and creating new products from cocoa with higher economic value.

Authors Truong Thi My Dung and Nguyen Thi Phuong Thao (2016) conducted experiments to produce cocoa jam with three different recipes. The results show that the formula with 30% cocoa, 40% sugar, 10% cooking oil, and 20% water gave the best jam quality regarding sensory experience, with a sweet taste and characteristic aroma. The moisture, acidity, and microorganisms of this cocoa jam also meet the standards. Cocoa jam products can potentially develop into a typical product of the region.

Meanwhile, authors Tran and colleagues (2018) successfully produced fermented cocoa powder products with high polyphenol content. This product is rich in soluble fiber, protein, and biologically active phenolic compounds and can be used as a functional food or health protection food. The research team also determined the optimal fermentation conditions to increase polyphenol content, such as cellulase enzyme concentration of 0.5%, temperature of 45°C, and time of 24 hours.

Besides research on engineering and technology, scientists are also interested in social aspects such as people's attitudes and awareness towards cocoa trees. The study by Dang Thi Thu Thuy and colleagues (2016) in Gia Lai showed that 89% of people do not want to plant more or expand cocoa areas. The reason is risk aversion, lack of capital, and lack of production land. People also need more knowledge about cocoa-growing techniques. The study recommends increasing training, technical support, and credit so people can feel secure in developing cocoa trees.

In general, research on cocoa in Vietnam in recent times has been quite comprehensive, from breeding, cultivation, pest control, and processing to social issues. However, to sustainably develop the cocoa industry, more research is needed on consumer markets, trade promotion, planting area planning, and state support policies. In addition, applying scientific and technical advances in production to improve productivity, quality, economic efficiency, and sustainable development also needs to be paid more attention.

4. Practical part

4.1 Characteristics of the World Cocoa Industry

4.1.1 Overview of the World Cocoa Industry

- **Scale and growth trend**

In the world, cocoa is an industrial crop grown in tropical regions. The largest producing countries are the Ivory Coast, Ghana and Indonesia. The cocoa market is a global commodity market with a complex value chain from planting, harvesting, processing, and trading cocoa beans to processing essential products such as cocoa powder, chocolate, confectionery, cereals, and other cocoa products.

Cocoa beans are used as raw materials to produce cocoa powder, cocoa butter, and chocolate. The critical role of cocoa is not limited to the food industry, in which cocoa powder and cocoa butter are the main ingredients in producing chocolate and cocoa cereal confectionery. Still, with the development of the medical and pharmaceutical industry, this product also has great significance in cardiovascular health care. It is suitable for vegetarians and people on weight loss regimes.

Most cocoa beans in the world are still produced on small farms managed by households or small-scale cooperatives. However, the trend of large-scale production to increase productivity and product quality is increasingly expanding. The cocoa supply chain goes

through a complex process from the farmers' farm, local buyers/dealers, transport organizations, processors, manufacturers, chocolate makers, and distributors.

According to a market research report by Proficient Market Insights, released on May 2, 2023, global cocoa powder market sales will reach about 16 billion USD in 2021-2022 due to the epidemic's impact on COVID-19. Still, it is forecast to reach over 20 billion USD in the next five years. This conservative forecast is influenced by persistent effects such as climate change, epidemics, and the Russia-Ukraine conflict were also considered when estimating the market size.

- **Main motivations/obstacles of the market**

The global cocoa market has witnessed many strong growth motivations in recent years. First, the increasing consumption of chocolate and coco-containing products has boosted the demand for imported cocoa beans. According to the International Cocoa Organization (ICCO), the global chocolate market reached a value of 106 billion USD in 2017 and is expected to increase to 190 billion USD by 2026. The popularity of chocolate confectionery products -cola and the diversification of recipes and flavors have stimulated consumer demand, especially in Western countries.

In addition, the trend of healthy eating and athletic lifestyle drives demand for pure cocoa products, unsweetened chocolate, or cocoa used as ingredients in processed products from vegetables, fruits, and grains. This trend opens new opportunities for cocoa applications in functional foods. In addition, the pharmaceutical and cosmetics industries also began using cocoa as an ingredient, contributing to boosting demand.

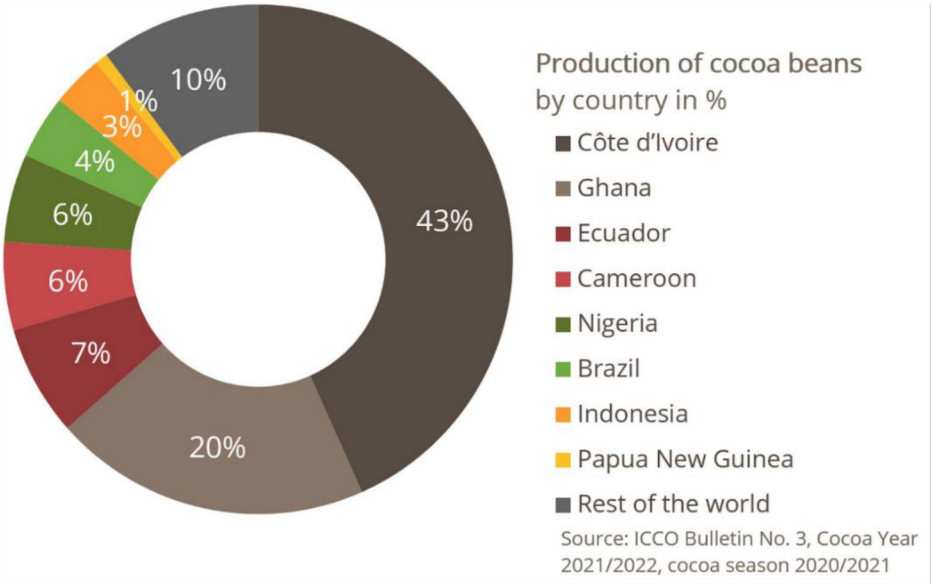
However, besides the growth drivers, the cocoa market is also facing some significant challenges. First, cocoa prices fluctuate strongly according to weather conditions, epidemics, and the supply of key producing countries such as Ivory Coast and Ghana. This causes difficulties for manufacturers and businesses. Second, cocoa tree productivity is still low and depends heavily on natural conditions. Third, input costs such as fertilizers and pesticides are increasing, pushing production costs up. Finally, climate change and heat waves also threaten cocoa production in some key growing areas.

In general, the global cocoa market is forecast to maintain good growth momentum in the coming time, thanks to increasingly diverse consumer demands. However, manufacturers and businesses should pay attention to supply, price, and production challenges for appropriate strategies. Coordination between producing and consuming countries also needs to be strengthened to promote the sustainable development of the cocoa industry.

- **Market share of cocoa production**

Cocoa is one of the most essential raw materials for producing chocolate and related products. According to the most recent statistics from the International Cocoa Organization (ICCO) in 2022, global cocoa production in the 2020/2021 crop year reached about 4,900 million tons. Of these, the African region accounts for more than 70% of world cocoa production.

Figure 1. Production of cocoa beans by country (%)



(Source: ICCO, 2021/2022)

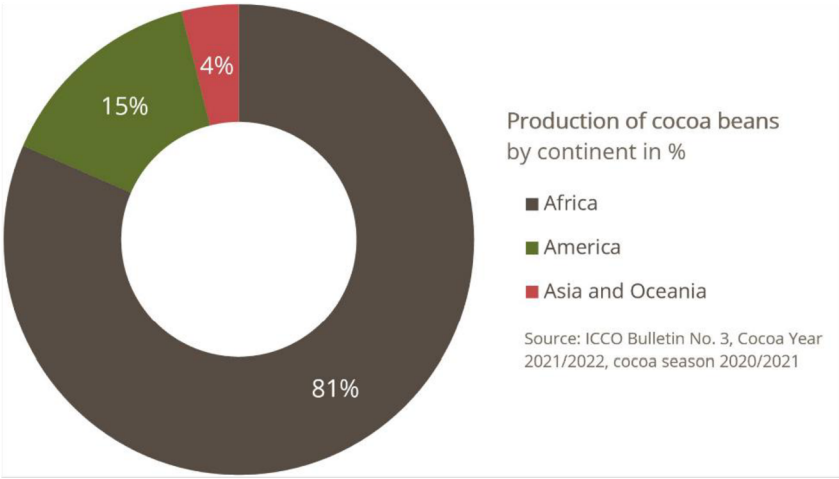
According to ICCO statistics, total global cocoa production in the 2020/2021 crop year reached about 4.9 million tons. Côte d'Ivoire continues to be the world's leading country in cocoa production, with 2.107 million tons, accounting for 43% of the global production market share. This country is also the world's largest exporter of cocoa beans, accounting for about 40% of total global cocoa exports.

Ghana ranks second in cocoa production with 980 thousand tons, equivalent to 20% of the global market share. Ghana is the world's second-largest cocoa exporter after Côte d'Ivoire. Thus, Côte d'Ivoire and Ghana account for 63% of world cocoa production.

Three countries, Ecuador, Cameroon, and Nigeria are among the top 5 cocoa bean producers in the world, with market shares of 7%, 6% and 6% respectively. Brazil and Indonesia also contribute significantly to the global cocoa supply, with output reaching 196 thousand tons (4% market share) and 147 thousand tons (3% market share), respectively. The remaining countries account for about 10% of world cocoa production, including Papua New Guinea, with 49 thousand tons (1% market share).

African countries still dominate with 4 of the world's top 5 cocoa producing countries: Côte d'Ivoire, Ghana, Cameroon, and Nigeria. The Americas also contribute significantly with the participation of Ecuador and Brazil, while in Asia, only Indonesia is in the top 10.

Figure 2. Production of cocoa beans by continent (%)



(Source: ICCO, 2021-2022)

Table 2. Cocoa bean production capacity calculated by continent in the crop year 2020 - 2021

Continent	Outputs (thousand tons)	Market share (%)
Africa	3,969	81%
America	735	15%
Asia and Oceania	196	4%
Total	4,900	100%

(Source: ICCO, 2022)

In terms of supply structure, the African region leads in output with 3.97 million tons, accounting for 81% of global total production, followed by America with 735 thousand tons, accounting for 15%; Asia and Oceania reached an output of 196 thousand tons, accounting for 4%.

In Asia, Indonesia leads in output with 147 thousand tons but only contributes more than 3% of the global cocoa bean output. Having the same tropical weather conditions as Indonesia, Vietnam's cocoa output only reaches about 4.5 thousand tons per year.

Currently, cocoa production in Asia accounts for just over 3% of total global cocoa production. However, this region is gradually becoming an important production center due

to the increasing demand for chocolate and cocoa products in developing countries. According to ICCO data (2021), Indonesia is Asia's leading cocoa producer, with about 160 thousand tons per year, equivalent to 3% of global output. Indonesia's cocoa production is concentrated mainly in the islands of Sulawesi and Sumatra. The central growing regions include West Sulawesi, South Sulawesi, Lampung, and Bali. Indonesia's cocoa growing area is estimated to reach 550 thousand hectares by 2021, doubling compared to 2016. The Indonesian government aims to make the country the world's leading cocoa producer by 2045.

Malaysia is the second largest cocoa producer in Asia, with about 65 thousand tons per year, equivalent to 1.3% of global output. The Cocoa growing area in Malaysia is estimated at 140 thousand hectares, mainly concentrated in Sabah. The Malaysian government aims to increase production to 100 thousand tons by 2025 through the Malaysia Cocoa Board program. Papua New Guinea ranks third in Asia in cocoa production, reaching about 50 thousand tons annually, equivalent to 1% of global output. The estimated planting area is 160 thousand hectares and tends to increase due to government incentive policies. Cocoa helps generate income for millions of people in rural Papua New Guinea.

In addition to the above three countries, several countries are emerging as potential cocoa producers in Asia, such as the Philippines, India, Sri Lanka, Thailand, etc. However, the output of these countries still needs to be more effective and is not significantly compared to total global output.

In general, with its economic growth potential and large population, Asia is expected to become a critical cocoa production center in the future. According to analysts, the trend of increased production in Asia-Pacific to meet growing consumer demand in emerging markets such as China and India will be the driving force to change the landscape of the global cocoa market in the future. However, Asian cocoa productivity and quality are still low compared to African countries. Therefore, Asian countries need to focus on investing in improving farming techniques and post-harvest processing to improve productivity and quality, as well as the reputation of Asian cocoa in the global market.

4.1.2 The current market situation of cocoa production and processing in the world

- **Market situation of cocoa production and processing in the world**

In April 2023, data on cocoa processing activities was published by the cocoa associations of the central producing regions. The second quarter of the 2022/23 cocoa season grew in the leading cocoa-consuming markets.

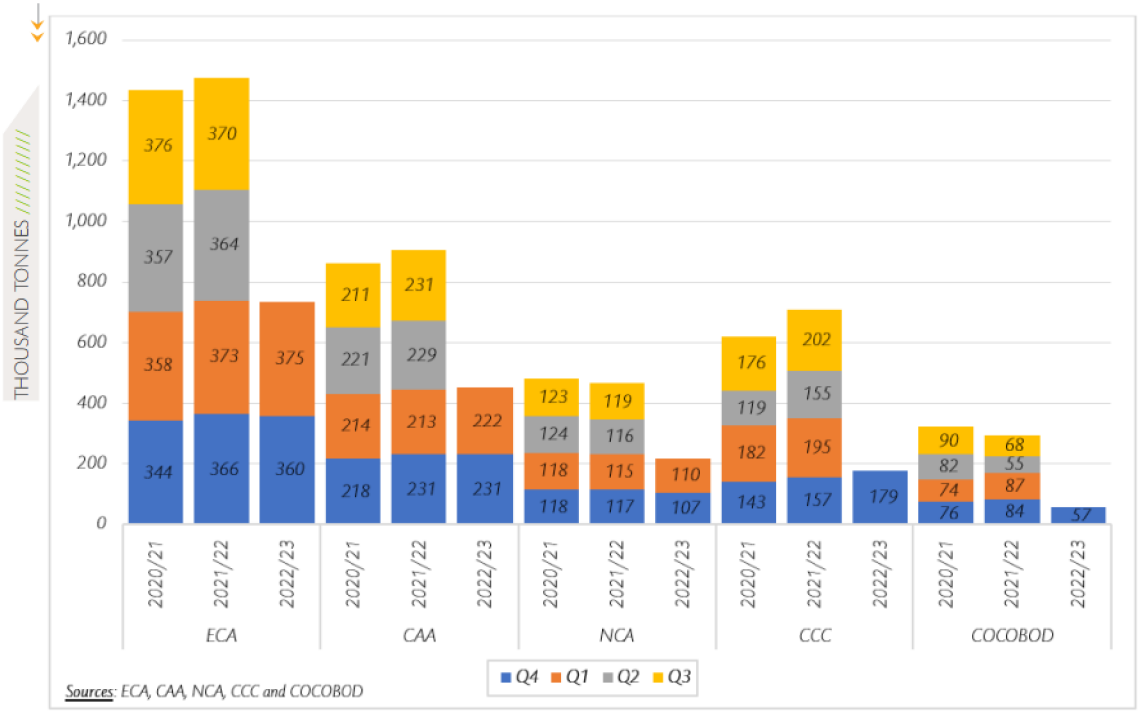
In fact, except for North America, where a year-on-year decrease in cocoa processing activity was observed in the first quarter of 2023, cocoa processing in Europe and Southeast Asia both increased. Meanwhile, cocoa processing was also reported to grow year-on-year in Côte d'Ivoire, while conversely, in Ghana, it decreased in the fourth quarter of 2022.

The figure below shows quarterly cocoa processing activity data for three cocoa associations - the European Cocoa Association (ECA), National Chemical Association (NCA), and Cocoa Association of Asia (CAA) - and two state-owned agencies regulate the cocoa industry in Côte d'Ivoire - the Coffee and Cocoa Council (CCC) - and in Ghana - Ghana Cocoa Board (COCOBOD). It should be noted that based on the latest official figures available at the time of writing, cocoa processing activity data for CCC and COCOBOD only covers the fourth quarter of the 2022-2023 cocoa season, and this trend could be reversed for Ghana in the coming quarters.

Data from the European Cocoa Association (ECA), the Cocoa Association of Asia (CAA) and the National Confectioners' Association (NCA) show that processed outputs (grinding, crushing) cocoa in these three markets in the first quarter of 2023 amounted to 707,069 tons, up 1% over the same period in 2022, specifically:

- ECA said cocoa processing increased slightly in Europe by 0.5% year-on-year, reaching 375,375 tons in the first quarter of 2023 compared to 373,498 tons recorded in the same period last year. NCA reported a 4.38% decrease in cocoa processing, reaching 109,666 tons compared to 114,694 tons recorded in the first quarter of 2023.
- In Southeast Asia, CAA posted data showing that cocoa processing activities in the region have restarted compared to the previous year in the first quarter of 2023, increasing by 4.09% from 213,313 tons in the first quarter of 2022 to 222,028 tons in the first quarter of 2023.
- In Brazil, according to the National Association of Cocoa Processing Industries (AIPC), domestic cocoa processing increased by 15.47% from 55,439 tons in the first quarter of 2022 to 64,013 tons in the first quarter of 2023. Growth in Brazil's cocoa processing was accompanied by an increase in the country's cocoa imports, nearly doubling from 15,515 tons to 34,923 tons.
- The United States NCA reported a 4.38% year-on-year decrease in cocoa processing output, or 109,666 tons, compared to 114,694 tons recorded in the first quarter of 2023.

Figure 3. Main regional cocoa associations and national agencies quarterly grindings of cocoa (2020 – 2023)



(Source: Cocoa Marketing Report, ICCO 2023)

Despite the favorable situation in regional cocoa processing in the first quarter of 2023, a completely different picture emerges when comparing regional cocoa processing data by half-year. The total half-year cocoa processing figures for ECA, CAA, and NCA for the first half of the 2022/2023 season reached 1,404,582 tons, down 1% (or 10,672 tons less) compared to 1,415,254 tons of cocoa processed during the same period of the 2021/2022 cocoa season. It should be noted that during the 2020/2021 and 2021/2022 cocoa seasons, cocoa volumes processed by members of the ECA, CAA, and NCA accounted for a significant 56% of the total global cocoa powder production.

- **Cocoa processing and trade data for the fourth quarter of 2022 to the first quarter of 2023 comparison**

Cocoa processing activity data for the first half of the 2022/2023 season for ECA shows cocoa processing in Europe reached 734,952 tons, a slight increase of 0.59% year-on-year. In the first six months of the 2022/2023 season, net imports of semi-finished cocoa products from the European Union reached 33,644 tons, down from 100,952 tons over the same period of the previous season.

Furthermore, net cocoa imports into the European Union in the fourth quarter of 2022 to the first quarter of 2023 increased by 22% year-on-year to 641,539 tons. NCA reports a 6.27% decrease in cocoa processing activity compared to the previous year, reaching 216,796 tons compared to 231,308 tons recorded in the first semester of 2021/2022. Additionally, trade data on cocoa semi-finished products for both Canada and the United States shows that in the first half of the 2022/2023 cocoa season, both countries imported 317,651 tons of cocoa semi-finished products, an increase of 17% compared to the 270,753 tons of cocoa semi-finished products imported during the same period of the previous season.

During the same period, net cocoa imports into the United States and Canada reached 241,109 tons, an increase of 15.60% over the same period last year. The rise in cocoa imports into North America is reflected in current cocoa inventory levels at exchange-tracked warehouses in the region. The decrease in cocoa processing in North America, combined with the increase in imports of semi-finished products, suggests that the excess demand for cocoa within North America is met by importing semi-finished cocoa products from other regions of the world, more specifically both countries are net importers of semi-finished cocoa products.

In Southeast Asia, CAA posted data showing that cocoa processing in the region restarted year over year in the first quarter of 2023, increasing by 4.09% from 213,313 tons in the first quarter of 2022 to 222,028 tons in the first quarter of 2023.

When preparing this report, available information on the scale of cultivation in the leading cocoa-producing countries in West Africa shows that compared to the 2021/2022 cocoa season, the 2022/2023 cocoa season is towards a supply deficit due to reduced production output. Indeed, at the end of April 2023, arrivals at Ivory Coast's export ports were reported to be lower than those recorded during the corresponding period of the previous season. By May 7, 2023, total domestic arrivals of cocoa beans reached 1.945 million tons, down 7.04% (-137,000 tons) from 2,082 million tons over the same period last year. Additionally, the country's cocoa bean exports from October 2022 to March 2023 were reported at 1,005,510 tons, a slight decrease of 0.5% compared to 1,010,080 tons exported from October 2021 to March 2022.

