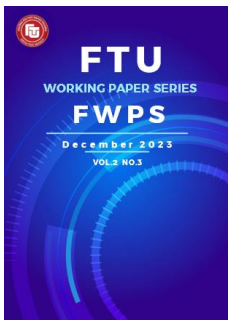

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LOGISTICS CHUỖI CUNG ỨNG LẠNH TẠI VIỆT NAM: TỔNG QUAN VÀ KHUYẾN NGHỊ

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Tóm tắt

Bài nghiên cứu đã xem xét tính biến đổi của chuỗi cung ứng logistics lạnh của Việt Nam, tập trung vào việc giải quyết các thách thức và tận dụng các cơ hội trong ngành đang phát triển nhanh chóng này. Kết quả nghiên cứu chỉ ra logistics chuỗi cung ứng lạnh của Việt Nam đang trên đà tăng trưởng đáng kể, nhờ sự thay đổi trong nhu cầu mua sắm người dân, ưu đãi của chính phủ, và sự tham gia các hiệp định thương mại quốc tế. Tuy nhiên, lĩnh vực này phải đối mặt với những thách thức như cơ sở hạ tầng không đầy đủ, phân phối không đồng đều, hệ thống quản lý vận chuyển và kho bãi không đầy đủ và thiếu chuyên gia hậu cần. Theo kết quả nghiên cứu, để phát huy hết tiềm năng của ngành, nghiên cứu đề xuất cải thiện chất lượng

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nguồn nhân lực, nắm bắt các công nghệ tiên tiến và cải thiện cơ sở hạ tầng.

Từ khoá: logistics lạnh, chuỗi cung ứng lạnh, Việt Nam.

COLD LOGISTICS SUPPLY CHAIN IN VIETNAM: AN OVERVIEW AND RECOMMENDATIONS

Abstract

This study examines the dynamics of Vietnam's cold logistics supply chain, with an emphasis on addressing challenges and capitalizing on opportunities in this rapidly evolving industry. According to the research findings, Vietnam's cold logistics supply chain is on the verge of significant growth, owing primarily to changing domestic consumption patterns, government incentives, and proactive participation in international trade agreements. However, the sector faces challenges such as inadequate infrastructure, uneven distribution, insufficient transportation and warehouse management systems, and a lack of logistics experts. According to the findings, to realize the sector's full potential, the study suggests improving human resource quality, embracing advanced technologies, and improving infrastructure.

Keywords: cold logistics, cold supply chain, Vietnam.

1. Introduction

The logistics industry forms the backbone of any nation's economy, facilitating the efficient and timely movement of goods from their origin to their final destination. Within this industry, the cold chain stands out as a temperature-controlled supply chain critical for preserving the quality and safety of perishable goods like medicines, blood, fresh produce, seafood, and various food products. According to Vietnam Cold Chain Market Report (2023), in recent years, there has been a surge in demand for cold logistics services in Vietnam.

As Vietnam continues to establish itself as a regional and global economic force, the proper management of temperature-sensitive goods becomes a fundamental element in sustaining both domestic and international trade. Consequently, this paper aims to address the growing demands and complexities within the cold logistics industry through a comprehensive analysis and the provision of practical recommendations.

The paper is structured into five key sections. The first section conducts a thorough review of existing literature, setting the basis for our research. In the second section, we describe the qualitative methodology used to collect information on cold chain adoption, which included a literature review and document analysis to ensure a solid research foundation. The third section delves into the theoretical foundations, providing a conceptual framework for our research. In the fourth section, we present and explain our findings, encapsulating the empirical insights gained from our research. In the last section, the paper concludes with a set of practical recommendations aimed at promoting the adoption of cold logistics practices in Vietnam, providing valuable

guidance to stakeholders and decision-makers in the field.