In Ghana, cocoa bean production in 2022/2023 is expected to exceed the level recorded in 2021/2022. The latest information shows that the volume of sorted and sealed cocoa beans purchased in Ghana is estimated to reach 576,738 tons from October 2022 to March 2023, an increase of 10.1% (+53,013 tons) from 523,725 tons purchased during the same period of

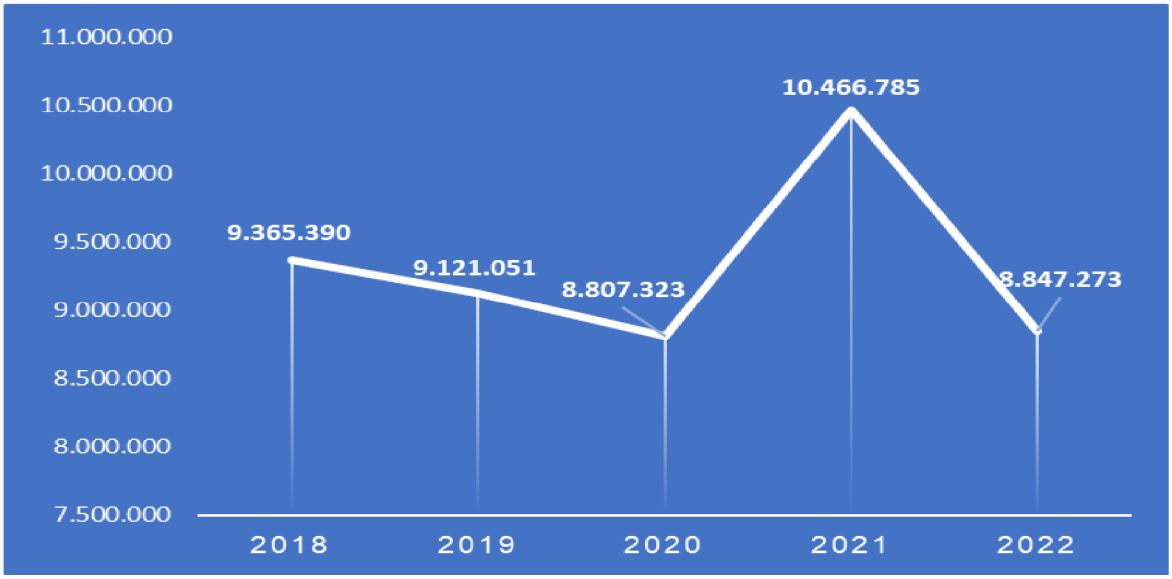
the previous season. In Brazil, cocoa production data published by AIPC shows that, in the first six months of the 2022/23 cocoa season, Brazil's cocoa output reached 79,313 tons, an increase of 9% over the same period last year (an increase of 6,286 tons) compared to the same period the previous year.

4.1.3 The export situation of cocoa products

- **Total exports of cocoa beans (HS code: 1801)**

(HS code 1801: cocoa beans, whole or broken, raw or roasted)

Figure 4. The total value of global cocoa bean exports 2018-2022 (thousand USD)



(Source: Own processing based on data of ITC)

According to statistical data from International Trade Center (ITC), the global cocoa bean export value in 2018 reached 9,365 billion USD. This number decreased slightly to 9,121 billion USD in 2019. In 2020, due to the negative impact of the COVID-19 pandemic, global cocoa bean export turnover sharply reduced to 8,807 billion USD, down 3.5% compared to 2019. It is the most significant decrease in the period 2018-2022.

However, as soon as the epidemic situation was controlled, the market began to recover strongly. Global cocoa bean export turnover in 2021 skyrocketed to 10,466 billion USD, an increase of 18.8% compared to 2020. This growth momentum could not be maintained in 2022 when the global cocoa bean export value decreased to 8,847 billion USD, down 15.5% compared to 2021. The cause is inflation and the global economic recession.

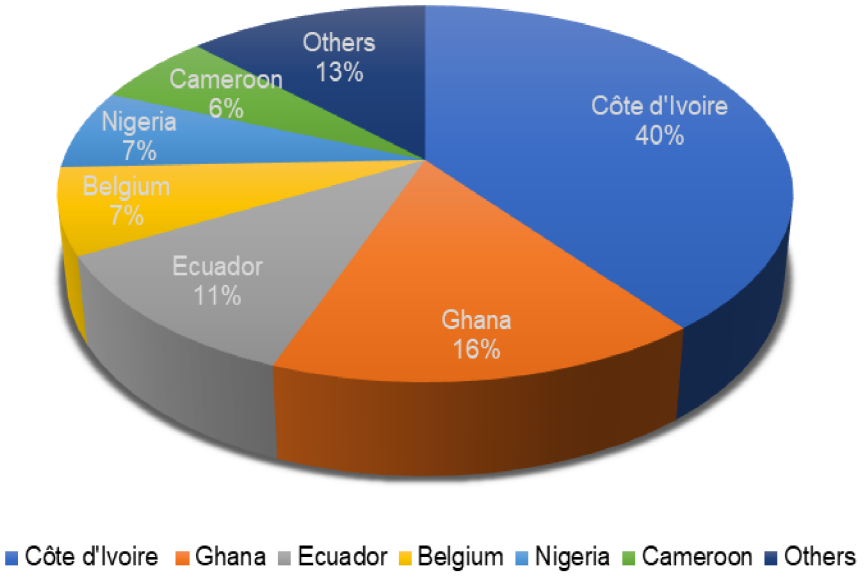
In general, the global cocoa bean export value in 2018-2022 tends to increase but is still greatly affected by the COVID-19 epidemic and macroeconomic factors. Cocoa exporters must prepare strategies to adapt to market fluctuations in an uncertain context.

Table 3. The world's leading group of cocoa bean exporters with code HS 1801 in the period 2018-2022 (regarding value) (thousand USD)

No	Market	2019	2020	2021	2022
1	Ivory Coast	3.575.416	3.628.552	4.293.227	3.205.099
2	Ghana	1.851.960	1.457.748	1.800.354	1.307.822
3	Ecuador	657.272	816.392	819.457	915.471
4	Belgium	533.847	632.978	627.059	602.130
5	Nigeria	248.809	279.499	564.118	554.710
6	Cameroon	493.015	428.285	486.025	501.183
7	Netherlands	442.270	213.178	408.854	382.761
8	Malaysia	259.643	242.542	280.007	261.769
9	Dominica	182.597	181.164	203.813	210.969
10	Peru	150.792	145.747	154.715	159.930
	Countries from 11th to 30th				
31	Vietnam	5.271	4.220	3.386	5.085

(Source: Own processing based on data of ITC)

Figure 5. Cocoa bean export proportion of countries by export value in 2022



(Source: Own processing based on data of ITC)

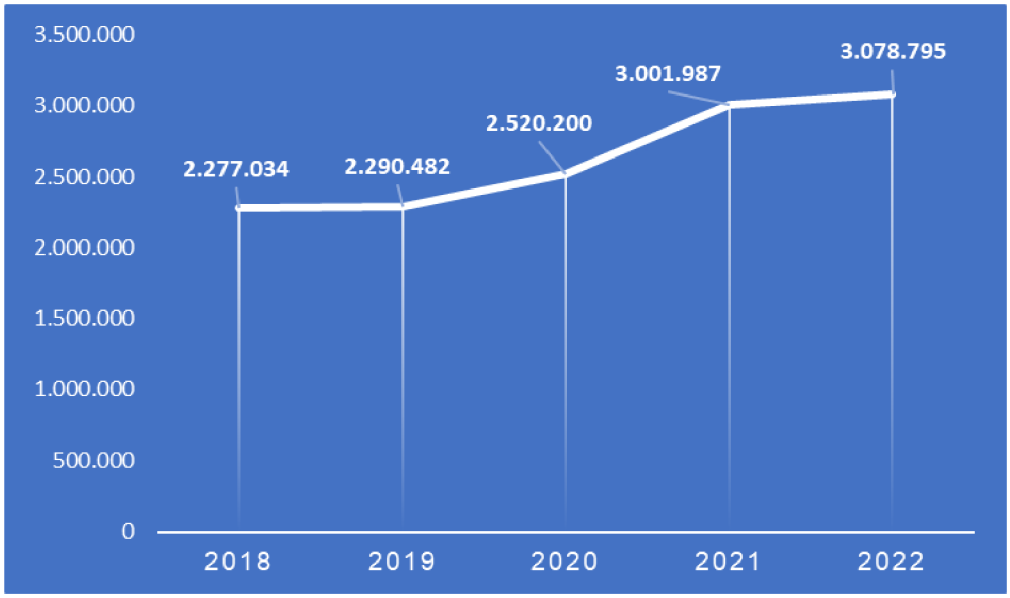
In terms of the proportion of cocoa bean exports of countries by export value, the above statistical table on cocoa export turnover of countries in 2022 shows that Ivory Coast continues to lead the world in cocoa exports with a figure of 3.2 billion USD, accounting for 36% of total global cocoa export turnover. Behind the Ivory Coast is Ghana, with export turnover reaching 1.3 billion USD, equivalent to 15% of the global market share. Ecuador holds third place with 915 million USD, accounting for 10%.

The three leading countries mentioned above account for 61% of the total world cocoa exports, once again affirming the dominance of the African region. In the top 10 largest cocoa exporting countries, there are also countries such as Belgium, Nigeria, Cameroon, Netherlands, Malaysia, Dominica, and Peru. Notably, according to ITC/WTO data, Vietnam only ranks 31st in the world in cocoa bean exports with a very modest proportion, only 0.06% of total global export turnover. It shows that Vietnam's cocoa industry is still in the early stages of development and is not asserting its position.

- **Total exports of pure cocoa powder (HS code: 1805)**

(HS code 1805: cocoa powder, not containing added sugar or other sweetening matter)

Figure 6. The total value of global cocoa powder exports 2018-2022 (thousand USD)



(Source: Own processing based on data of ITC)

Data from the International Trade Center (ITC) on exports of pure cocoa powder (HS code 18050000) for the period 2018-2022 shows that the world's export value of pure cocoa powder has a generally increasing trend despite the impacts of the Covid-19 pandemic in 2020-2021.

Specifically, in 2018, the export value of pure cocoa powder reached 2,277 billion USD. In 2019, this number increased slightly to 2,290 billion USD, about 0.6%. By 2020, despite the impact of the pandemic, the export value of pure cocoa powder still increased by 10% compared to the previous year, to 2,520 billion USD. It can be considered an impressive growth rate in the epidemic context. In 2021, export value growth continues to maintain its upward momentum, with an increase of 19% compared to 2020, to 3,002 billion USD. It shows the strong recovery of world demand for cocoa powder after the peak epidemic.

By 2022, although there will be a slowdown, export value will still maintain a high level of 3,079 billion USD, a slight increase of 2.6% compared to the previous year. This growth shows that global demand for imported cocoa powder is stable at a high level. In general, the export value of pure cocoa powder worldwide in 2018-2022 tends to grow well. It is a positive signal showing that the demand for cocoa and cocoa products is increasing globally.

Table 4. The world's leading group of cocoa powder exporters with code HS 1805 in the period 2018-2022 (in terms of value) (thousand USD)

No	Market	2018	2019	2020	2021	2022
1	Netherlands	676.282	689.869	718.784	869.196	766.724
2	Malaysia	225.910	275.292	294.597	355.681	394.541
3	Virtue	274.484	266.946	276.636	315.221	326.934
4	Indonesia	146.102	141.318	194.321	253.877	301.259
5	Spain	157.548	154.427	165.965	217.317	200.959
6	France	136.300	135.320	144.486	162.452	161.585
7	Singapore	135.069	100.873	111.930	128.705	145.400
8	Ghana	79.316	71.945	103.523	131.850	119.635
9	USA	77.977	78.853	95.585	116.108	113.504
10	Brazil	54.105	54.439	49.946	64.169	73.793
11	Ivory Coast	59.181	54.865	63.368	53.290	69.244
	Countries from 12th to 77th					
78	Vietnam	160	286	507	207	134

(Source: Own processing based on data of ITC)

The world's total export of cocoa powder code HS 1805 reaches about 3 billion USD per year, of which the Netherlands is the world's leading country in cocoa powder export, with

a stable annual export value at a high level of 700-800 million USD, accounting for about 25% of the total global export value.

Ivory Coast is the world's largest cocoa bean exporter, accounting for about 40% of global cocoa bean exports. However, with abundant raw material resources, Ivory Coast only ranks 11th in the world in exporting cocoa powder, with a value of about 60 million USD per year, much lower than other leading countries such as the Netherlands and Malaysia.

Among Asian countries, Malaysia is the region's leading country in cocoa powder exports, with a stable annual export value of 200-400 million USD. Malaysia also ranks second in the world after the Netherlands in cocoa powder export activities. Possessing high-tech processing factories and policies to attract foreign investment into the cocoa industry, Malaysia's cocoa powder products are highly appreciated for their quality, meeting strict export standards.

Indonesia is the largest cocoa producer in Southeast Asia. However, with cocoa powder export output of about 250 million USD/year, Indonesia only ranks 4th in Asia, lower than Malaysia and Singapore. It shows that Indonesia's capacity to process and export cocoa products still needs to be improved compared to its potential.

4.1.4 Main import and consumption markets

- **Overview**

North America, especially the United States, is critical in the world cocoa bean market. Any changes in the US market could have a significant impact on market development trends. Up to 2026, the North American market is expected to grow significantly. It can be attributed to the high adoption of advanced technologies in the processing of cocoa products and the presence of prominent players in the industry, which contribute to creating many growth opportunities.

Europe also plays an essential role in the global cocoa bean market. Due to many years of cocoa and chocolate consumption habits, plus new recommendations on the health benefits of cocoa products, this market area has a favorable environment for market expansion and investment.

Although the market is becoming increasingly competitive, the increasing consumption of cocoa products for health reasons (good for the heart, supporting weight loss if butter and sugar are not added) helps the industry continue attracting new investments, promoting innovation, and creating the potential for further growth. A more dynamic business

environment after 2023 will push stakeholders to take advantage of emerging opportunities and contribute to industry growth.

Data published by the world's leading cocoa associations for the second quarter of the 2022/23 crop year shows an overall increase in the leading cocoa-consuming markets. In fact, except for North America, where consumption is decreasing slightly, consumption in Europe and Southeast Asia is still increasing.

ECA's data for the first half of the 2022/2023 crop year shows that European cocoa processing reached 734,952 tons, a slight increase of 0.59% over the same period last year. In the first six months of the 2022/23 crop year (October 2022 to March 2023), net trade of semi-finished cocoa from the EU amounted to 33,644 tons, down from 100,952 tons seen in the same period last season. In addition, net imports of cocoa beans into the EU in Q4/2022-Q1/2023 increased by 22% over the same period to 641,539 tons.

In North America, NCA reported cocoa processing output in the first half of the 2022/2023 crop year fell 6.27% year-on-year to 216,796 tons compared to 231,308 tons recorded in the first half of the crop year 2021/2022. Additionally, based on trade data on semi-finished cocoa from both Canada and the United States, it can be seen that in the first half of the 2022/23 cocoa season, both countries imported 317,651 tons of semi-finished cocoa, an increase of 17 % compared to the 270,753 tons of semi-finished cocoa imported during the corresponding period of the 2021/22 crop year.

During the same period, net imports of cocoa beans into the United States and Canada reached 241,109 tons, an increase of 15.60% over the same period last year. The increase in net cocoa bean imports into North America is reflected in cocoa bean stocks, which are currently high in Exchange-monitored warehouses in the region.

An increase in imports of cocoa semi-finished products offset reduced domestic cocoa bean processing in the two North American markets. In general, both countries are currently the largest net importers of semi-finished cocoa products in the world.

In Southeast Asia, the CAA released data showing that Q1/2023 cocoa processing activities in the region improved year-on-year, increasing by 4.09% from 213,313 tons in Q1/2022 to 222,028 tons in Q1/2023.

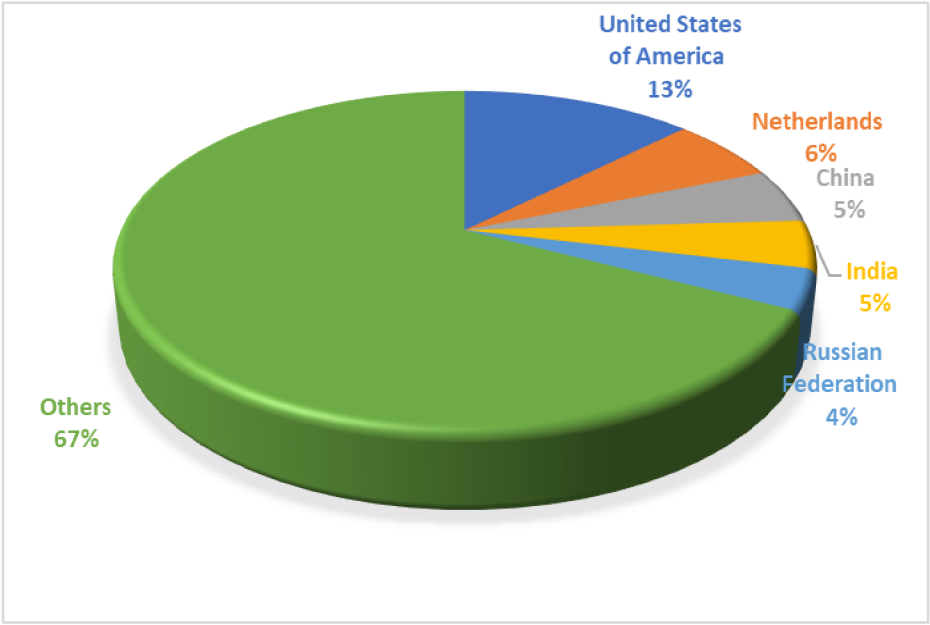
- **Cocoa bean import market**

Table 5. The world's leading group of cocoa powder importers with code HS 1805 in the period 2018-2022 (in terms of value) (thousand USD)

	2018	2019	2020	2021	2022
United States of America	266842	280967	273436	330181	411848
Netherlands	159414	152.24	155792	159055	198266
China	102.22	92999	101316	143076	166072
India	49809	52993	58117	92.92	146916
Russian Federation	109991	107772	109544	137248	124575
Others	1.819.545	1.836.456	1.818.912	2.220.859	2.176.904

(Source: Own processing based on data of ITC)

Figure 7. Structure of the cocoa powder import market in the world in terms of value in 2022 (%)



(Source: Own processing based on data of ITC)

Among countries in the world, the United States is the largest cocoa powder import market. According to recent statistics, in 2022, the United States spent nearly 4.1 billion USD to import cocoa powder. This figure is equivalent to 13% of the total value of cocoa powder imports worldwide. The vast scale of US imports reflects the massive demand for cocoa powder from the food and pharmaceutical industries in this country.

Specifically, cocoa powder is widely used as a raw material for producing chocolate, candy, yogurt, and breakfast cereals. In addition, cocoa powder is also extracted to make medicine or functional foods, thanks to its many health-beneficial nutrients. With the trend of healthy eating becoming increasingly popular in the United States, the demand for imported cocoa powder is forecast to increase in the future.

After the United States, the Netherlands and China are the two largest cocoa powder import markets, with values reaching 6% and 5% of total global turnover, respectively. Although heavily influenced by Western sanctions, Russia remains a significant cocoa powder consumer market, ranking fifth globally with 4% of global import value.

4.2 Overview of Vietnamese cocoa

4.2.1 Origin of the Vietnamese cocoa tree

The cocoa tree belongs to the genus Theobroma cacao L. and the family Malvaceae. Theobroma includes more than 20 species, of which only Theobroma cacao is widely grown, while the other species are either wild or rarely grown.

Theobroma cacao is the only species with commercial value, and it is divided into two subspecies, Criollo and Forastero, in addition to another species, Trinitario, which is the result of crossbreeding between Criollo and Forastero species. The Spaniards named Criollo (indigenous) after the cocoa tree was first planted in Venezuela. The Forastero group is the common cocoa variety of Brazil and West Africa, which are naturally dispersed in the Amazon River valley. The Trinitario group is a hybrid of the above two breeds that first appeared on the island of Trinidad, a Spanish colony, in the 18th century.

Maya farmers were the first to grow cocoa in Central America, mainly in Mexico. The history of the Astèque people confirms that, since the 14th century, cocoa trees have been grown in Mexico. Here, planting and harvesting occur on occasions when religious ceremonies are held. It was only in the 19th century that cocoa farming made significant progress, giving the chocolate industry a basis to develop in Europe. In the Americas, two new cocoa-producing countries have appeared: Ecuador and Brazil. In Africa, cocoa trees are only grown on the islands of the Gulf of Guinea.

During the 20th century, cocoa production grew enormously because of the extremely rapid expansion of cocoa-growing areas in Africa. During the period 1945 - 1985, the five cocoa "powerhouses" were Brazil (19%), Cameroon (6%), Ghana (11%), Ivory Coast (30%) and Nigeria (6%). From 1985 onwards, Asian countries began vigorously developing cocoa, first in Malaysia, Indonesia, India, Sri Lanka, etc. In Vietnam, cocoa trees followed the French to

the South. In the early 19th century, cocoa trees were not grown on a plantation scale like rubber trees. Because rubber is indispensable to the French industry, cocoa beans are not. Around 1994, a state project to grow cocoa with a scale of 10,000 hectares was implemented, mainly in Quang Ngai, but failed for many reasons. The desire to grow cocoa trees similar to coffee trees failed. The state's cocoa seed research program began in 2000. By 2002, the Success Alliance organization had a project to develop cocoa trees, starting with Ben Tre province and then other provinces such as Tien Giang, Binh Phuoc, Ria Vung Tau, and Daklak. To date, 01 sets of cocoa varieties, including eight commercial lines, has been recognized for breeding for production. The future of cocoa trees in the Mekong Delta, Southeast, and Central Highlands is auspicious. From a country not famous for producing cocoa beans, Vietnam can step up to become a power of exporting cocoa beans worldwide, as has been successful with Robusta coffee.

4.2.2 Characteristics of cocoa tree

Cocoa is a small tree that can grow up to 10 - 20 m tall if it grows naturally in the forest. In production, due to high-density planting and growth control through pruning, the tree usually has an average height of about 5-7 m and a trunk diameter of 10-18 cm. Cocoa grows well under shade so that it can be intercropped with several other economic crops. The period of effective business can last from 25 to 40 years.

Cocoa flowers are small, about 10 - 15 mm in diameter, with five petals blooming in small clusters on old wood, on the trunk, and also on branches or on branches where the leaves have fallen. Flower buds begin to bloom in the afternoon and fully bloom the following day. Only a tiny fraction of the blooms will set fruit, with the primary pollinators being small Ceratopogonidae flies.

The development time of the fruit from fruit set to maturity is usually about 5-6 months. In addition, young pods formed on cocoa trees do not fully ripen, but large numbers often wither and fall off the tree.

Cocoa pods are 10 - 30 cm long and 7 - 9 cm in diameter. The fruit can weigh from 200 - 1000 g. Depending on the species, the shape of the fruit varies widely from spherical, long and pointed, ovoid or tubular. The color of the fruit is quite diverse; there are green, yellow, and red fruits.

The characteristic of cocoa beans is that when ripe, the shell does not burst open and rarely falls off the tree. Each cocoa pot usually contains 30 - 40 beans surrounded by a mucus layer.

This mucus layer has a slightly sweet taste and is the substrate for the fermentation process when fermenting the seeds later.

4.2.3 Development stages of Vietnam's cocoa industry

The first cocoa-growing trend in Vietnam started before the country was unified. Cocoa was first brought to South Vietnam by the French (before 1954) and the Americans (before 1975), but due to war restrictions and instability in agricultural production areas, the commercial potential of this nascent industry could not be exploited. During that period, cocoa trees were less profitable than coffee, pepper, and cashews, so most were cut down.

The second trend was in the 1980s. During the 1980s, the Vietnamese Government tried to develop cocoa trees in state-owned farms. This effort has formed cocoa-growing areas spanning many provinces, from Quang Ngai to Can Tho, with the participation of thousands of farmers. In Quang Ngai, the cocoa area has reached 3,000 hectares. Although farmers have succeeded in growing cocoa and harvesting, state-owned enterprises must build a consumption system. Because there are no domestic buyers and cannot export, most farmers have switched to other crops. This failure makes people and authorities skeptical about the economic feasibility of cocoa in Vietnam.

The third trend was in the 1990s. From mid-1990 to 2000 was the research and testing period. The World Cocoa Federation (WCF) has supported the Ho Chi Minh City University of Agriculture and Forestry. Ho Chi Minh City to establish a Cocoa Demonstration Center and conduct trials on varieties and productivity. During this period, there was also the participation of the Central Highlands Institute of Agricultural and Forestry Science, Can Tho University, Danish International Development Agency (DANIDA), and German International Development Agency (GTZ)

From 2001 to 2012, it was a period of growth in scale. During this period, there were many projects funding cocoa development in Vietnam, such as SUCCESS Alliance (SUCCESS Alliance: Project "Developing sustainable cocoa production for farmer households in Vietnam" by the Ministry of Agriculture and Rural Development in coordination with the organization), ACDI/VOC - an American non-governmental organization implemented in the Mekong Delta, Southeast and Central Highlands (2004-2007, 2008-2014), project PSOM (Dutch et al. for Integrated Markets funded by the Dutch Government) funded by the Dutch Government (2004-2006), Helvetes organization (Swiss Association for Cooperation international cooperation) of Switzerland implements UTZ Certified standards (Global et al.) for cocoa products. In coordination with non-governmental and private organizations,

the Government of Vietnam plays an important role in directing the development strategy of the Cocoa Industry.

By 2012, the Ministry of Agriculture and Rural Development issued a Decision approving cocoa development planning in the southern provinces up to 2015 and orientation to 2020. From 2013 until now, there has been a period of decline in scale. During this period, there are almost no more sponsored projects to distribute seedlings to farmers for two reasons: there is no funding, or there is funding, but it cannot be deployed due to low demand for planting.

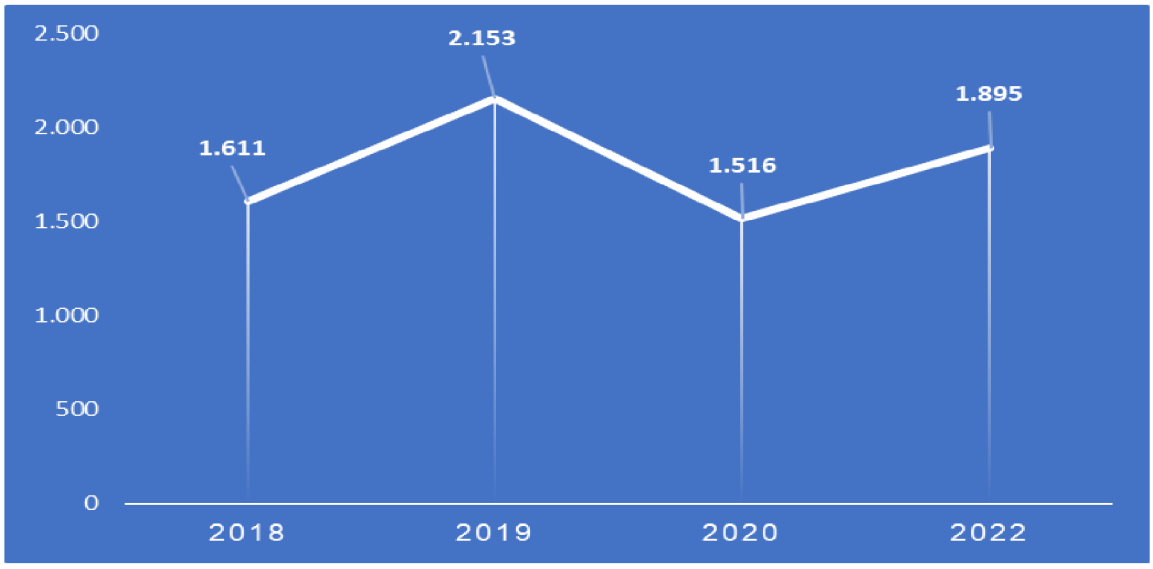
Through the above analysis stages, Vietnam's cocoa industry is mainly built by projects from non-governmental organizations and poverty reduction projects. Moreover, when the funding of these projects no longer exists, the scale of the whole country also decreases.

Currently, in Vietnam, there are three leading cocoa-growing regions: the Mekong Delta, the Central Highlands, and the Southeast region. Cocoa is mainly intercropped (with coconut, cashew, and fruit trees) rather than specialized cultivation in major exporting countries (Cote d'Ivoire, Ghana, Indonesia). In the Mekong Delta, cocoa is mainly grown in Tien Giang, Ben Tre, Hau Giang, Vinh Long, Tra Vinh, and Soc Trang. In the Central Highlands, cocoa is grown in Dak Lak, Dak Nong, and Lam Dong. In the Southeast region, cocoa is grown mainly in Binh Phuoc, Dong Nai, and Ba Ria-Vung Tau.

4.2.4 The current situation of Vietnamese cocoa exporting

4.2.4.1 The current situation of cocoa bean exporting

Figure 8. Vietnam's cocoa exports by output (thousand USD)



(Source: Own processing based on data of ITC)

According to ITC's statistics from 2018 to 2022, Vietnam's cocoa bean export activities had growth in the early stages but faced many difficulties due to the impact of the COVID-19 epidemic.

Specifically, in 2018, Vietnam exported 1,611 tons of cocoa beans. This number increased significantly in 2019, reaching 2,153 tons, corresponding to an impressive growth of 33.6% compared to the previous year. The breakthrough in the amount of cocoa beans exported shows that Vietnam's cocoa industry is gradually asserting its position and reputation in the world market. Cocoa export enterprises have actively expanded markets and promoted products. However, due to the negative impact of the COVID-19 pandemic, Vietnam's cocoa bean export activities were seriously affected. Export output decreased by 29.5% compared to 2019, reaching only 1,516 tons in 2020. Travel restrictions and social distancing measures make international trade encounter many obstacles in exporting goods and cocoa beans.

The situation shows signs of recovery in 2022 when Vietnam exports 1,895 tons of cocoa beans, an increase of 25% compared to 2020. However, this number is still lower than the peak of 2,153 tons in 2019. It shows that Vietnam's cocoa industry is recovering but still slow and cannot overcome the "shock" caused by the pandemic.

According to statistics from the International Trade Center (ITC), Vietnam's cocoa bean exports currently rank 25th in the world in terms of output, reaching about 1,895 tons.

Compared to other Asian countries, Vietnam's cocoa export output is much lower. For example, in 2020, Indonesia exported 210,634 tons of cocoa, Malaysia reached 95,556 tons, while Vietnam's figure was only 1,516 tons, dozens of times lower. Vietnam's cocoa export output is even lower than that of some smaller countries in the region, such as the Philippines, Solomon, and Papua New Guinea.

Table 6. Top 25 countries with the world's most enormous cocoa bean export output (HS code 1801) and Vietnam's ranking (tons)

No	Market	**2018**	**2019**	**2020**	**2021**	**2022**
	The world	3,975,293	10,081,434	10,020,768	8,177,795	**No Quantity**
1	Ivory Coast	1,525,594	1,621,749	1,486,051	1,609,684	**1,473,363**
2	Nigeria	148,419	166,569	127,612	365,802	**512,297**
3	Ecuador	296,776	270,944	323,399	329,784	**391,727**
4	Belgium	212,184	196,160	224,098	211,349	**224,505**

5	Netherland	161,401	167,930	74,218	155,917	**160,324**
6	Malaysia	155,572	110,892	95,556	104,461	**108,423**
7	Dominica	73,890	67,853	64,685	70,704	**74,426**
8	Peru	60,101	58,607	53,685	57,625	**64,640**
9	Guinea	7,884	13,875	18,936	31,079	**37,027**
10	Congo	28,401	40,037	47,508	47,346	**29,865**
11	Indonesia	27,827	30,835	210,634	22,280	**24,603**
12	Sierra Leone	11,428	15,867	20,798	17,261	**16,591**
13	Estonia	29,403	11,647	13,610	18,305	**16,398**
14	Madagascar	9,666	13,660	12,434	14,783	**14,814**
15	Venezuela	11,102	18,131	11,346	12,882	**12,108**
16	Togo	6,476	5,686	9,127	6,763	**11,000**
17	Germany	9,940	12,530	12,249	12,827	**8,023**
18	Nicaragua	4,013	4,698	6,047	7,496	**7,810**
19	Colombia	7,056	9,116	11,148	11,660	**6,044**
20	USA	6,479	8,917	11,212	8,556	**4,559**
21	Sao Tome & Principe	3,045	2,731	2,331	4,054	**3,180**
22	Solomon Islands	5,048	4,006	3,459	3,500	**2,867**
23	Philippines	3,182	3,096	5,250	4,487	**2,829**
24	Canada	8,970	10,510	843	392	**2,445**
25	**Vietnam**	**1,611**	**2,153**	**1,516**	**No Quantity**	**1,895**

(Source: Own processing based on ITC data)

4.2.4.2 The current situation of cocoa powder exporting

Table 7. Export value of cocoa powder code HS1805 and chocolate code HS1860 of Vietnam over the years 2018-2022 (thousands USD)

Types	2018	2019	2020	2021	2022
Code HS1805 : Pure cocoa powder	160	286	507	207	
Code HS1806: Chocolate and other food preparations containing cocoa	16,693	183,60	15,188	20,309	33,611

(Source: Own processing based on ITC data)

Vietnam's export scale is still microscopic for pure cocoa powder (code HS1805). According to additional information, Vietnam's cocoa powder export output is only about 100-200 tons/year, equivalent to about 0.008% of the total global cocoa powder export volume. With such modest output, Vietnam ranks about 90th globally in exporting this product. The export value is only at a shallow level of a few hundred thousand USD.

It shows that Vietnam's cocoa product processing industry is still fragile. Cocoa powder exports are almost insignificant, not comparable to leading countries such as the Netherlands, Belgium, and Germany. To develop this product, Vietnam must invest heavily in technology and improve production capacity to increase the output and quality of cocoa powder, meeting export standards.

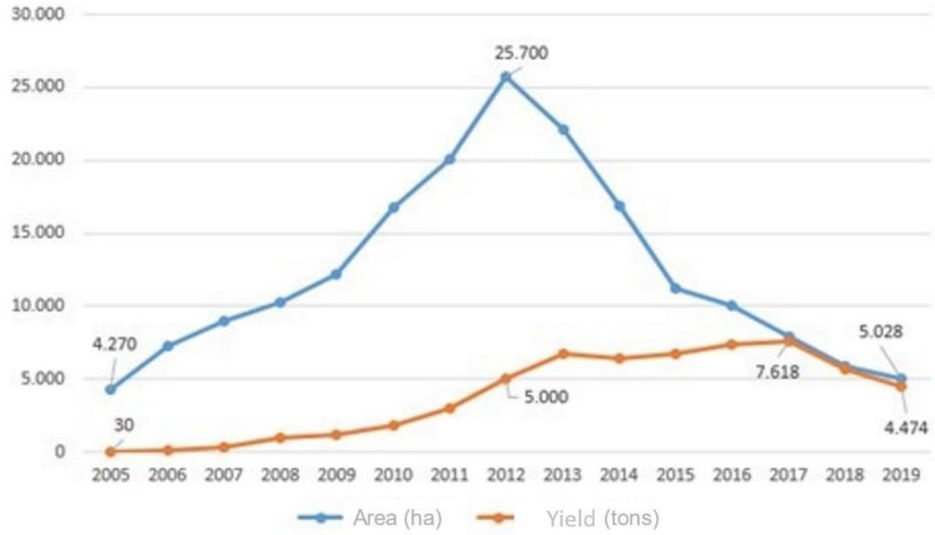
In contrast, with chocolate and cocoa products (code HS1806), Vietnam's exports have made significant progress. Export value increases gradually over the years, from 16.7 million USD in 2018 to 33.6 million USD in 2022, an average growth rate of about 20%/year. However, the scale of Vietnam's chocolate exports is still modest, accounting for only about 0.2% of the global market share.

In general, Vietnam's cocoa processing industry is only in the initial stages of development. Cocoa powder exports are almost insignificant, while chocolate exports are also modest. To become a potential cocoa exporting country, Vietnam needs to make efforts to improve its production, processing, and marketing capacity.

4.2.5 The current situation of cocoa production and processing activities in Vietnam

4.2.5.1 Cocoa production activities (cocoa planting situation)

Figure 9. Area and annual output of cocoa beans in Vietnam



(Source: Department of Crop Production, 2019)

As a newly developed country in the global cocoa industry, Vietnam produces a very modest annual output of cocoa beans, about 5,500 tons, while the world's output is about 4.8 million tons (Department of Crop Production, 2019). However, in the international market, cocoa beans from Vietnam have been recognized as having good fermentation quality thanks to early attention to planning and development from the public and private sectors and due to Vietnam's typical climate.

Besides, Vietnam is still in the early stages of development with a very modest cocoa output. According to 2019 statistics, Vietnam's cocoa output only reached about 5,500 tons/year. This number must exceed the annual global cocoa output of up to 4.8 million tons. The proportion of Vietnam's cocoa output is only about 0.1% compared to the world.

However, although output is still low, Vietnam's cocoa quality is highly appreciated in the international market. Specifically, Vietnamese cocoa beans have good fermentation ability, suitable for processing into high-end products. It is thanks to the early interest in investment, research, and development of the cocoa industry from both the domestic public and private sectors. Besides, Vietnam's humid tropical climate is also very suitable for growing cocoa trees.

Regarding area, according to 2019 statistics of the Vietnam Cocoa Development Coordinating Board, the highest cocoa area was 25,700 hectares in 2012, but then decreased continuously. By 2019, the country's cocoa area was only 5,028 hectares, down more than

80% compared to the peak. Some localities with a sharp decrease in area include Ben Tre, Dak Lak, and Binh Phuoc. It is because cocoa prices fluctuated strongly on the world market after 2012, making growers uneasy about investing. On the other hand, some localities choose land unsuitable for growing cocoa so that productivity could be higher and more effective. Limitations in farming and care techniques and lack of support from specialized agencies also cause farmers many difficulties. Besides, the State's policies to support and encourage cocoa development still have many shortcomings and must be more effective. Some climate change issues also negatively affect cocoa-growing areas.

Regarding certified production: According to data from UTZ Certified, certified cocoa production in Vietnam has increased rapidly since 2011, reaching the highest level in 2014 with 16 participating production units, with 3,323 households, 2,822 hectares, and an output of 2,654 tons of grain. During this period, most of the costs were supported by UTZ Certified organizations, Helvetia's Vietnam, etc. However, after 2014, when support from organizations decreased, certified production also decreased. By December 2017, there were 2 certified production units with 286 households, 285 hectares and an output of 330.3 tons in the provinces of Dak Lak, Dak Nong, Ba Ria - Vung Tau, Dong Nai, and Ben Tre. The reason is said to be due to the strong development of pests and diseases on cocoa trees, leading to large production costs and causing losses to producers. The competitiveness of cocoa trees is not superior to some other strong crops due to low productivity, not outstanding economic efficiency, and an unstable market; the low national cocoa output makes foreign traders hesitant to invest (Department of Crop Production, 2019).

Besides, Vietnam's cocoa output only reaches about 4,500 - 5,000 tons/year, equivalent to 0.1% of global output. The causes of low cocoa output are due to the following factors:

• First, most of the cocoa area is planted alternately, spontaneously, and without planning. Therefore, applying science and technology to improve productivity is very difficult.

• Second, farmer households lack knowledge, experience, and skills in growing cocoa. They lack support in cultivation, care, and harvesting techniques.

• Third, most of the cocoa varieties grown are salvaged varieties and have not been carefully selectively bred, so productivity and quality are low.

• Fourth, the initial investment costs for new planting and care of cocoa are still high, so many households are not interested.

• Fifth, policies supporting and encouraging cocoa development are not practical.

However, despite the sharp decrease in area, Vietnam's cocoa output has increased steadily. Figure 9 shows that although the cocoa cultivation area has decreased sharply since 2012, overall output has increased steadily over the following years, reaching the highest in 2017 with 7,618 tons of dry beans. It shows that farmers' cocoa productivity is increasing and improving more than before, thanks to more advanced farming techniques.

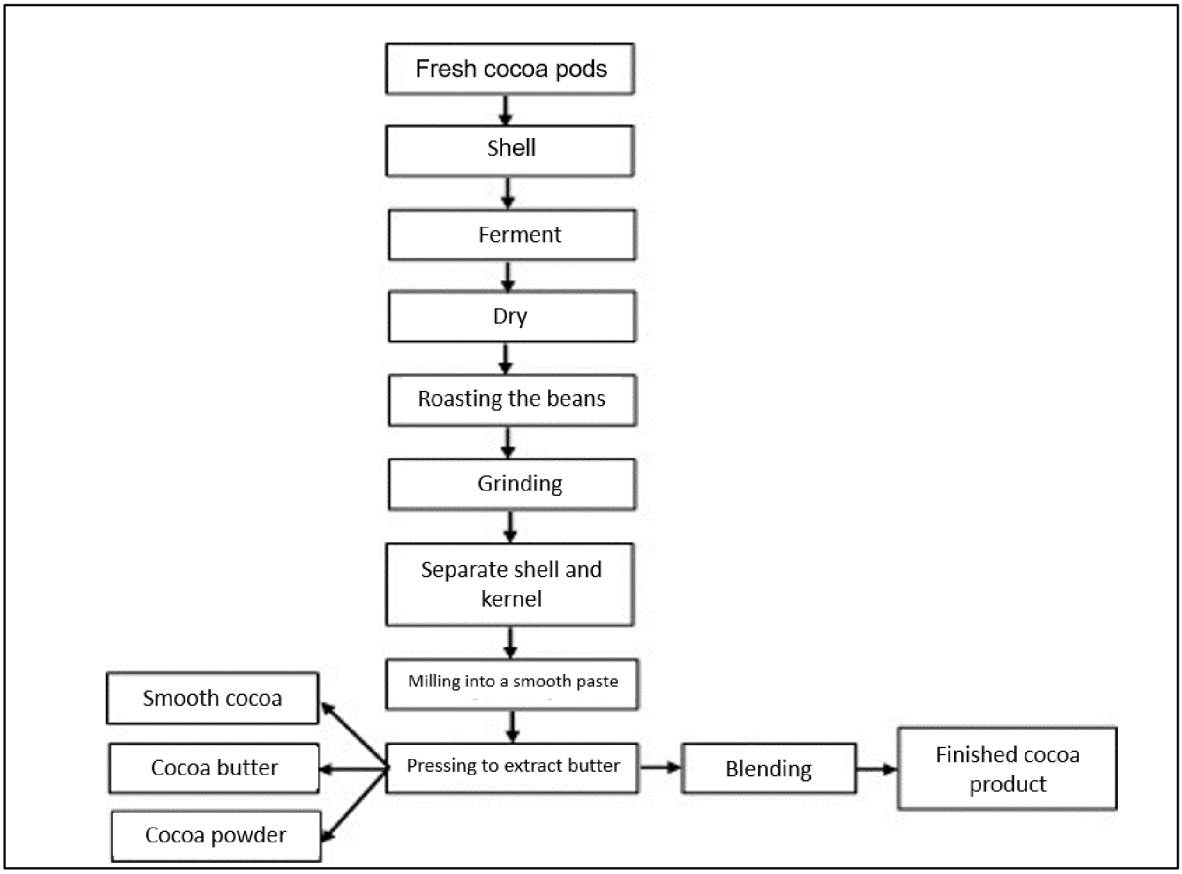
4.2.5.2 Cocoa processing activities

In cocoa growing areas, farmers, purchasing households, or small production units often undertake the preliminary processing and fermentation of beans. However, the current trend is moving towards more centralization, with several large enterprises, such as Puratos Grand Place Company, Trong Duc Cocoa Company Limited, and many other large production units, carrying out purchasing cocoa fruits or wet cocoa beans to conduct preliminary processing and fermentation at large processing plants. However, some cocoa processing and fermentation systems are inevitably facing challenges, mainly due to raw material shortages, causing a decline in the scale of their operations.