2. Literature Review

2.1. Global Cold Logistics Supply Chain Markets

Cold logistics supply chains comprise some activities that include facilities for keeping products in optimal condition between the point of origin and the point of consumption within a particular temperature range (Tsai & Pawar, 2018). Currently, the usage of the cold logistics supply chain market has increased due to the importance of maintaining optimal temperatures, especially for the postharvest or post-production of temperature-sensitive goods (Ambuko et al., 2018; Bremer, 2018), particularly the increasing need for temperature control to prevent food losses and the rising demand for perishable goods among consumers across the world (Li and Pan, 2021).

Based on its mainstream, the topics of cold chain adoption in the international research communities have become at the forefront, where international researchers are now focusing on the latest technological advancement topics to address the challenges mentioned above. Among these subjects are evaluations of fuzzy technology applications in the agri-supply chain, which covered the problems with inadequate cold storage (Ray et al., 2022). Besides that, Melis et al. (2018) highlighted emerging trends in cold chain monitoring applications, revealing that no modern technology solution could address every issue. Chaudhuri et al. (2018) identified the various forms of data that could be gathered and examined throughout cold chain networks, then supported a real-time quality assessment, determined the product shelf life left, and aid decision-making within the cold logistics supply chains.

2.2. Logistics industry in Vietnam

Logistics is considered one of the important services of the economy in Vietnam, contributing to improving the competitiveness of imports and exports. However, Vietnam’s logistics activities are quite weak and do not develop as expected. As a result, it falls short of its promise in boosting the economy. Research on the impact of logistics on Vietnam's economic development (Nguyen, Luong, and Hoang, 2021) indicates that convenient customs have a negative impact on the country's economy, whereas infrastructure, on-time shipments, and competitive pricing have a very good impact.

According to research (Khoi et al., 2019), we can determine that Vietnam's cold chain is still in its infancy but offers enormous potential for future investment. More specifically, when it comes to cold-chain utilization, the seafood sector seemingly outpaces other sectors in terms of capacity, integrity, and continuity. Furthermore, the rise of fast-food restaurants, high-end food consumption, and domestic modern retail has increased demand for cold services in Vietnam and is thought to be a major driver in accelerating the country's cold chain development over the medium and long terms. Viet Nam hasn't yet created any formal legislation or rules for the cold

chain industry, though. The majority of the time, cold service provisions come from TCVN, post-harvest, food safety, and logistics rules. This would present a number of chances for relevant parties to carry out policy advocacy initiatives in order to establish an all-encompassing policy framework for Vietnam's cold chain.

Besides the huge potential to grow further, it is perceived that the cold logistics in Vietnam are dealing with several challenges. According to Gligor, Tan and Nguyen (2018) when studying about the cold logistics of fruits and vegetables, and milk and dairy products, ten factors that are preventing Vietnam from increasing its use of cold chains include lack of expertise, national-level lack of quality and safety-control measures, supply chain density and complexity, deficient infrastructure, deficiency of information systems, high installation and operation expenses, deficient training at the operational level, deficiency of standardization, lack of government support for local businesses and social norms of an "eating fresh" society. In another research (Bui and Nguyen, 2021), the lack of cold storage facilities, equipment for high-quality refrigerated items in the supply chain, and the use of information technology to provide cold chain services are important obstacles to the growth of the agriculture and fishery sectors.

2.3. Research gap

Based on the preceding discussion and a thorough analysis of the literature, it is deduced that numerous earlier studies have offered thorough analyses of numerous technologies, difficulties, and potential developments in cold chain logistics. However, these reviews focus on specific technologies (Zhao et al., 2016), a single link in the cold chain (Brosnan & Sun, 2001; Duan et al., 2020), or a specific research topic (Ndraha et al., 2018), whereas few studies provide a comprehensive review of the field (i.e., its research priorities, the current state of research, future challenges and trends). Particularly, research into the cold logistics overview in the Vietnamese context is limited, with not many studies being conducted to thoroughly assess both the opportunities and challenges of Vietnam cold logistics, as well as proposing and ensuring its development from the perspective of the government, logistics providers and manufacturers. Devoted to bridging the gap of the existing literature, one of the study's innovations is its recommendations for the government, logistics providers and manufacturers to enhance the performance and boost the growth of Vietnam cold chain logistics after analyzing its context, opportunities and challenges.