In addition to the preliminary processing and fermentation stages, the cocoa bean process includes a series of steps to process cocoa products into semi-finished or finished products. Many small businesses focus on processing cocoa beans into semi-finished or finished products such as paste, cocoa powder, cocoa butter, confectionery, chocolate bars, cocoa liquor, etc. These products are mainly supplied to the food manufacturing industry and meet domestic consumer demand, forming an indispensable part of the value chain of the food and beverage industry in general.

However, the cocoa bean processing process still needs to improve in scale and technology. Some small businesses need help optimizing production processes and maximizing resources. Meanwhile, large enterprises face pressure from fierce competition, requiring them to constantly innovate and enhance production efficiency to meet the increasing market demands. All these challenges motivate the cocoa industry to continue its best efforts while opening new development opportunities in the future.

Scheme 3. The production process of chocolate products



(Source: Bui, 2020)

Vietnam currently ranks 23rd on the list of countries with good-tasting cocoa products, becoming the second Asian country to achieve this title after Indonesia, but up to 40% of cocoa production is recognized, while Indonesia only has a rate of 1% (Sonia Gregor, 2017). Besides the soil factor, this difference also comes from the natural fermentation method to create uniqueness. It is the process of fermenting cocoa, roasting, and grinding beans to bring out the characteristic fruity flavor inherent in Vietnamese cocoa beans.

With detailed and strictly documented instructions on the bean preparation and fermentation process, Vietnamese cocoa beans have quickly entered the international spotlight. Producing excellent chocolate products from the Marou brand, using cocoa beans grown in the Mekong Delta, has helped boost Vietnam's reputation on the world map. The New York Times has highly appreciated this chocolate product with significant influence, described as "The world's finest chocolate bar". These successes have opened the door for Vietnamese cocoa beans, as the demand for quality cocoa beans from this country is increasing enormously in the international market.

Not only stopping planting and harvesting, but many companies have also focused on investing and developing processing plants with advanced technology. Trong Duc Cocoa Company, Kimmy Company, and Binon Cocoa are some typical examples of significant investments in this field through the introduction of advanced technologies, investment in developing eco-tourism areas with cocoa experience, and contribution to promoting tourism and the local economy.

In 2009, Puratos Grand-Place company made a significant breakthrough by testing and building a Sustainable Cocoa Sourcing Strategy called "Cocoa-Trace" in Vietnam. This model has achieved success in this country and has been expanded and applied globally. Cocoa products produced in Vietnam under this model have achieved recognition from the international community with excellent cocoa awards and certificates of superior taste in 2015 as clear proof of the innovation and creative spirit of the Vietnamese cocoa industry.

Since 2020, the cooperative has purchased well-developed cocoa gardens, produced organically, and selected large, beautiful fresh fruits to separate the fruits to get seeds to juice. This amount of water will be boiled with a small amount of sugar, cooled, mixed with sweet yeast (made from soybeans), and incubated to ferment into wine. On average, 10 kg of fruit will extract and ferment 2 liters of cocoa liquor. After fermentation, cocoa water will turn from white to amber, clear and fragrant. Fermented cocoa, which is incubated for one year, can be used, and the longer it is left, the more delicious, the richer the taste, and the higher the purity.

Cocoa wine is made from fresh fruit, so during the main harvest between May and November every year, the cooperative will quickly collect juice and ferment it to serve customer needs. In 2022, the cooperative sold 3,000 liters of fermented cocoa for 100,000 VND/liter, earning a significant profit.

In 2023, the cooperative will invest in machinery to focus on developing chocolate products, upgrade Thai Dang pure cocoa powder, and complete the registration process to participate in the One Commune One Product (OCOP) Program for 3-in-1 chocolate and cocoa powder products, step by step affirming quality, competitiveness in the market, and getting more opportunities to access the domestic and foreign markets.

4.2.6 The current situation of factors affecting Vietnam's cocoa export capacity

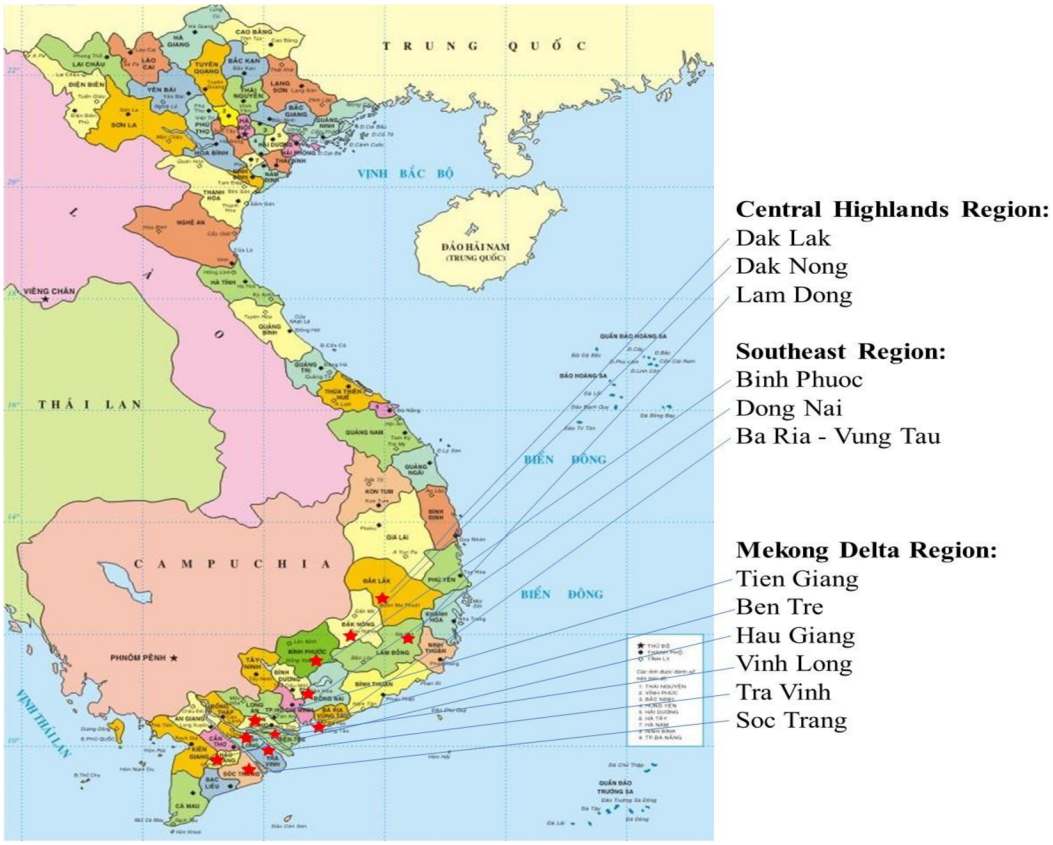
4.2.6.1 The factors affecting the cocoa supply

Conditions for input factors related to cocoa development in Vietnam include natural conditions and natural resources such as (geographic location, weather climate, terrain, land

resources, water resources, sun and wind regimes), human resources, capital resources, technical infrastructure systems serving production such as (road traffic, waterway traffic, seaport system, air transportation, power supply system, irrigation system, water supply, and drainage system, information system); institutions such as the Center for Research and Transfer of Science and Technology, training establishments and vocational schools.

- **Natural conditions and natural resources**

Figure 10. The location of plantation in Vietnam



(Source: Own processing based on the map of Dong Thap Educational Resources Library, 2023)

With its geographical location in the tropical monsoon region, Vietnam is enriched by unique and diverse natural elements, creating an ideal environment for cocoa growing. With a hot, humid, rainy climate, this country perfectly meets the temperature needs of cocoa trees, with an average temperature of 25-27 degrees Celsius and an average rainfall of 1,500-2,500 mm/year. These natural conditions create an ideal growing environment and ensure high and stable productivity during the growing process.

Vietnam's diverse terrain, with mountains, plateaus, and a 3,260 km long coastline, opens up many opportunities and advantages for growing cocoa. The cocoa tree, a shade-loving tree,

is suitable for cool climates, avoids the direct impact of sunlight, and grows well in mountainous terrain, plateaus, and other similar climate zones. In particular, the Central Highlands region, with its high terrain, fertile soil, and cool climate, has demonstrated its suitability and great potential for cocoa growing, with cocoa growing areas in the Central Highlands estimated at 100,000 hectares, concentrated mainly in the provinces of Dak Lak, Dak Nong, Lam Dong, Gia Lai, and Kon Tum. In addition to the Central Highlands, the Southeast region is known for its relatively flat terrain, hot and humid climate, and sufficient rainfall, creating favorable conditions for cocoa growing. With a cocoa growing area in the Southeast region of about 50,000 hectares, mainly concentrated in Binh Phuoc, Dong Nai, and Ba Ria-Vung Tau provinces, this area contributes significantly to the country's cocoa output. Similarly, with its low mountainous terrain, hot and humid climate, and steady rainfall, the South-Central region creates ideal conditions for cocoa growing. With a cocoa growing area in the South-Central region of about 20,000 hectares, mainly concentrated in the provinces of Khanh Hoa, Phu Yen, Binh Dinh, Quang Nam, and Quang Ngai, this area has demonstrated strong potential for development of the country's cocoa industry.

The climate in Vietnam has tropical monsoon characteristics, with two distinct seasons: the rainy and dry seasons. With a rainy season lasting from May to November and a dry season from December to April, Vietnam creates an ideal environment for cocoa trees to grow and develop all year round, ensuring stable and regular yields.

Vietnam is also known for its diverse and rich land resources, with many types of soil, such as basalt red soil, yellow-red soil, and gray soil, creating ideal conditions for growing cocoa with basalt red soil areas, yellow-red soil, and gray soil in Vietnam are about 6.2 million hectares, 2.3 million hectares and 1.5 million hectares respectively.

Vietnam's water resources are abundant, with many river systems, ponds, and lakes providing enough water for cocoa trees to grow and develop. Cocoa trees are moisture-loving plants and need to be provided with enough water. Vietnam's abundant water resources meet the water needs for cocoa trees to grow and develop. Vietnam's river network is quite dense, with a total length of about 41,000 km. The big rivers in Vietnam, such as the Red River, Da River, and Mekong River, can all provide water for cocoa plants. Vietnam has many large water reservoirs, with a total capacity of about 100 billion m3. These reservoirs can provide irrigation water for cocoa trees during the dry season.

With such favorable natural conditions and natural resources, Vietnam has many suitable cocoa-growing regions, such as the Central Highlands, Southeast, and South Central. These

regions have climate, Suitable weather, and natural resources that help cocoa trees grow and develop well, giving high yields and good quality.

- **Labor resource**

The labor structure by industry has recently been assessed through the number of workers working in industry, agriculture, and services. The proportion of labor in agriculture decreased from 62.7% in 2001 to 48.7% in 2010 and 27.6% in 2022, corresponding to a decrease in the number of workers in this industry by -10,369 million people (from 24,469 million in 2001 to 14.1 million workers in 2022) (Financial Magazine, 2023). Labor in the agricultural industry has gradually decreased year by year, but during the COVID-19 pandemic, labor increased from 28.3% in 2020 to 29% in 2021 due to social distancing, so workers returned to their hometowns to find jobs. This increase is only temporary because they will return to the city to work when the epidemic is controlled.

The worrying thing about reducing the proportion of labor in the agricultural sector is that these are often young, healthy, and capable workers, so the remaining labor force in agriculture is already tiny and is tending to "age", which requires the agricultural sector to quickly change the structure of crops and livestock to match the trend of rapidly decreasing and "aging" agricultural labor.

The quality of labor in the agricultural sector in Vietnam is generally low. The proportion of workers with technical and professional qualifications from the primary vocational level or higher in the agricultural sector is only 7.4% for the Southeast region and 2.21% for the Mekong Delta region. Most workers in the agricultural sector still need to be more skilled, straightforward, experienced, and seasonal workers, and there is a shortage of highly skilled workers. Human resources with deep expertise led to a lack of ideas and sufficient ability to organize construction and manage sustainable development. It is considered a problem that needs to be addressed with the province's agricultural sector soon.

- **Capital resource**

The capital sources for investing in farmer households' cocoa gardens are loans and own capital. Regarding loan capital, households mainly borrow capital from the Vietnam Bank for Agriculture and Rural Development according to the credit policy for rural agricultural development (regulations of Decree 55/2015/ND-CP dated June 9th, 2015 of the Government on credit policy to serve agricultural and rural development; Decree No. 116/2018/ND-CP dated September 7th, 2018 of the Government amending and supplementing several articles of Decree No. 55 on credit policy for agricultural and rural

development, Decree No. 41/2010/ND-CP on credit policy for agricultural and rural development). Accordingly, individuals and households engaged in agricultural, forestry, fishery, and salt production can receive unsecured loans with assets up to a maximum of 50 million VND. Also, with loans not secured by assets, households doing business, producing professions, or providing services for agriculture and rural areas are considered for loans up to 200 million VND; Cooperatives and farm owners are considered for loans up to a maximum of 500 million VND.

State budget capital supports through the Agricultural Extension program (Regulated in Article 32 of Decree 83/2018/ND-CP regulating funding sources for agricultural extension activities), supporting training of cocoa farmers and producing first-line varieties for organizations and individuals. In addition, the state budget supports farmers to restore production in cases of natural disasters and epidemics according to Decision No. 142/2009/QD-TTg dated December 31, 2009 of the Prime Minister.

However, despite abundant capital, many people need help accessing state support capital. The bank still has some limitations, such as lending is still spread out, and investment projects have yet to be specifically calculated, so lending is limited. Therefore, the capital source of the Vietnam Bank for Agriculture and Rural Development is relatively abundant. However, farmers in the province need more capital to invest in production. Capital loans to farmers are often small amounts, and management is less complex than for corporate customers, so banks only need to check the process of using capital because farmers only borrow capital mainly to buy goods, supplies, fertilizers, etc. Support policies must be directed directly to farmers, helping farmers proactively invest capital in seeds, seedlings, and means of production.

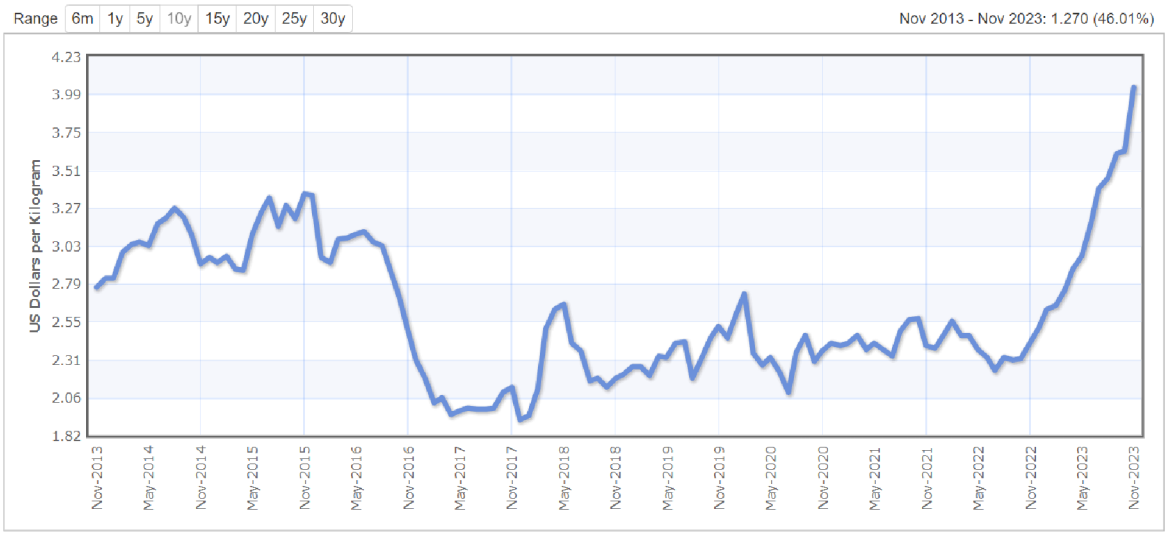
One challenge that makes it difficult for farmers to access capital is the ability to set up production projects and pay debt plans according to bank requirements. Clarifying this issue further, Mr. Le Hong Phuc - Deputy General Director of the Bank for Agriculture and Rural Development (Agribank), said that although Agribank has many credit granting options, it is difficult to lend for agricultural cooperatives because there are many agricultural cooperatives with insufficient capital. In addition, the financial reporting system of cooperatives still needs to be methodical, transparent, and complete. Therefore, in Agribank, the number of agricultural cooperatives with overdue debt due to previous years is still high, affecting credit granting.

A small survey conducted by the author with cocoa-growing households in Tien Giang province showed that 74/85 cocoa farming households have yet to grasp the information about the above Fund sources and have yet to approach for preferential production loans.

- **Cocoa prices in Vietnam and around the world**

Cocoa prices from 2005 until now have fluctuated with an increasing trend. World cocoa prices heavily influence cocoa prices in Vietnam.

Figure 11. The world cocoa prices in 2013 - 2023 (USD/kg)



(Source: Own processing based on ICCO data)

(1USD ≈ 24,000 VND (in September 2023))

Based on ICCO data, from 2005 to 2012, world cocoa prices were stable and gradually increased. According to Department of Crop Production of Vietnam, domestic dried cocoa beans cost 15,000 - 30,000 VND/kg in 2005 - 2006; by 2011, the average price was 70,000 VND/kg (about 7,000 VND/kg for fresh fruit). From 2012 - 2013, cocoa prices decreased sharply, as shown in Figure 11. This price drops greatly affected the production of the cocoa industry in Vietnam.

In 2012, the price of cocoa beans began to decrease to 62,000 - 65,000 VND/kg, and by 2013, it dropped sharply, according to the London floor price, to 54,000 VND/kg (3,000 VND/kg of fresh fruit). During this time, cocoa prices fluctuated and dropped to their lowest, while some crops had much higher economic value and were easier to grow, making farmers impatient to wait. They will cut down cocoa trees to switch to growing fruit trees (green grapefruit, durian, coconut, orange). Furthermore, most farmers grow on a small scale and are scattered, making it difficult to provide technical guidance, causing poor plant growth, many pests and diseases, and low productivity. It makes the farmers not "interested" in cocoa

but switch to other trees. The above reasons led to a sharp decrease in the cocoa growing area in our country from the end of 2012 to 2013. Since 2014, world cocoa prices have begun to recover, leading to a relatively high increase in domestic prices in 2015 (70,000 - 75,000 VND/kg). By 2017, the price decreased slightly to 65,000 - 70,000 VND/kg for dried nuts, the price of fresh fruit was 6,000 VND/kg and is currently on the trend of increasing strongly again in 2023 with an excellent price of 90,000 - 96,000 VND/kg.

Domestic cocoa prices are susceptible to world fluctuations. It will make farmers fearful of sharp price declines because they have limited access to information and lack an understanding of the market. To overcome the current situation, cocoa needs to have a more stable and suitable domestic price compared to the general international price level so that people can feel more secure in production.

- **The infrastructure**

About the road system

According to statistics from the Ministry of Transport, by 2023, Vietnam will have a total road length of 574,448 km, of which asphalt roads are 285,348 km and cement concrete roads are 30,000 km. The national railway system has a total length of 3,144 km, of which double track is 1,644 km. The inland waterway system has a total length of 42,000 km, including 2,300 km of rivers and canals capable of exploiting waterway transport. Vietnam's seaport system has 43 seaports, including ten international seaports (Ministry of Transport, 2023).

However, the rural transportation system in cocoa-growing areas still has many limitations. According to statistics from the Ministry of Agriculture and Rural Development, by 2023, the rate of hardened rural roads in cocoa-growing areas is as follows:

- Central Highlands: 20%
- Southeast: 40%
- South-Central region: 35%

Rural roads in cocoa growing areas are often narrow, muddy, and difficult to navigate, making transporting goods, agricultural materials, and agricultural products difficult. It affects the consumption of cocoa products, reducing product value and farmers' income. For example, in Dak Lak province, which has the largest cocoa-growing area in Vietnam, the rate of hardened rural roads is only about 25%. Rural roads are often narrow, only about 3-4 m wide, of poor quality, and the road surface needs to be more transparent and easier to navigate, especially in the rainy season. It makes transporting goods, agricultural materials,

and agricultural products difficult, affecting the consumption of cocoa products and reducing product value and farmers' income.

However, Vietnam has advantages in transporting and exporting by waterway and sea. Vietnam has a coastline of 3,260 km, with many large seaports, convenient for transporting goods by water. Cocoa growing areas in Vietnam are concentrated mainly in the Central Highlands, Southeast, and South-Central provinces, all of which have rivers, streams, lakes, and lagoons convenient for developing internal waterway transportation and international export.

The electrical system

According to statistics from Vietnam Electricity Group, by 2023, Vietnam's total installed electricity capacity will reach 77,000 MW. The power generation capacity from hydropower sources is 38,000 MW, the power generation capacity from thermal power sources is 32,000 MW, and the power generation capacity from wind power sources is 7,000 MW. All 63 provinces and cities have power transmission grids to ensure local socio-economic development needs (Government Electronic Newspaper, 2023).

However, the proportion of households using electricity regularly and stably in rural, remote, and mountainous areas is still low, only reaching about 80%. On the other hand, electricity supply is also limited in areas with rugged terrain, especially in the Central Highlands, due to a severe shortage of water (hydroelectric reservoirs such as Ialy, Buon Kuop, Buon Tua Srah, Srepok 3, Ba Ha River and many other hydroelectric reservoirs have reached approximately the dead water level), many hydroelectric plants in the Central and Central Highlands have had to operate on a moderate basis for many days, significantly affecting electricity generation in the future. It makes it difficult for irrigation, processing, and preserving agricultural products, affecting cocoa production activities.

- **Government policies and institutions**

Regarding policies at key cocoa growing locations, the State and local authorities regularly update and introduce programs and policies to encourage cocoa production and cultivation. Some examples of policies introduced recently:

- In Vung Tau: Implementing the cooperation program of Ba Ria - Vung Tau province, since 2014 Cargill Vietnam Co., Ltd. and Thanh Dat Cocoa Trading-Service-Production Co., Ltd. have built and put into operation the Center. They are transferring cocoa cultivation techniques to the Chau Duc district. Recently, the Center has done quite well in transferring scientific and technical advances to cocoa

production activities in the province. In addition, Ba Ria-Vung Tau University is currently implementing a project to perfect the chocolate production process. Shortly, the test results were successful for the experimental production of high-quality chocolate. In that case, Ba Ria-Vung Tau University will officially invest in building a factory/production and large-scale cocoa processing company, expected to be in Tan Thanh district, Ba Ria-Vung Tau province.

- In Hanoi, on September 16, 2022, HELVETAS Vietnam and the Center for Community Development (CDC) co-organized the Launching Workshop of the Circular Economy Project in Cocoa Production "From cocoa beans to chocolate bars". The European Union (EU) funded the Project within the framework of the SWITCH Asia program to support Asian countries in their economic transition towards carbon reduction, increasing resource efficiency, and a circular economy with sustainable production and consumption. The project "Circular Economy: From Cocoa Beans to Chocolate Bars" will contribute to accelerating the transition of the cocoa and chocolate industry to circular economy approaches in key developing countries in the product life cycle. Micro, small, and medium enterprises (MSMEs) participating in the Project can improve their brand image, demonstrate their capacity for corporate responsibility towards the environment and society, and, more importantly, meet the requirements of the Project - the market's growing demand for environmentally and socially responsible products.
- In Dak Lak and Lam Dong province: Project implemented by Puratos Grand-Place Vietnam Co., Ltd. from November 2021 to October 2025, implemented by Puratos Grand-Place Vietnam Company (PGPV) and Cooperation Organization German Development – sponsored by GIZ in Vietnam. The project includes five components: Component 1: Project preparation and management; Component 2: Support the development of regenerative agroforestry systems; Component 3: Building technical capacity; Component 4: Strengthening livelihood development and adaptive capacity through diversified income streams; Component 5: Support the development of a community carbon finance framework. The project will reach approximately 300 farmers in Vietnam with 84,000 new plants (shade trees and cocoa trees). The project aims to support small-scale cocoa farmers to improve their capacity to adapt to climate change through diversified income opportunities. The project supports 300 farms to establish agroforestry systems to grow cocoa trees, improve their ability to

adapt to the impacts of climate change and increase net income from many sources by 20%. In addition, farmers can sign contracts to purchase cocoa beans at stable prices with Puratos Grand-Place Vietnam. With the current minimum price, the average additional price based on quality, and the Chocolate bonus program, PGPV is purchasing cocoa at a price about 52% higher than the world market price.

Regarding institutions: Determining the importance of cocoa production and development as an advantage for Vietnam, on April 11, 2005, the Minister of Agriculture and Rural Development issued Decision No. 803/QD-BNN-NN established the Vietnam Cocoa Development Coordination Committee (VCC). With the structure, the National Agricultural Extension Center's director is the VCC Committee's head; VCC members include representatives of state management agencies, scientists, domestic and foreign businesses, non-governmental organizations (NGOs), and cocoa product certification organizations. VCC is currently an official member of the Southeast Asia Cocoa Club (ACC), a specialized cooperation organization within the framework of ASEAN agricultural cooperation. VCC also has relationships with cocoa development organizations in Asia and the World.

However, although the role of the VCC is enormous, the coordination results of the Coordination Committee still need to be better. The headquarters of the permanent agency office is in Hanoi, not directly in the localities, so the activities of Research, application, transfer, and investment projects to support and build production and processing models of organizations and members of the Coordination Committee have not had common cohesion and coordination in recent times.

Consulting and advising the Ministry of Agriculture and Rural Development to promulgate policies to support sustainable cocoa development is still slow and slight. A survey of 85 cocoa farming households in Tien Giang shows that the Coordinating Board and Cocoa Association have not been close to farmers; most households believe that state agencies need to respect their voices, the role of local authorities, the Farmers' Association, including provincial scientific agencies such as Agricultural Extension, Horticulture, and Plant Protection, is not linked with the Coordinating Board to support people leading to confusion among people in focusing resources to develop cocoa gardens and not being able to promptly grasp information about planning, seedlings, price information, and the market. It leads cocoa-growing households to think that cocoa is a side crop to increase income.

- **Quality of cocoa and cocoa products of Vietnam**

The world constantly evaluates Vietnamese cocoa as one of the quality cocoa types with delicious taste and excellent development potential. In recent years, several Vietnamese cocoa products have been recognized for their quality and flavor in the international market, affirming the reputation of Vietnamese cocoa. Some typical examples:

Marou chocolate brand was created by two Frenchmen, Samuel Maruta and Vincent Marou, from cocoa beans grown in Vietnam. Marou produces chocolate through traditional processing to preserve the unique flavor of Vietnamese cocoa. Marou's products won the Gold Award at the Macau International Chocolate and Cocoa Products Fair 2013. In 2018, Marou was voted by Time Magazine as one of Asia's top 25 food brands.

Dak Lak Cocoa Processing Enterprise has successfully produced the G7 Pure Chocolate product. This chocolate product has achieved 3-star OCOP certification at the provincial level. It is highly appreciated for its quality. Pure and delicious cocoa beans grown in Dak Lak create the unique flavor of G7 Simple Chocolate.

Tam Binh Cocoa Company has launched the Mekaho chocolate brand based on high-quality cocoa varieties grown in the Mekong-Mekong Delta. Mekaho Chocolate won first prize in the national Sao Khue Quality Competition 2016. It is also the first Vietnamese unit to join the Asian Cocoa and Chocolate Association (CCA).

Vietnamese cocoa beans are also used as raw materials for high-quality chocolate products that have won international awards from famous brands:

Kitkat Ruby chocolate, produced by Nestle, won the Golden Chocolate award at the 2015 ACSA Chocolate Awards fair.

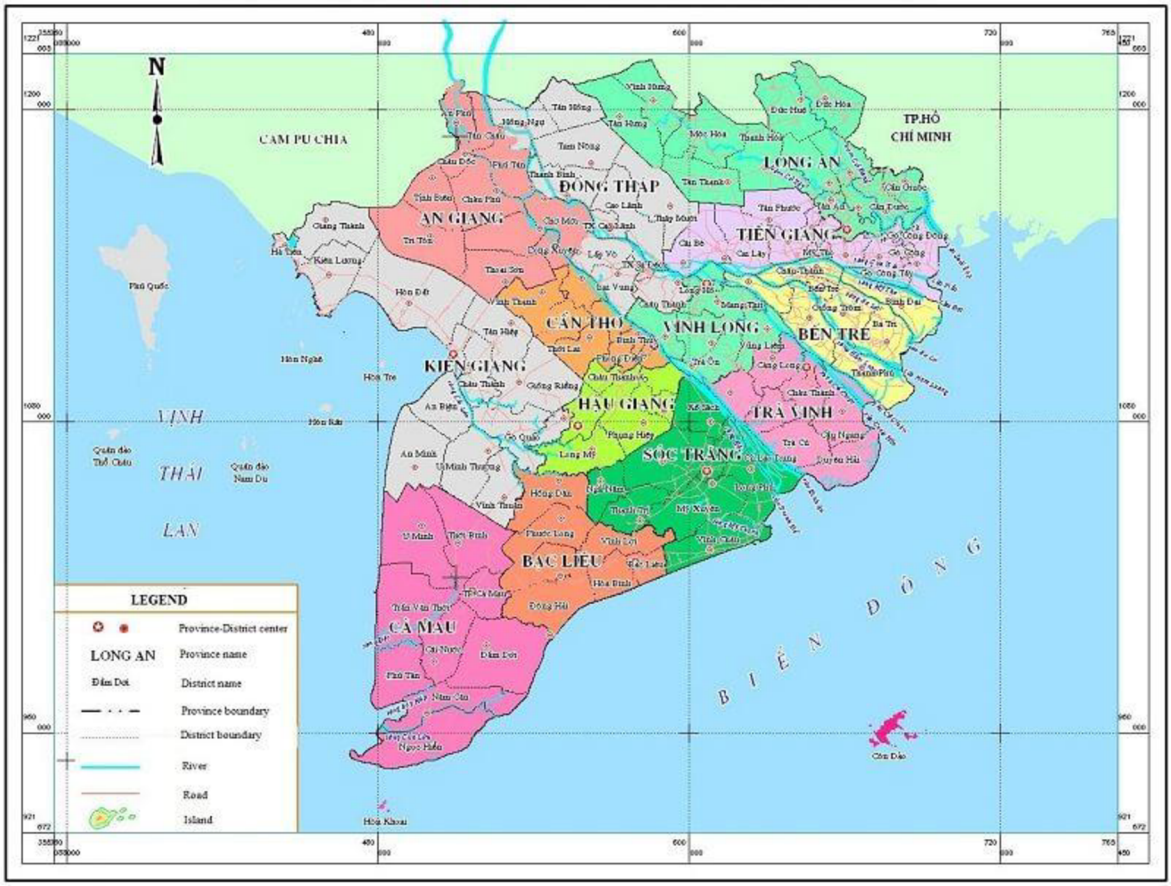
Millot El Cuador chocolate, produced by Bong Sen Group, won the Gold Medal at the Salon du Chocolat (France) in 2016.

Thus, through the above prestigious awards, Vietnamese cocoa beans have proven their quality and unique delicious flavor. From cocoa beans grown on Vietnamese soil, domestic and international manufacturers have created outstanding chocolate and cocoa products, affirming the position of Vietnamese cocoa in the international arena.

5. Result

5.1 Situation of cocoa production in Tien Giang province

Figure 12. Mekong Delta Map



(Source: Administration map)

Tien Giang is a province in the Mekong Delta region of southern Vietnam, a gateway to Ho Chi Minh city (about seventy kilometers far in southwest). Regarding the cocoa production situation in Tien Giang, as of the end of 2019, Tien Giang farmers planted nearly 800 hectares of cocoa, mainly intercropping under coconut trees and other fruit trees, concentrated in the following districts: Cho Gao, Go Cong Tay, Chau Thanh annually achieve a harvest of over 1,000 tons of grain. Cocoa is a new crop, so in recent times, Tien Giang province has had many practical policies to create conditions for widely popularizing techniques and models of cocoa cultivation in coconut gardens for people, such as the transfer of science-intensive farming techniques, expanding the purchasing and consumption network of agricultural products for farmers, building clubs and groups, planting groups and transferring intensive cocoa farming techniques.

Since 2010, the Department of Science and Technology of Tien Giang province has implemented the Organic Cocoa Project with the result that around 600 hectares have been certified to meet UTZ standards. In addition, the province has 41 purchasing points, 31

preliminary processing points, and 40 cocoa fermentation processing facilities, making an essential contribution to solving output for commodity agricultural products.

Tien Giang province currently has over 17,000 hectares of coconut trees, about 75,000 hectares of fruit gardens of all kinds, favorable soil and hydrological conditions for developing and replicating cocoa growing models, increasing income. for farming households, creating jobs for rural workers. However, the province's area, productivity, and cocoa output have recently decreased; Farmers' technical level still needs to be improved. Farmers must pay more attention to cocoa care and intensive farming (Electronic Information Portal of Tien Giang province, 2023).

According to Mr. Cao Van Hoa, Deputy Director of the Department of Agriculture and Rural Development, in response to the above situation, at the same time, in order to promote the potential of land, labor, and diversify crops and livestock in the area and province, is proposing many solutions to develop cocoa trees sustainably, achieving the goal of improving productivity, quality, and output associated with quality. The province focuses on agricultural extension and transfer of intensive cocoa farming techniques, significantly improving growers' productivity and efficiency through good research results, helping farmers apply the proper measures. Cultivation, preliminary processing, and fermentation follow technical procedures (Electronic Information Portal of Tien Giang province, 2023).

5.2 SWOT model analysis of Vietnam's cocoa export capacity

5.2.1 Method for assessing the production and export capacity of Vietnamese cocoa

To evaluate Vietnam's cocoa production and export capacity, the author conducted research and analysis based on various information sources. Specifically, the author has compiled and analyzed secondary data from reports and studies related to Vietnam's cocoa industry's status and development prospects. In addition, the author conducted a field survey of 85 cocoa-producing and processing households in Tien Giang to collect preliminary data on the problematic situation of these households. Finally, the author interviewed more local agricultural extension officers to capture professional perspectives on the current situation and solutions to improve capacity for the Vietnamese cocoa industry.

Information about the survey sample is listed as follows:

Table 8. Description of the survey sample

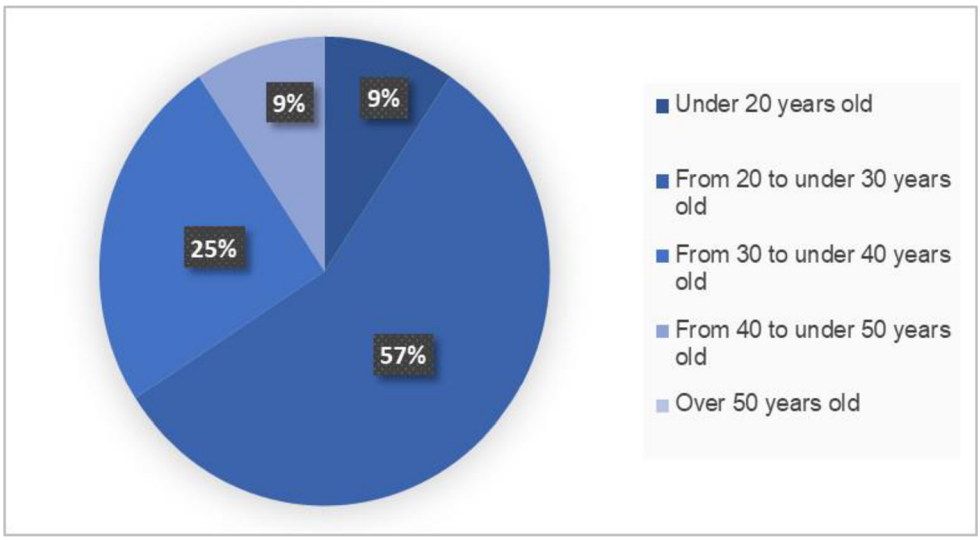
Characteristic	Items	Frequency	Frequency rate (%)
Age	Under 20 years old	8	9,41%
	From 20 to under 30 years old	48	56,47%
	From 30 to under 40 years old	21	24,71%
	From 40 to under 50 years old	8	9,41%
	Over 50 years old	0	0,00%
You are a cocoa grower or processor	I have grown or processed cocoa	16	18,82%
	I'm growing cocoa	12	14,12%
	I am working in cocoa processing	3	3,53%
	I am currently working in growing and processing cocoa	54	63,53%
Number of years of experience working with cocoa	Less than 1 year	6	7,06%
	From 1 to 3 years	16	18,82%
	From 3 to 5 years	26	30,59%
	Over 5 years	37	43,53%
Do you grow cocoa trees intensively or intercropped?	Intensively	2	2,35%
	Intercropped	83	97,65%
Total		85	100,00%

(Source: Own processing based on questionnaire results)

According to survey results of 85 cocoa-producing households in Tien Giang, the age group accounting for the most significant number in the sample is from 20 to under 30 years old, with 48 households accounting for 56% of the total sample. Next is the group from 30 to under 40, with 21 households (25%). The groups under 20 years old and from 40 to under 50 have similar numbers; each group has eight households (9%). Thus, most cocoa growers in the research sample are young, concentrated in working and production age. It shows that cocoa is suitable for a young, dynamic workforce. However, it is also necessary to pay

attention to technical training and transfer of experience to this force of young farmers to improve productivity and product quality.

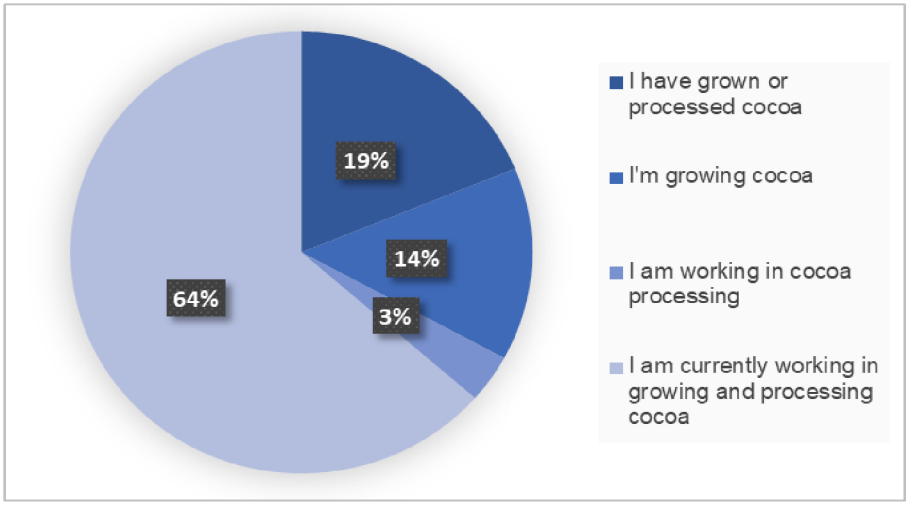
Figure 13. Age of Tien Giang people (%)



(Source: Own processing based on questionnaire results)

Among the 85 cocoa households in Tien Giang, the majority of households both grow and process cocoa, with 54 households accounting for 64% of the total sample, and 12 households are only growing cocoa, accounting for 14%. Three households only process cocoa, accounting for 4%. Sixteen households said they had experience growing or processing cocoa, accounting for 19%. Thus, most people participate in both cocoa growing and processing stages, showing that households often carry out both the growing and initial processing stages for consumption to improve profit rates.

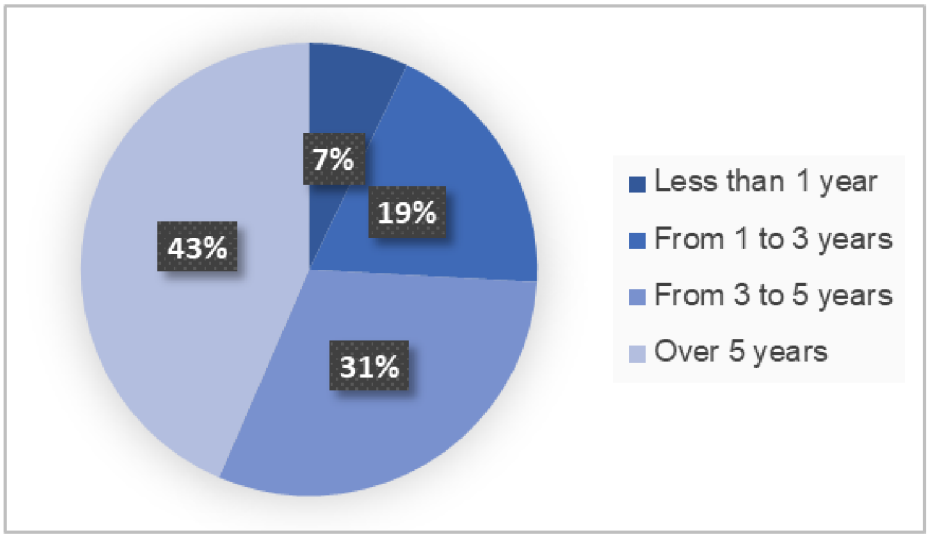
Figure 14. Structure of people participating in the cocoa industry in Tien Giang (%)



(Source: Own processing based on questionnaire results)

Regarding the experience of the cocoa workers, among the 85 cocoa-producing households in Tien Giang, most people have experience working with cocoa trees. Specifically, the group with over five years of experience accounts for the proportion of 37 households, equivalent to 44%. Next is the group with 3-5 years of experience, with 26 households accounting for 31%. The group with 1-3 years of experience is 16 households, accounting for 19%. Finally, the group with less than one year of experience is six households, accounting for 7%.

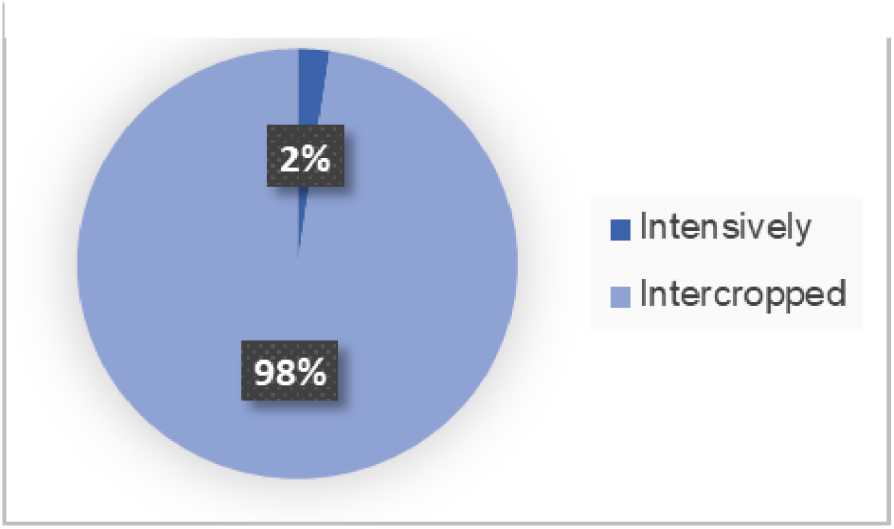
Figure 15. Structure of people' experiences in cocoa-production in Tien Giang (%)



(Source: Own processing based on questionnaire results)

Regarding the form of cultivation, the application rate of the cocoa intercropping method is overwhelming, with 83 households, equivalent to 98% of the total sample. Only two households grow concentratedly, accounting for 2%. It shows that growing cocoa intercropped with other crops is standard in the survey area. Due to the small scale of household production, intercropping helps increase land use efficiency. On the other hand, the cocoa tree's characteristic is that it likes shade, so it is often grown under the canopy of other trees, such as cashews and coffee. However, small intercropping also has disadvantages: applying technology, managing pests, and ensuring raw material quality takes much work.

Figure 16. Structure of cocoa cultivation form in Tien Giang (%)



(Source: Own processing based on questionnaire results)

Regarding the form of cultivation, the application rate of the cocoa intercropping method is overwhelming, with 83 households, equivalent to 98% of the total sample. Only two households grow concentratedly, accounting for 2%. It shows that the practice of growing cocoa intercropped with other crops is expected in the survey area. Due to the small scale of household production, intercropping helps increase land use efficiency. On the other hand, the cocoa tree's characteristic is that it likes shade, so it is often grown under the canopy of other trees, such as cashews and coffee. However, small intercropping also has disadvantages: applying technology, managing pests, and ensuring raw material quality is difficult.

5.2.1.1 Strength of Tien Giang province and Vietnam Cocoa Export Capacity

Tien Giang and Vietnam, in general, possess incredibly favorable natural conditions for cocoa tree development. Tien Giang is one of the provinces with large cocoa-growing areas in the Mekong Delta region. The climate, terrain, soil, and abundant water resources create an ideal environment for cocoa to thrive and yield high yields. The province has soil characteristics and the characteristic of growing many coconut trees, which are large shade trees favorable for cocoa development. Tien Giang province has launched a program mainly intercropping under coconut and other fruit trees, focusing on districts Cho Gao, Go Cong Tay, and Chau Thanh, after more than 15 years of implementing the cocoa project intercropping in coconut gardens. Despite many ups and downs, cocoa growers are still

determined to maintain and increase the area and no longer have the "cut plant" refrain like before.

Image 1. Cho Gao Cocoa Farm

(Source: Alluvia Chocolatier)

Vietnam possesses highly favorable natural conditions for cocoa tree development. Climate, terrain, soil, and abundant water resources create an ideal environment for cocoa to thrive and yield high yields.

Vietnam has a more than 3,260 km coastline, adjacent to the East Sea and the Gulf of Thailand. A long coastline and many large seaports are Vietnam's significant advantages in transporting and exporting goods, particularly cocoa. Specifically, Vietnam currently has 43 seaports, including many large seaports such as Hai Phong Port, Saigon Port, Da Nang Port, Quy Nhon Port, Cai Mep - Thi Vai Port, and Nghi Son Port. These large seaports have modern infrastructure, can receive large tonnage ships, and can import and export goods up to millions of tons/year. In addition, the geographical location adjacent to the East Sea and near international maritime routes is also a great advantage of Vietnam. Ships carrying export cocoa can easily access major maritime routes to transport to distant markets.

Vietnam has a dense network of rivers and canals distributed nationwide. The total length of rivers across the country is nearly 41,000 km; the Mekong River system alone accounts for about 4,300 km. In particular, Vietnam's leading cocoa-growing regions, such as the Central Highlands, Southeast, and South-Central regions, have quite dense river networks. For

example, the Central Highlands has the Se San, Se Re Pok, and Krong Ana Rivers; The Southeast has the Tien and Hau Rivers; The South-Central region has the Ba River. These large and small rivers and thousands of canals have created a convenient inland waterway transportation system. This dense river system is an excellent advantage for Vietnam in transporting goods in general and cocoa in particular. After harvesting, cocoa can be transported by inland waterway to processing factories or the nearest seaport for export.

Besides, the Government has issued preferential credit policies for cocoa-growing households through the Bank for Agriculture and Rural Development. These include preferential loans of 50-200 million VND for farmer households and 500 million VND for cocoa-growing cooperatives without collateral. The state budget supports farmers to restore production after natural disasters and epidemics, according to Decree 142/2009/ND-CP. Localities with large cocoa growing areas have policies to support farmers with capital, seeds, and techniques. For example, Dak Lak supports 50% of the value of seeds and fertilizers; Dak Nong supports a maximum of 10 million VND/1 hectare.

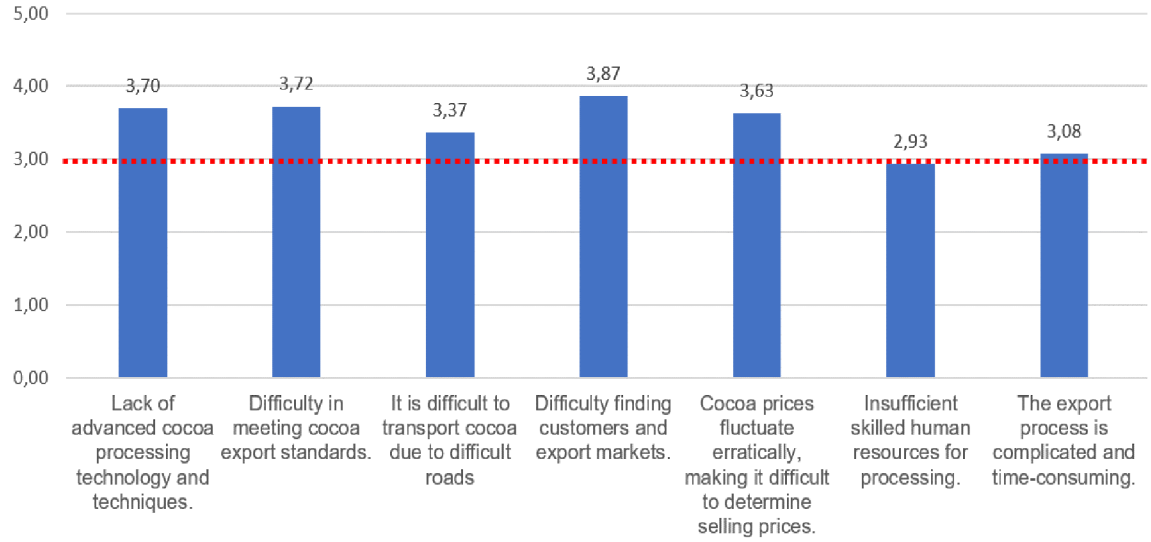
Tien Giang province also has many practical policies to create conditions for widely popularizing cocoa farming techniques and models in coconut gardens for people, such as Transferring science and technology for intensive farming and expanding the collection network, buying and consuming agricultural products for farmers, building clubs and groups to grow and transfer intensive cocoa farming techniques. Every year, the province organizes a Trade Promotion Conference in Tien Giang province to promote output for the province's fruit and cocoa products.

In Vietnam, in general, the Government established the Vietnam Cocoa Development Coordination Committee to coordinate and support industry development with members, including representatives of state management agencies, scientists, and domestic and foreign businesses related to the cocoa industry. The Vietnam Cocoa Development Coordinating Board supports and advises the Government on strategies and planning for cocoa industry development and coordinates with ministries and localities to implement projects and programs to develop cocoa trees. The activities of the Vietnam Cocoa Development Coordination Board will contribute to coordinating resources and improving investment efficiency for the cocoa industry, thereby supporting the sustainable development of Vietnam's cocoa production industry.

With characteristics of plant varieties and natural conditions, Vietnamese cocoa beans and cocoa products achieve high quality and are greatly appreciated by the international market.

5.2.1.2 Weaknesses of Vietnam's Cocoa Export Capacity

Figure 17. The difficulties in processing and selling cocoa.



(Source: Own processing based on questionnaire results)

According to a survey of 85 households engaged in cocoa farming and processing in Tien Giang province, when asked about their agreement with the statement "It is difficult to find customers and export markets," households all expressed their agreement with a very high average of 3.87/5, this is the aspect that surveyors in Tien Giang rated as the most difficult for them in processing and selling cocoa. Specifically, 81.18% of households had difficulty finding potential customers and export markets. Farmer households even shared that in the years 2016 and 2017, people in Tien Giang often fell into the situation of planting then cutting, cutting then planting partly because of fluctuating cocoa prices, mainly because of not being able to find the market. In Vietnam, although the quality of cocoa beans is highly appreciated internationally, trade promotion activities and promoting Vietnamese cocoa products to the international market still need to be improved. The Vietnamese cocoa brand has not been appropriately invested to enhance its value and reputation.

Cocoa farmers in Tien Giang also added that they are currently "Lacking advanced cocoa processing technology and techniques." This opinion has an average agreement level of 3.7/5, which is quite a high level but still needs clarification. Poor cocoa processing skills and technology lead to their products failing to meet cocoa export standards, with 58/80 households (accounting for 68.2% of the survey sample) facing difficulties. It is a very noteworthy point because, besides grain quality, processing technology also plays a decisive role in the quality of the final product.

Growing cocoa requires much time and effort, but the care is highly suitable for Vietnamese farming practices. There are more than 6 million cocoa growers worldwide, and 90% of cocoa is produced by small farmers today. Post-harvest fermentation and drying of cocoa beans is also carried out at the individual farm level. The lack of connectivity in the production chain is a bottleneck in ensuring product quality, transparency, and flavor. Technical barriers to trade, such as standards and quality regulations, are also significant obstacles to exports, requiring more extraordinary efforts to meet the regulations of import markets. Cocoa processing in Vietnam is still backward, mainly for small-scale producers. Cocoa powder export activities are almost insignificant; output is only about 100-200 tons/year, ranking 90th globally. Chocolate exports will reach only 33 million USD in 2022, accounting for only 0.2% of the global market share. The processing industry must be more robust to compete with solid countries such as the Netherlands, Belgium, and Germany.

Regarding infrastructure, 43/85 (accounting for 50.5% of the survey sample) of farming households in Tien Giang said they had difficulty transporting cocoa due to unsatisfactory road conditions. Degraded roads and potholes make travel difficult, especially during the rainy season. Therefore, transportation costs increase, affecting people's economic efficiency.

Image 2. Cai Lay bypass road (Tien Giang province) is seriously degraded

(Source: Laborer Newspaper, 2023)

Transportation infrastructure still needs to be improved, especially the rural road system. The rate of hardened rural roads is still low, only 20-40%. Roads still need to be more

profound and challenging to transport agricultural products. Although there are many seaports, they are small in scale and cannot meet the export of containerized goods.

Vietnam's cocoa growing area is currently distributed in many provinces and cities with mainly small and fragmented production scales. It leads to difficulties applying advanced farming techniques and improving productivity and product quality. In addition, the small scale of production also makes purchasing, processing, and exporting cocoa difficult.

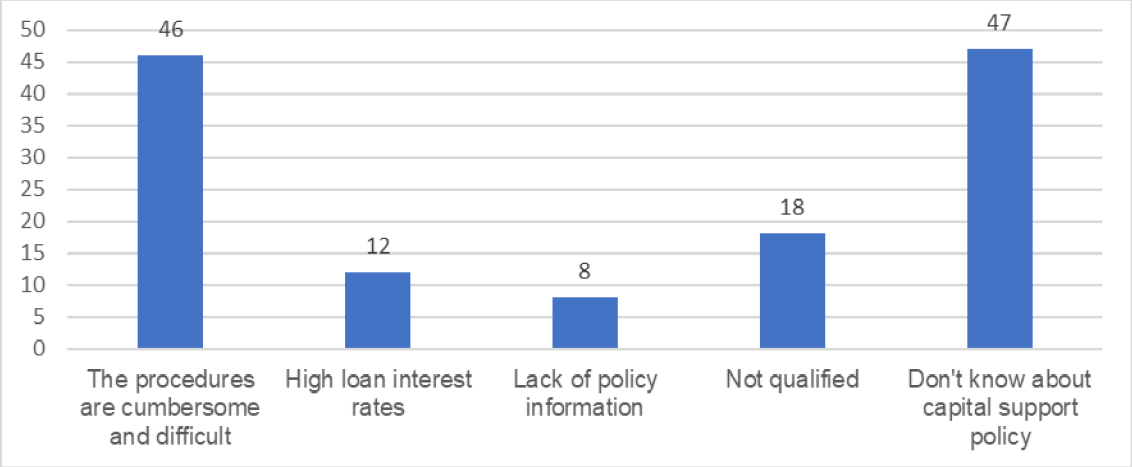
Vietnam's cocoa consumption market is mainly traditional, such as Belgium, the Netherlands, and Germany. Vietnam's cocoa consumption market has yet to be diverse and fully utilize potential markets such as China, India, etc.

Figure 18. The biggest difficulty in choosing and accessing good cocoa varieties

(Source: Own processing based on questionnaire results)

Initial investment costs for planting and caring for cocoa trees are still high, so many households need more interest. Based on the above survey results on the difficulties of cocoa-growing households in accessing cocoa varieties and caring for cocoa trees, the price factor is always a significant barrier in both processes. Specifically, the high price of cocoa seedlings is the most principal factor affecting people's access to cocoa varieties, with 73/85 farmers reporting that they have this problem. During the care process, in addition to other factors about cocoa trees such as "Cocoa trees are susceptible to many different pests and diseases" and "Harsh weather causes to grow," there are also factors like the cost of buying pesticides and fertilizers is also a significant problem for cocoa growing households with 62/85 households surveyed saying they encountered this problem.

Figure 19. The biggest difficulties in accessing capital sources and support policies to invest in developing cocoa cultivation



(Source: Own processing based on questionnaire results)

In specific research on why households have not been able to access capital support from the government, survey results showed that 47 households (accounting for the highest rate of 55%) admitted needing to learn about capital support policies for cocoa growing. It shows that information and policy propaganda work still needs to be improved. Forty-six households said the procedures for accessing loans and support needed simpler and more complicated. Eighteen households are not eligible to access support policies. In general, people still need help accessing policy capital. To solve this problem, authorities must simplify procedures, strengthen policy information, and support people to meet policy access conditions.

Besides the above difficulties, Vietnam's cocoa industry still has other weaknesses:

- Vietnam's cocoa growing area is distributed in many provinces and cities with mainly small and fragmented production scales. It leads to difficulties in applying advanced farming techniques improving productivity and product quality. In addition, the small scale of production also makes purchasing, processing, and exporting cocoa difficult.

- Vietnam's cocoa output is still meager, only about 5,500 tons/year. This number is only about 0.1% of global cocoa production. The reason is that the cocoa growing area has shrunk recently, from 25,700 hectares in 2012 to 5,028 hectares in 2019. Cocoa varieties grown are mainly salvaged varieties with low quality. Farming conditions are backward, and lack of technical support leads to low productivity.

- Vietnam's cocoa consumption market is mainly traditional, similar to Belgium, the Netherlands, and Germany. Vietnam's cocoa consumption market must still be more diverse and utilize potential markets, such as China and India.

5.2.1.3 Opportunities for Vietnam's Cocoa Export Production Industry

- **Global cocoa consumption demand is growing**

According to forecasts of the International Cocoa Organization (ICCO), global cocoa consumption demand will increase by an average of 2.6% per year from 2023-2027. It is due to the increase in population, living standards, and health awareness of consumers worldwide. The cause comes from:

- Population growth: The world population is expected to increase to 9.7 billion people by 2050, of which most of the population growth will be concentrated in developing countries, where there is high demand for cocoa consumption.
- Economic growth: Economic growth in developing countries also leads to increased demand for cocoa consumption, as people with higher incomes will be more likely to spend on high-quality products like cocoa.
- Health awareness: Health awareness among consumers is also increasing, leading to increased demand for cocoa consumption, as cocoa has many health benefits, such as reducing the risk of cardiovascular disease, stroke, diabetes, etc.

Growing demand for cocoa consumption will create opportunities for Vietnam's cocoa industry, helping to increase Vietnam's cocoa output and export value.

- **International cooperation**

Vietnam is actively cooperating with countries in the region and around the world to develop the cocoa industry. Typical forms of cooperation include scientific research, training, technology transfer, and trade cooperation. International cooperation brings many benefits to Vietnam's cocoa industry, including support for improving productivity and quality, expanding consumption markets, and forming a Vietnamese brand in the international market.

Over the years, Vietnam has become a cradle for small-scale artisanal chocolate production businesses, with many chocolate products launched to serve domestic demand. It is an opportunity for Vietnam to become a mid-range producer in the cocoa world, but many coordinated efforts from all parties involved are needed to achieve this goal. Growing cocoa requires much time and effort, but the care is highly suitable for Vietnamese farming practices. Post-harvest fermentation and drying of cocoa beans is also carried out at the

individual farm level. The lack of connectivity in the production chain is a bottleneck in ensuring product quality, transparency, and flavor.

- **The development of e-commerce**

E-commerce is growing strongly worldwide, creating opportunities for Vietnamese cocoa-growing businesses and cooperatives to access the global consumer market more efficiently. According to a survey by the Vietnam E-commerce Association (VECOM), e-commerce is still growing strongly, with a growth rate of over 22% in the first quarter of 2023 over the same period. Forecasts for the whole year can still reach over 25% with a scale of over 20 billion USD. This growth rate can be maintained in the period 2023 - 2025. According to a report by Kepios organization (an organization specializing in tracking online users in the world), the number of digital consumers in Vietnam in 2022 is 72 million, an increase of 3.4 million people compared to the previous year, accounting for 73% of the total population, of which 52 million people are using e-commerce, an increase of 13.5% over the same period in 2022. Annual spending on e-commerce is 12.4 billion USD, up 35.4% over the same period last year. Half of all purchases are made on mobile phones.

The explosion of e-commerce is an excellent opportunity for Vietnam's cocoa industry to promote exports and products globally with the ability to introduce and promote products to consumers worldwide quickly and widely.

- **The development of agricultural technology**

Current agricultural technology opens a lot of development opportunities for Vietnam's cocoa industry. Innovative technologies can help improve productivity quality and increase the competitiveness of the cocoa industry. Several potential technologies include:

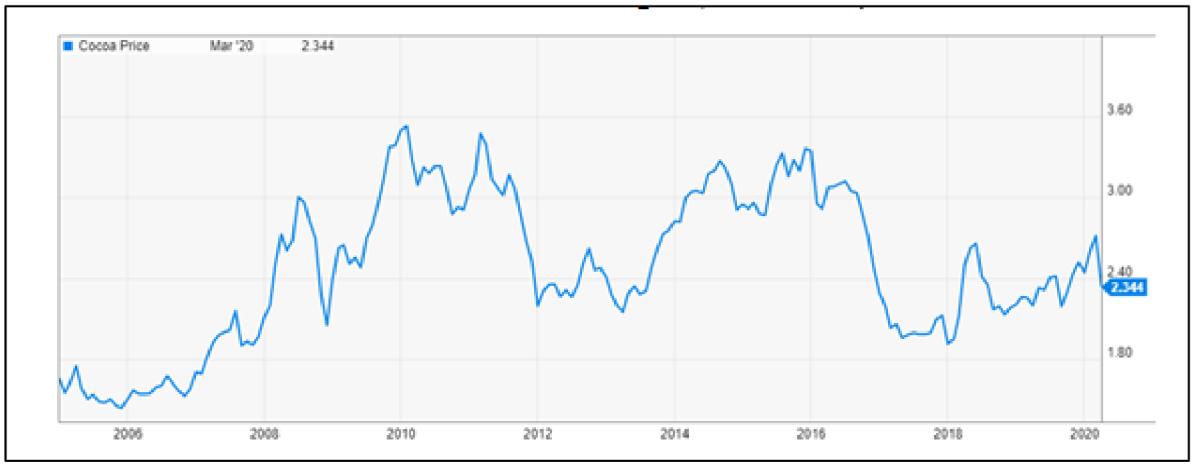
- Plant variety technology: Currently, there are research and development projects for cocoa varieties with higher yield and quality with better disease resistance.
- Farming technology: Modern farming methods such as automatic irrigation and reasonable fertilizers to improve productivity.
- Harvesting and processing technology: There are more and more agricultural machines to automate harvesting and processing processes to improve farming efficiency.
- Information technology: There are many data management and product traceability systems worldwide to improve quality management and control capabilities.

The combination of plant breeding technology, modern farming, automated harvesting, and information technology is opening excellent prospects for the agricultural industry in general and the cocoa industry in particular to create a sustainable and effective model.

5.2.2 Challenges for Vietnam's cocoa production and export industry

5.2.2.1 World cocoa prices fluctuate strongly

Figure 20. World cocoa prices in the period 2006-2020 (USD/kg)



(Source: Own processing based ICCO)

Cocoa prices in the world fluctuate enormously in cycles; on average, every 5-7 years, there will be a high price cycle followed by a low-price cycle. High price cycles typically last 2-3 years, followed by low price cycles that last 2-3 years.

During high price cycles, cocoa prices can double or even triple. For example, world cocoa prices have increased from about $2,200/ton in 2016 to $3,100/ton in 2018. During a low-price cycle, cocoa prices can fall below $2,000/ton. For example, world cocoa prices fell from 3,100 USD/ton in 2018 to 2,200 USD/ton in 2020 and have been on a solid upward trend from mid-2022 until now. The cocoa price at the end of 2023 is at an excellent level of 4,030 USD/ton (as in November 2023, ICCO).

Due to strong fluctuations in cocoa prices, it is difficult for Vietnamese cocoa exporters to forecast future cocoa prices accurately. It makes it difficult for businesses to plan production and business effectively. On the other hand, when cocoa prices decrease, Vietnamese cocoa exporters may have difficulty recovering investment capital.

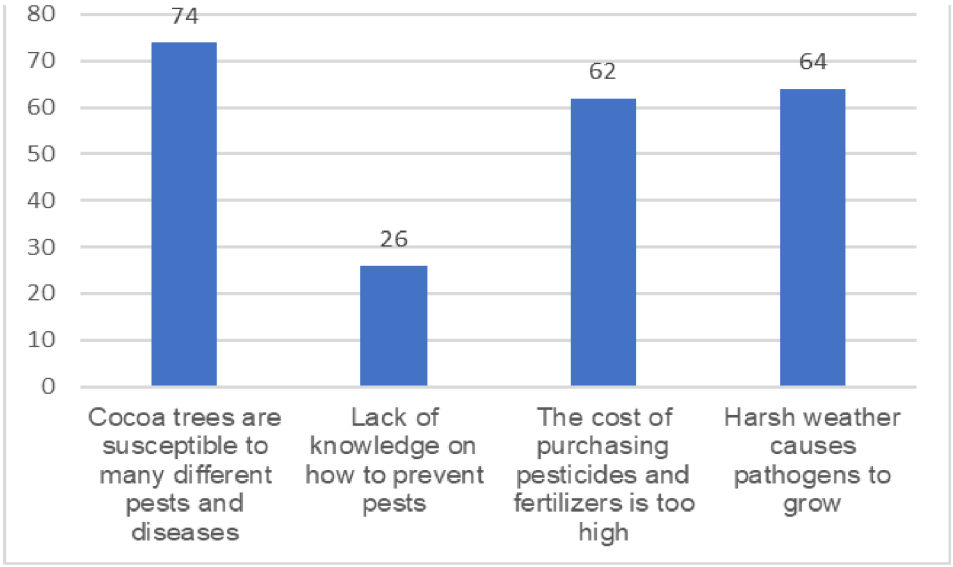
5.2.2.2 Cocoa trees are challenging to grow.

Unlike other native and exotic crops (coffee, cashew), the process and techniques of growing and caring for cocoa trees are extraordinarily complex. Cocoa trees need to be intercropped with at least four types of varieties (out of a total of 8), have shade trees and windbreak trees,

regularly control pests/diseases, care, and ferment. Cocoa trees cannot propagate themselves. When first planted, cocoa will die if there is no shade tree. According to an agricultural extension officer, 80% of newly planted cocoa is successful. Some households in Tien Giang planted, but the trees all died. Several families planted 0.5 hectares of cocoa but could not care for them, so the trees died and had to be abandoned. In gardens without shade trees, people must plant cassia trees to get a canopy before growing cocoa.

Also, people must build "huts" (one for each root) to block the wind and sun, and in cases where the garden already has shaded trees and fences, people must water it four times a month. For the tree to grow and produce more fruit, it is necessary to prune all extra branches growing on the tree trunk. Cocoa is a plant often attacked by lots of pests: stink bugs, fruit-rotting fungi, etc. Usually, there are stink bugs every two months, affected by the rainy season. Fruit rot also often occurs in rainy season conditions, while fungal rust is often caused by inadequate shading and is affected by fierce winds. Growing cocoa requires spraying every 20 days. Many fruit rot diseases caused by fungus currently have no cure, only spraying for prevention. Many people have not grown cocoa because cocoa growers need to be wholehearted and wholeheartedly care for the plants.

Figure 21. The difficulties in caring for and preventing pests and diseases of cocoa trees



(Source: Own processing based on questionnaire results)

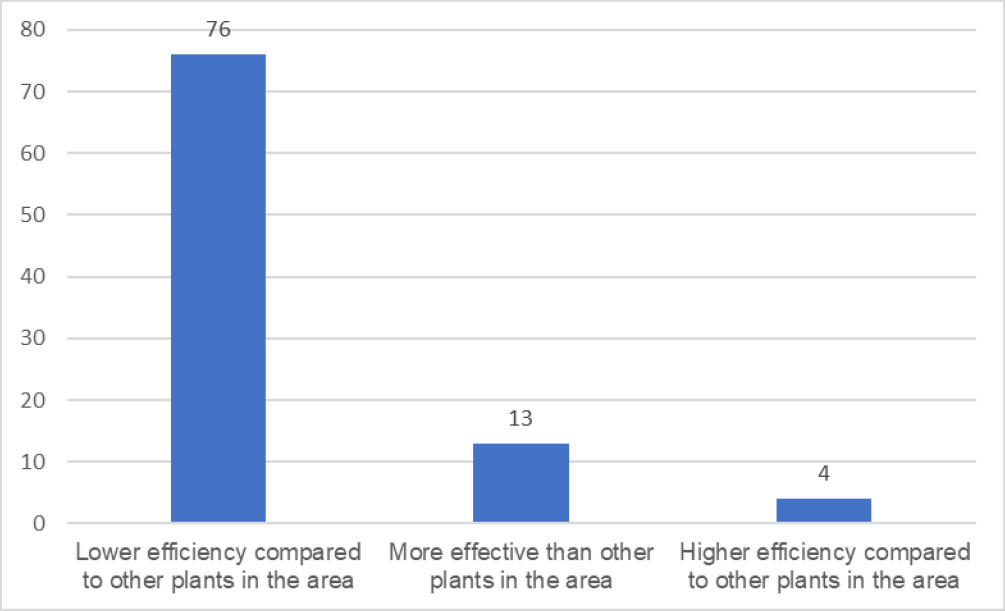
When surveying 85 cocoa-growing households in Tien Giang about the difficulties of cocoa growers when caring for cocoa trees, the results showed that growers had many difficulties, such as being susceptible to many infections and different types of pests (87% of households encounter this situation); Extreme weather causes pathogens to grow (more than 75

households encountered this situation); The cost of buying pesticides and fertilizers is too high (nearly 73% of households encounter this situation). Specifically, cocoa trees are susceptible to fungal diseases such as phytophthora fusarium, which cause branch rot, root rot, and bark ulceration, seriously affecting growth and productivity. Besides, pests such as stemborers, leaf miners, and red spiders are active all year round, thriving during the rainy season and causing severe harm. In addition, hot weather and heavy rain also cause pathogens to grow and spread throughout the garden.

Meanwhile, the cost of purchasing pesticides and fertilizers tends to increase yearly, putting tremendous pressure on growers, especially with fluctuating agricultural product prices. This situation makes it difficult for many households to maintain long-term economic efficiency from cocoa trees.

5.2.2.3 Lack of comparative advantage compared to coffee and other crops.

Figure 22. Economically effective of cocoa farming



(Source: Own processing based on questionnaire results)

The results of a survey of the opinions of 85 cocoa farmers in Tien Giang on the economic efficiency of growing cocoa compared to other crops in this area reflect an overall not optimistic situation. Most households (76) believe that growing cocoa's economic efficiency is lower than other crops. Although a small number of households (13) think that the efficiency is equivalent, and only four households think that the efficiency of growing cocoa is higher than that of other crops, this result also shows that it is realistic and practical. Many farmers need to appreciate the economics of cocoa.

The main reason given by households is that the initial investment cost for cocoa is much higher than for other crops such as rice, vegetables, and cash crops. At the same time, cocoa trees require careful care, effort, and expense. Meanwhile, productivity and product selling prices are low and unstable. In recent years, cocoa prices have fluctuated enormously, sometimes falling miserably, causing growers to lose capital. Besides, the risk of natural disasters and epidemics is also higher than other crops. People can lose the entire crop when faced with pests or crop failures. It makes people even more uneasy about developing cocoa trees.

Based on the cost-income analysis between coffee and cocoa, most cocoa growers will choose coffee to grow, not cocoa (100% of people surveyed said growing coffee would bring more significant economic benefit). The group discussion of Tien Giang commune officials also said that currently, cocoa is not a commodity crop here, but cashews and coffee.

According to Agrifood Consulting International (2008), the obstacles for people switching from coffee to cocoa are very clear:

While cocoa prices are rising, the situation is similar for coffee. Especially in large production areas like Tien Giang, the motivation for farmers to abandon coffee and switch to growing cocoa or even just intercropping with coffee is low. At current prices, coffee brings higher income, and its harvest time is concentrated, while the harvest time for cocoa lasts several months.

In addition, most farmers are familiar with coffee, while cocoa is a relatively new crop. Rubber can be a substitute crop for cocoa. Several points make people favor rubber, such as rubber being less risky, using fewer chemical fertilizers and water, requiring less care, less initial investment, bringing benefits in terms of biodiversity, and being more flexible in adapting to a broader range of agroecological conditions than coffee and rubber.

Besides coffee and rubber, other crops can also replace cocoa. Evidence of the advantages of cocoa compared to other competing crops needs to be demonstrated, introduced, and disseminated to farmers. Because cocoa does not have superior advantages over coffee, according to some stakeholders, it can only be grown in lands suitable for growing coffee. Regarding this, a leader of the Agricultural Extension Center of Tien Giang province analyzed: if in areas favorable for growing coffee, rubber, and pepper, cocoa trees cannot compete. However, in other areas, cocoa trees may be a more reasonable choice for people.

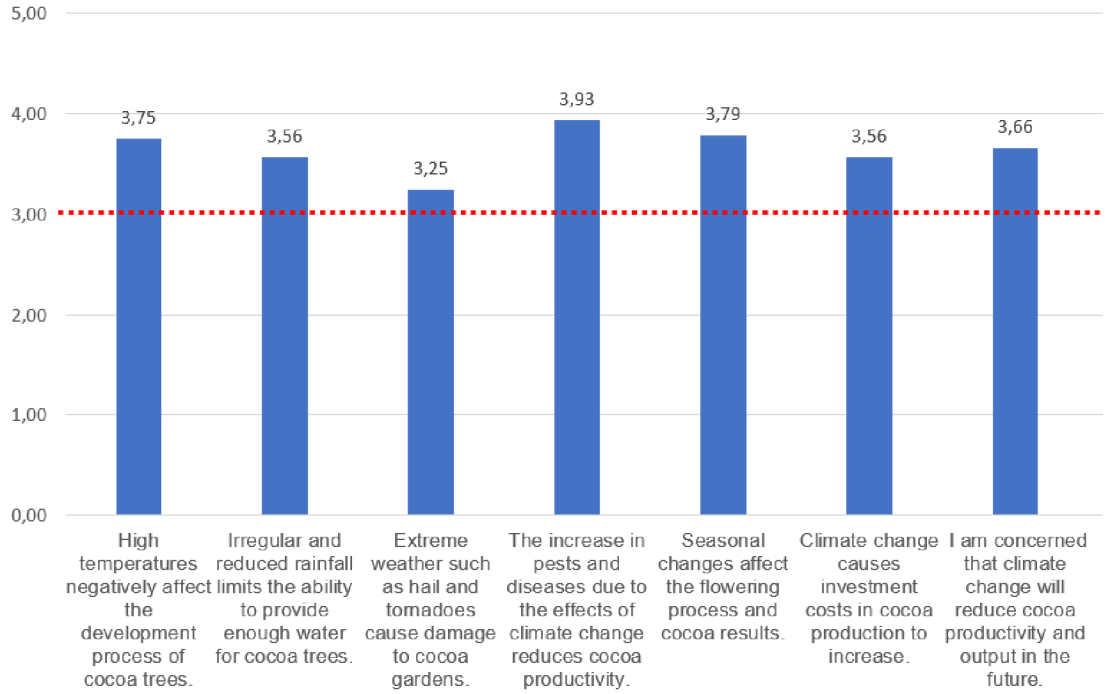
5.2.2.4 Fierce competition comes from major exporting countries.

Fierce competition in the cocoa industry is a big challenge for Vietnam. The world's leading cocoa-producing countries, Ghana, Ivory Coast, and Ecuador, all have many outstanding competitive advantages compared to Vietnam. Specifically, these countries have better cocoa productivity and quality than Vietnam, helping meet high-end export markets' strict requirements. The cocoa output of the world's leading countries is many times larger than Vietnam's.

Besides, these countries have the advantage of widespread export markets, including large markets such as the United States, Europe, and Asia. To compete effectively with leading countries in the world's cocoa industry, Vietnam needs fundamental solutions to improve productivity quality, expand consumption markets, and sustainably develop the domestic cocoa industry.

5.2.2.5 Climate change impacts

Figure 23. Agreement with the impact of climate change on the development of cocoa trees



(Source: Own processing based on questionnaire results)

Field surveys in Tien Giang province on the impact of climate change show that cocoa farmers perceive the negative impact of climate change on cocoa cultivation. Statements about the negative impacts of climate change on cocoa growing all have an average rating above level 3 (average level).

Regarding rising temperatures, up to 73 households (accounting for 85.9%) strongly agreed that this is the most influential negative factor. Temperatures that are too high and prolonged will cause cocoa trees to lack water and become stressed. Photosynthesis and metabolism are inhibited, leading to poor growth and development. In addition, high temperatures also stimulate the growth of pests and diseases that harm cocoa trees.

Regarding rainfall, 78 households (91.8%) are concerned that irregular rain and reduced rainfall will limit the ability to provide enough water for cocoa trees. Lack of water will directly affect the growth and productivity of plants. Meanwhile, 76 households (89.4%) expressed concern about increasing extreme weather phenomena such as hail and tornadoes that damage gardens and cause crop loss for households.

In particular, the increasing problem of pests and diseases due to the impact of climate change is a top concern for growers. Up to 79 households (92.9%) said this is the leading cause of the decline in productivity and cocoa output. Stem borers, leaf miners, anthracnose, and powdery mildew are rampant in cocoa gardens, especially in recent years.

Besides, climate change also upsets cocoa trees' growth and development rules. Survey results showed that 71 households (83.5%) identified that seasonal changes affect plants' flowering and fruiting process. It makes it difficult to apply appropriate farming practices.

Overall, climate change is causing investment costs for cocoa production to increase 68 households (80%) said they must spend more on pest control, investing in irrigation systems, and resisting natural disasters to maintain and develop gardens. It is a significant burden for farmers.

In general, growers are very worried that climate change will continue to reduce cocoa productivity and output shortly, threatening the long-term economic efficiency of this crop. Appropriate adaptation solutions are needed to support people in proactively coping with the adverse impacts of climate change.

Climate change is becoming a significant challenge for the cocoa industry in Vietnam, and according to a report by the Food and Agriculture Organization of the United Nations (FAO), this situation can lead to a global decrease in the productivity of cocoa trees.

The increase in global temperature, expected to increase from 1.5 to 2.1 degrees Celsius by the end of the 21st century, according to the Intergovernmental Panel on Climate Change (IPCC), is causing many adverse effects on the cocoa industry in Vietnam. High temperatures can affect the cocoa tree's ability to flower and set fruit, causing reduced yield and quality. In addition, rainfall variability, according to IPCC forecasts, may increase by 1-

2% by the end of the 21st century. This change could significantly impact the cocoa industry in Vietnam, especially regarding water shortage and upstream water flow, which are significant problems for cocoa trees. Water shortages can occur when temperatures increase and rainfall changes, leading to cocoa trees not having enough water to grow, affecting productivity and quality. In addition, going upstream is also a significant risk when rising sea levels penetrate the mainland. It can cause flooding of cocoa-growing land, creating favorable conditions for developing pests and diseases.

Pests, such as aphids, stink bugs, and stem borers, are becoming more common in cocoa-growing areas due to climate change. Cornell University research indicates that changes in climatic conditions may favor the more extraordinary occurrence of these worms. It increases the risk of harming cocoa trees, reducing cocoa yield and quality.

According to the Investment Newspaper (2023), frequent severe weather events caused by El Nino and climate change affect cocoa production. Hotter temperatures and changes in rainfall can also harm cocoa pod growth and promote the spread of pests. According to the latest report, El Nino is expected to last until January - March 2024 with a 71% chance of strengthening from November 2023 to January 2024. Enhanced and permanent El Nino effects could significantly reduce the amount of arable land available for cocoa cultivation.

5.3 Solutions to improve Vietnam's cocoa production and export capacity.

5.3.1 Summary of SWOT analysis for Vietnam cocoa industry

Table 9. Summary of SWOT analysis for Vietnam cocoa industry

Strengths	Weaknesses
- Favorable natural conditions for cocoa growing: climate, terrain, land, water resources - Large river system and many seaports convenient for transportation - Government support policies on loans, subsidies, and coordination - High-quality cocoa beans and products are highly appreciated internationally	- Low productivity and small production scale - Outdated processing technology, mainly from small households - Infrastructure develops slowly, especially rural roads - Cocoa growing areas are scattered, making it challenging to apply advanced agricultural methods

- Long coastline and geographical location near international shipping routes	- Traditional export markets, lack of market diversification
Opportunities	**Threats**
- Global demand for cocoa is increasing - International cooperation in science, technology, and trade - Developing e-commerce - Fierce competition from major exporting countries	- World cocoa prices fluctuate widely - Difficulties in growing cocoa - Lack of comparative advantage compared to coffee and other crops - Fierce competition from major exporting countries - Climate Change

(Source: Own processing base on Part 4.1)

5.3.2 Strategic Solutions Combining Strengths- Opportunities

5.3.2.1 Develop and take full advantage of the advantages of natural conditions, developed river networks, and seaports in cocoa production.

Vietnam possesses favorable natural conditions for developing cocoa trees, such as a humid tropical climate, suitable rainfall, and low mountainous terrain with many rivers and streams. The main cocoa production regions, such as the Central Highlands, the Southeast, and the South-Central region, all have dense systems of rivers and canals, convenient for transportation and irrigation. Besides, Vietnam has advantages in transporting and exporting cocoa with a long coastline and many large seaports such as Hai Phong, Saigon, and Da Nang. Therefore, Vietnam must identify and develop concentrated cocoa-growing areas of thousands of hectares in favorable conditions near rivers and seaports to take full advantage of the available natural advantages.

5.3.2.2 Applying advanced farming technology and mechanization to improve cocoa productivity and quality.

To improve cocoa productivity and quality, Vietnam must promote modern farming technology, such as automatic drip irrigation systems, and mechanized machinery and equipment, such as plows, fertilizers, and harvesters. Instead of manual labor, machines will help save labor while ensuring science, accuracy, and consistency in the growing process. New cocoa varieties also need to be researched and replicated to improve productivity. Thanks to innovative technology, cocoa farming will achieve higher productivity and quality.

5.3.2.3 International cooperation on seed research and technology transfer to improve production capacity.

Vietnam must proactively cooperate with reputable foreign partners in plant variety research and cocoa processing technology to exchange and transfer technology. Collaborative research projects must be implemented to breed high-yield, high-quality cocoa varieties suitable for Vietnamese conditions. At the same time, modern cocoa processing technologies must also be transferred to improve product value. International cooperation in science and technology will help Vietnam's cocoa industry access the latest achievements, improving production capacity and competitiveness.

5.3.2.4 Building brands and promoting the trade of Vietnamese cocoa on international e-commerce platforms.

To promote and expand export markets, cocoa businesses need to build and promote Vietnamese cocoa brands on e-commerce platforms such as Amazon, Alibaba, and Ebay. International e-commerce platforms attract millions of potential customers and are an effective channel to promote and sell globally. Businesses must focus on creating detailed product introduction content, vivid images, and a commitment to good quality to attract buyers. E-commerce promotion will promote brands and expand the consumption market for Vietnamese cocoa products.

5.3.3 Strategic solutions combining Weaks- Opportunities

5.3.3.1 Investing in modern processing technology and building a high-quality cocoa brand.

To improve the value and competitiveness of cocoa products, Vietnam must invest in building large-scale processing factories equipped with modern technology lines that meet international standards. Steps such as roasting, peeling, grinding, and refining need to be completely mechanized to ensure hygiene and quality. At the same time, businesses need to invest in research and development of cocoa products with high added value. Building private brands and labels for Vietnamese cocoa products is essential to affirm quality and reputation.

5.3.3.2 Training to improve cocoa cultivation techniques for farmers.

To improve cocoa productivity and quality, authorities at all levels need to organize training on advanced cocoa farming techniques for farmers. Training courses must provide complete knowledge of variety selection, planting techniques, care, pest control, harvesting, and post

-harvest preservation according to proper procedures. Training content should be compiled in local languages for easy understanding. At the same time, technicians must also be guided to provide technical support to farmers in the garden. Training will help farmers apply science and technology to production, improving productivity and quality.

5.3.3.3 Apply blockchain technology and QR codes to manage product quality strictly

To manage product quality and origin, cocoa businesses need to invest in building a traceability system based on blockchain technology and QR codes. Accordingly, each batch of products will be labeled with a QR code containing detailed information such as planting location, harvest time, and processing. Consumers can use their phones to scan the QR code to trace the origin and check quality. This system will improve transparency, quality control, and reputation among consumers.

5.3.3.4 Supporting businesses in accessing e-commerce platforms to expand export markets

The government needs policies to support cocoa businesses accessing e-commerce platforms such as Amazon Alibaba, and Ebay to promote and export products. Specifically, businesses need support with information, advice on building booths, posting products, introducing business information, and selling on e-commerce platforms. The government can partially support costs for businesses participating in e-commerce platforms. The support will help businesses expand the cocoa export market globally with low cost and high efficiency.

5.3.4 Strategic solutions combining Strengths-Threats

5.3.4.1 Diversify export markets, search for new potential markets.

Vietnamese businesses must proactively seek and expand into new potential markets such as China, Japan, Korea, Southeast Asian countries, the Middle East, and Africa.

Vietnam's cocoa export market still focuses on some traditional markets, such as Europe and America. Expanding the market will help reduce dependence, increase competitiveness, and stabilize product output. Specific solutions:

- Research and evaluate countries' potential and market trends to select target markets.
- Trade promotion product introduction at international fairs and exhibitions.
- Build effective distribution and marketing strategies for each new market.
- Invest in production line technology to meet the export standards of other countries.

Proactively expanding and searching for new markets will help cocoa businesses diversify consumption markets, improve competitiveness, and promote exports.

5.3.4.2 Building a Vietnamese cocoa brand with stable quality and a high reputation.

To enhance the position of Vietnamese cocoa in the world market, businesses need to invest in building and promoting high-quality brands with solid reputations through:

- Develop quality standards and commit to always providing products of high and stable quality.
- Invest in modern production lines to strictly control the process.
- Certification of international standards on food safety and origin traceability.
- Develop luxurious product packaging and labels, demonstrating brand reputation.
- Widely promote prestigious certifications and product quality.

5.3.4.2 Research and develop cocoa products with high-added value

Businesses must focus on researching and developing processed products with higher content and value. Some potential products include Pure cocoa, cocoa powder, cocoa chocolate, cocoa confectionery, cocoa coffee, and cocoa smoothies. Specific solutions:

- Invest in research and new product development.
- Buy production technology copyrights from advanced countries.
- Invest in modern production lines to ensure quality.
- Build eye-catching packaging designs and unique brands for products.
- Researching new products will increase the competitiveness of Vietnamese cocoa.

5.3.4.3 Proactively reserve inventory to stabilize selling prices when world cocoa prices fluctuate.

Because world cocoa prices fluctuate enormously, Vietnamese businesses must proactively reserve certain goods in warehouses to stabilize supply and selling prices. Specifically, when cocoa prices are low, businesses can sell inventory instead of buying it at high prices. On the contrary, when prices increase sharply, businesses still have a stable supply of stored goods to sell instead of having to buy at high prices. Thus, stockpiling helps businesses proactively supply, sell stably, and have higher profits in all situations of changes in world cocoa prices.

5.3.4.4 Responding to climate change.

Vietnam's cocoa industry needs solutions such as

- Research and breed cocoa varieties that are highly resistant to drought and high temperatures.
- Using fertilizers and farming techniques helps increase the soil's ability to hold water and nutrients.
- Build an automatic irrigation system that saves drip water or sprinkler irrigation.

- Make the most of surface and underground water sources and build reservoirs to store irrigation water.
- Plant shade trees and windbreaks alternately to reduce the impact of hot sun and strong winds.

These solutions will help the cocoa industry proactively adapt better to harsh climatic conditions caused by climate change.

5.3.5 Strategic solutions combining Weaks – Threats

5.3.5.1 Invest in technology innovation to improve productivity and product quality

Vietnam must invest heavily in technological innovation throughout the entire cocoa industry value chain, from raw material production, harvesting, and processing to product preservation and transportation. Specifically, the State needs to promulgate policies to encourage investment in modern technology in agriculture, such as reducing import taxes on machinery and equipment, supporting interest rates on technology investment loans, and tax incentives for investing businesses in research and technology transfer. Cocoa businesses must actively research and import advanced technology in seed production, cultivation, harvesting, preliminary processing, and processing to mechanize to save labor and improve productivity and uniform quality. Some advanced technologies that must be prioritized include disease-resistant cocoa breeding technology, automatic irrigation technology, automatic picking machines, and modern cocoa drying and preservation technology. The change in new technology will help improve productivity and product quality, thereby enhancing the competitiveness of Vietnamese cocoa in the world market.

5.3.5.2 Build a concentrated raw material area to apply advanced farming techniques

Vietnam must form large-scale concentrated raw material areas with thousands of hectares in leading cocoa-growing regions such as the Central Highlands, South Central, and Southeast to improve productivity and quality. Localities need to plan and call for investment to develop raw material areas according to the large-field model, applying the same advanced farming techniques to ensure productivity and quality. Specific solutions are as follows:

- Select high-yield, high-quality cocoa varieties suitable for each ecological region to provide farmers with seeds to propagate.
- Build an automatic drip irrigation system to save water.
- Use organic fertilizers and microbial fertilizers to improve soil fertility.

- Apply reasonable pest control techniques to limit the use of pesticides.

Hiring businesses that provide mechanization services for soil preparation, fertilization, and watering helps save labor. Applying the same synchronous technical process will help improve the productivity and quality of cocoa raw materials.

5.3.5.3 Reorganize production into linked chains to control quality and costs

Accordingly, cocoa production and processing enterprises must sign association contracts with cooperatives and farmers to purchase products. The parties agree on production processes, quality standards, and payment methods to ensure benefits for both sides. The state needs policies to support production linkages, such as technical training for farmers, loan interest rate support, and the introduction of successful linkage models. The close linkage between production and consumption stages will help better control the quality of input materials and output costs, improving product competitiveness.

5.3.5.4 Support businesses to expand into potential markets

To diversify export markets and increase competitiveness, the Government needs strong policies to support cocoa businesses expanding into potential markets, such as:

- Negotiating and signing Free Trade Agreements (FTA) to reduce tariffs on cocoa exports to new markets such as China, Japan, Korea, and Southeast Asian countries
- Organize trade promotion delegations, fairs, and exhibitions to introduce products in potential markets.
- Support businesses in market research, trademark registration, building distribution channels, and product marketing strategies in new markets.
- Create favorable conditions for businesses to access preferential capital sources to expand production investment and improve export capacity.

The above solutions will help cocoa businesses access more potential markets, increasing competitiveness and promoting Vietnam's exports.

6. Discussion and Recommendation

Results of analysis of the status of cocoa production and export industry in Vietnam show that cocoa bean export output is still very modest, only reaching about 1,895 tons in 2022, ranking 25th in the world. Cocoa powder exports are almost zero, while chocolate exports only reached 33 million USD, accounting for 0.2% of the global market share. It shows that Vietnam's cocoa product processing industry still needs to improve. Regarding production

status, Vietnam's cocoa area and productivity are also low. According to 2019 data, the area remains 5,028 hectares, and output reaches 5,500 tons/year, only 0.1% of world output. Most of the planted area is small and scattered, making applying science and technology to improve productivity and quality difficult. However, Vietnamese cocoa beans are highly appreciated for their fermentation ability and quality. Some Vietnamese cocoa products have also won international awards, affirming their quality and brand.

Assessing the factors affecting Vietnam's cocoa export capacity using the SWOT method, the results show that Vietnam has favorable natural conditions for cocoa development, such as a humid tropical climate, abundant rain, and diverse terrain. In particular, the Central Highlands, Southeast, and South-Central regions are very suitable for growing cocoa. Besides, Vietnam has good support policies for developing the cocoa industry, such as credit incentives, technical support, and tree varieties. The National Cocoa Development Coordination Committee was established to orient and support the industry. In particular, Vietnamese cocoa beans are highly appreciated for their fermentation ability and quality. Some Vietnamese cocoa and chocolate products have also won international awards, contributing to branding the industry.

However, Vietnam's cocoa output is still low, reaching only 5,500 tons/year, only 0.1% of world output. The cause is poor tree varieties, shrinking acreage, outdated farming conditions, and lack of technical support. Vietnam's cocoa product processing industry, mainly small establishments, still needs to improve. Cocoa powder export activities are almost negligible. Chocolate exports have reached 33 million USD; the market share needs to increase. Trade promotion and branding of Vietnamese cocoa in the international market still have many limitations. The main export markets are still traditional markets, not yet diversified. Transportation infrastructure, especially rural roads, still needs to improve, affecting the transportation and export of products.

Regarding opportunities: The cocoa industry has strong global cocoa consumption demand, about 2.6% per year from 2023-2027. It is an excellent opportunity for Vietnamese cocoa to increase output and export value. Vietnam proactively integrates and cooperates extensively with international partners to develop the cocoa industry. Forms of cooperation such as human resource training, technology transfer, technical support, production and consumption linkage will improve the capacity of Vietnam's cocoa industry.

Regarding challenges: World cocoa prices fluctuate enormously every 5-7 years, causing Vietnamese cocoa exporters to face many risks and difficulties in investment and business.

Competition is increasingly fierce from cocoa exporting giants such as Ghana, the Ivory Coast, and Indonesia, which have many advantages over Vietnam regarding output, quality, and consumption market. Climate change and extreme weather phenomena are increasingly common. It causes many adverse effects on the growth and productivity of cocoa trees. In addition, pests and diseases that damage cocoa trees are also increasing, posing many potential risks for the industry. Cocoa trees are challenging to grow and require much care. Meanwhile, economic efficiency differs from other popular crops, such as coffee and cashews. It makes farmers interested in something other than investing.

Thus, the analysis of SWOT factors shows that Vietnamese cocoa still has many challenges ahead. Vietnam needs strategic and synchronous solutions to improve competitiveness and sustainably develop the cocoa industry, from production to processing and product consumption.

The analytical results of this study and the studies of Coulter and Abena (2010), Arifin (2013), and Nguyen Huu Tam and Luu Duc Thanh Hai (2016) all agree on some essential points. The research of Coulter and Abena (2010) and this paper both confirm that the climate and soil conditions in cocoa-producing countries such as Vietnam and Cameroon are ideal for cultivating cocoa trees. In addition, the author and Arifin's research (2013) both see great potential in the domestic market for products processed from cocoa.

However, unlike Arifin's (2013) study, it mainly focuses on solutions to improve competitiveness, while the author analyzes both export and production capacity. Compared to the research of Nguyen Huu Tam and Luu Thanh Duc Hai (2016) on the Ben Tre cocoa value chain, the thesis expands the scope of analyzing the value chain and assessing export capacity. The thesis also uses many secondary data sources from statistical agencies and international organizations to ensure greater objectivity. However, the two studies both emphasize local governments' critical role in supporting the cocoa industry's development.

Compared to Le Quang Binh and colleagues' (2012) research on barriers to developing cocoa trees in Dak Lak, the thesis has a broader scope, a general analysis of the entire cocoa industry in Vietnam, not limited to a locality. The two studies used similar qualitative methods, but the thesis also added quantitative analysis. As a result, the thesis points out the common challenges and opportunities of the industry instead of being localized like Le Quang Binh's research.

Compared to other studies, this study takes a more comprehensive approach, analyzing not only output, quality, and exports but also factors affecting the global development of this

significantly differently characterized industry. In contrast, previous studies have often focused on specific aspects of the cocoa industry, such as growing techniques, processing, consumption, and policy. Regarding research methods, this thesis uses a series of quantitative and qualitative research methods such as surveys, in-depth interviews, and SWOT analysis. Meanwhile, most previous studies usually focus on more than one of these methods. Finally, following recent research trends in the cocoa industry, this study also emphasizes solutions to increase product-added value through marketing, branding, and sustainable development activities. It reflects the general trend of the research community.

7. Conclusion

Through combined qualitative (in-depth interviews, group discussions) and quantitative (surveys, statistical analysis) research methods, such as the studies of Coulter and Abena (2010) and Arifin (2013), The author analyzed the economic, technical, and social aspects of cocoa tree development. However, in this research article, the author has conducted in-depth research analyzing and evaluating Vietnam's cocoa export capacity through the SWOT model. At the same time, most old studies focused on the cocoa production stage. Furthermore, the study analyzes factors that affect businesses' export decisions, an issue rarely mentioned in previous research.

The results show that Vietnam's cocoa industry faces many opportunities and challenges to develop production and improve global market competitiveness. With favorable natural conditions, growing market demand, and the increasing trend of healthy cocoa consumption, Vietnam can become one of the world's leading cocoa-producing and exporting countries. However, Vietnam's cocoa industry still faces many challenges, such as low productivity and quality, outdated processing technology, and lack of large-scale concentrated raw material areas. This result is like the results of research by Le Quang Binh and colleagues (2012), Nguyen Huu Tam and Luu Thanh Duc Hai (2016); the authors said that because the economic value of cocoa is not high compared to other crops, cocoa growing has not been focused and quality management has been strictly controlled. In addition, fierce competition from the world's leading exporting countries and cocoa price fluctuations also causes many difficulties for Vietnam's production and export.

To promote Vietnam's cocoa industry, the author proposes that we unanimously invest in high technology from planting to transportation, develop raw materials according to technical processes, build international brands, and expand diversified export markets. At

the same time, research new products from cocoa and support businesses with preferential policies, thereby enhancing their position and competing strongly in the global market.

Although it brings research and practical significance, the article still has limitations. The essay currently faces significant limitations due to a need for more depth in analyzing technical issues of cocoa cultivation and processing, relying only on some old research without going into detail. The proposed solution is still general and needs detailed and specific information for each cocoa industry value chain stage. In addition, the number of surveyed households was low and conducted in a short time, causing the survey sample not to represent the comprehensive picture of the industry, reducing the objectivity and accuracy of the results.

Future research directions could focus on specific aspects to improve the quality and applicability of the cocoa industry in Vietnam. The study can also expand the survey scope and increase the number of participating households to ensure representation and transparency in collected data. Extending the research period will help better understand industry fluctuations and create a complete database for strategic decisions. In addition, it is possible to focus on research and development of new products from cocoa to optimize added value and meet international market needs. Finally, the research direction may also involve evaluating and monitoring the effectiveness of support policies from the State to ensure the sustainability and development of the cocoa industry in Vietnam.

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9. List of pictures, tables, graphs, and abbreviations

9.1 List of pictures

9.2 List of tables

9.3 List of graphs

9.4 Abbreviations

AIPC	Association of the Cocoa Processing Industry
CAA	Cocoa Association of Asia
CCC	Coffee and Cocoa Council
COCOBOD	Ghana Cocoa Board
DANIDA	Danish International Development Agency
ECA	European Cocoa Association
EU	European Union
FTA	Free Trade Agreements

GPEP	Government's Export Promotion Policies
ICCO	International Cocoa Organization
ITC	International Trade Center
MSMEs	Micro, small, and medium enterprises
NCA	National Chemical Association
NGOs	Non-Governmental Organizations
OCOP	One Commune One Product
SCI	Small and Medium Enterprises
SMEs	Supply Chain Integration
VCC	Vietnam Cocoa Development Coordination Committee
WCF	World Cocoa Federation

Appendix

Appendix 1: Questionnaire

Dear Sir/Madam!

I am conducting research on the current situation and difficulties of people in cocoa production and export activities in Tien Giang. I hope you will take some time to answer the following survey questions. I assure you that all of your information will be absolutely confidential and will only be used for research purposes.

Sincerely thank you for your cooperation!

PART I. PERSONAL INFORMATION

1. What is your age?

□ Under 20 years old

□ From 20 to under 30 years old

□ From 30 to under 40 years old

□ From 40 to under 50 years old

□ Over 50 years old

2. Are you a cocoa grower or processor?

□ I have grown or processed cocoa

□ I am growing cocoa

□ I am working in cocoa processing

□ I am currently working as a cocoa farmer and processor

3. Number of years of experience working with cocoa

□ Less than 1 year

□ From 1 to less than 3 years

□ From 3 to less than 5 years

□ Over 5 years

4. Do you grow cocoa trees intensively or intercropped?

□ Intensively

□ Intercropped

PART II. MAIN CONTENT

5. In your opinion, what is the biggest difficulty in choosing and accessing good cocoa varieties?

□ Good varieties are rare and difficult to find and buy

□ Seed prices are too high

 Don't know a reputable place that sells seeds

6. What difficulties do you often encounter in caring for and preventing pests and diseases of cocoa trees?

 Cocoa trees are susceptible to many different pests and diseases

 Lack of knowledge on how to prevent pests

 The cost of purchasing pesticides and fertilizers is too high

 Harsh weather causes pathogens to grow

7. You have received information about capital support policies for cocoa growers

 I have

 I have not

8. What are the biggest difficulties you encounter in accessing capital sources and support policies to invest in developing cocoa cultivation?

 The procedures are cumbersome and difficult

 High loan interest rates

 Lack of policy information

 Not qualified

 Don't know about capital support policy

9. Compared to other crops, how economically effective do you think cocoa farming is?

 Lower efficiency compared to other plants in the area

 More effective than other plants in the area

 Higher efficiency compared to other plants in the area

10. Please choose your level of agreement (From level 1 - Completely disagree to level 5 - Completely agree) with the following statements about the effects of climate change on cocoa development.

- High temperatures negatively affect the development process of cocoa trees.
- Irregular and reduced rainfall limits the ability to provide enough water for cocoa trees.
- Extreme weather such as hail and tornadoes cause damage to cocoa gardens.
- The increase in pests and diseases because of climate change reduces cocoa productivity.
- Seasonal changes affect the flowering process and cocoa results.
- Climate change causes investment costs in cocoa production to increase.
- I am concerned that climate change will reduce cocoa productivity and output in the future.

11. Please choose your level of agreement (From level 1 - Completely disagree to level 5 - Completely agree) with the following statements about difficulties in processing and selling cocoa?

- Lack of advanced cocoa processing technology and techniques.
- Difficulty in meeting cocoa export standards.
- It is difficult to transport cocoa due to difficult roads
- Difficulty finding customers and export markets.
- Cocoa prices fluctuate erratically, making it difficult to determine selling prices.
- Insufficient skilled human resources for processing.
- The export process is complicated and time-consuming.

Thank you very much!

Appendix 2: Questionnaire result

Characteristic	**Items**	**Frequency**	**Frequency rate (%)**
Age	Under 20 years old	8	9,41%
	From 20 to under 30 years old	48	56,47%
	From 30 to under 40 years old	21	24,71%
	From 40 to under 50 years old	8	9,41%
	Over 50 years old	0	0,00%
You are a cocoa grower or processor	I have grown or processed cocoa	16	18,82%
	I'm growing cocoa	12	14,12%
	I am working in cocoa processing	3	3,53%
	I am currently working in growing and processing cocoa	54	63,53%
Number of years of experience working with cocoa	Less than 1 year	6	7,06%
	From 1 to 3 years	16	18,82%
	From 3 to 5 years	26	30,59%
	Over 5 years	37	43,53%
	Intensively	2	2,35%

Do you grow cocoa trees intensively or intercropped?	Intercropped	83	97,65%
In your opinion, what is the biggest difficulty in choosing and accessing good cocoa varieties?	Good varieties are rare and difficult to find and buy	7	8,24%
	Seed prices are too high	73	85,88%
	Don't know a reputable place that sells seeds	5	5,88%
What difficulties do you often encounter in caring for and preventing pests and diseases of cocoa trees?	Cocoa trees are susceptible to many different pests and diseases	74	87,06%
	Lack of knowledge on how to prevent pests	26	30,59%
	The cost of purchasing pesticides and fertilizers is too high	62	72,94%
	Harsh weather causes pathogens to grow	64	75,29%
You have received information about capital support policies for cocoa growers	I have	38	44,71%
	I have not	47	55,29%
What are the biggest difficulties you encounter in accessing capital sources and support policies to invest in developing cocoa cultivation?	The procedures are cumbersome and difficult	46	54,12%
	High loan interest rates	12	14,12%
	Lack of policy information	8	9,41%
	Not qualified	18	21,18%
	Don't know about capital support policy	47	55,29%
Compared to other crops, how economically effective do you think cocoa farming is?	Lower efficiency compared to other plants in the area	76	89,41%
	More effective than other plants in the area	13	15,29%

	Higher efficiency compared to other plants in the area	4	4,71%
Total		**85**	**100,00%**

1. Please choose your level of agreement (From level 1 - Completely disagree to level 5 - Completely agree) with the following statements about the effects of climate change on cocoa development.

Observed variables	Levels					Mean
	1	2	3	4	5	
High temperatures negatively affect the development process of cocoa trees.	4	12	18	23	32	3,75
Irregular and reduced rainfall limits the ability to provide enough water for cocoa trees.	5	11	22	31	20	3,56
Extreme weather such as hail and tornadoes cause damage to cocoa gardens.	5	21	27	19	17	3,25
The increase in pests and diseases due to the effects of climate change reduces cocoa productivity.	4	6	18	25	36	3,93
Seasonal changes affect the flowering process and cocoa results.	4	5	28	21	31	3,79
Climate change causes investment costs in cocoa production to increase.	4	9	25	35	16	3,56

I am concerned that climate change will reduce cocoa productivity and output in the future.	6	9	18	32	24	3,66

9. Please choose your level of agreement (From level 1 - Completely disagree to level 5 - Completely agree) with the following statements about difficulties in processing and selling cocoa?

Observed variables	Levels					Mean
	1	2	3	4	5	
Lack of advanced cocoa processing technology and techniques.	4	11	13	41	20	3,70
Difficulty in meeting cocoa export standards.	3	8	20	38	20	3,72
It is difficult to transport cocoa due to difficult roads	10	5	31	28	15	3,37
Difficulty finding customers and export markets.	2	3	15	54	15	3,87
Cocoa prices fluctuate erratically, making it difficult to determine selling prices.	4	6	25	38	16	3,63
Insufficient skilled human resources for processing.	16	19	22	19	13	2,93
The export process is complicated and time-consuming.	12	18	18	33	8	3,08