3. Theoretical background

3.1. Concept of Cold Logistics Supply Chain

Cold logistics supply chains is a popular and age-old concept, especially among countries with developed agriculture industries. It is defined as a series of operations comprising facilities for

maintaining the ideal conditions of goods within a specific temperature range from the point of origin to the point of consumption (Tsai & Pawar, 2018).

Nowadays, along with the development of new technology and the huge increasing demand on the products of temperature-controlled industries, the cold logistics supply chain is increasingly associated with innovative machinery and equipment. Some commonly used methods include: gel packs, dry ice, liquid nitrogen, eutectic plates, reefers, quilts, etc. Whichever method being applied relies on three factors: the transport duration, the size of the shipment, and seasonality.

3.2. Components constituting Cold Logistics Supply Chain

According to Rodrigue and Notteboom (2016), cold logistics supply chain is a science, a technology and a process. The deep comprehension of the biological and chemical mechanisms behind perishability makes it a science. The system of cold logistics supply chain has many elements, including:

- **Cooling systems:** The system that brings commodities temperature for processing, storage, and transportation.
- **Cold storage**: Facilities for the storage of goods and products over a period of time, either waiting to be transported or to be distributed.
- **Cold transport:** Having vehicles that can transfer goods while preserving consistent humidity and temperature levels as well as integrity.
- **Cold processing:** Providing facilities for processing goods while ensuring sanitary conditions.
- **Cold distribution:** Dealing with loading and unloading goods from crates, boxes, pallets,...

3.3. Role of Cold Logistics Supply Chain

According to research (Nguyen et al., 2022), the cold logistics supply chain plays a vital role in the distribution and pricing of business products. The primary role of the cold logistics supply chain is to maintain the integrity and quality of temperature-sensitive products, including perishable goods that require specific temperature conditions to prevent spoilage, degradation, or loss of efficacy. Real-time monitoring of temperature and environmental conditions allows for proactive interventions, hence ensuring compliance with quality standards and helping consumers receive fresh and safe products, even when they are transported over long distances (Gillespie et al., 2023).

In terms of different sectors, the roles that the cold logistics supply chain plays vary depending on the various sectors. In the pharmaceutical and healthcare sectors, the cold logistics supply chain is indispensable for transporting vaccines, blood products, and medicines that require strict temperature control. In this industry, it is necessary to know and analyze every step of the cold

supply chain to provide the most appropriate and safe cooling level (Turan, C. and Ozturkoglu, Y., 2022). Failure to maintain the cold chain can lead to the loss of potency and compromised efficacy, posing a risk to public health (Soğuk et al., 2021). Meanwhile, in the food sector, effective cold chain management minimizes food waste by preventing spoilage, extending shelf life, and reducing post-harvest losses, particularly in regions where food scarcity and hunger prevail, as it allows for the efficient distribution of food resources (Zhao et al., 2018).

3.4. Factors affecting the development of cold logistics supply chain

Interiorly, the cold chain system is the consolidation of three major elements, which must all combine to ensure safe transportation and storage activities, hence ensure a successful cold chain (Feyisa et al., 2021):

- Well-trained personnel, who operate and maintain the machinery.
- Equipment for temperature monitoring and dependable storage.
- Precise procedures to manage and control the whole process (especially medications' inventory management)

Furthermore, there are exterior elements that considerably affect cold chain logistics industry:

Socio-economic context: the rapidly growing regional economic level can provide a good platform for the development of the logistics industry in the region and play a huge role in promoting the upstream and downstream industries of the logistics supply chain (Li and Chen, 2021).

Infrastructure: The operation and development of the supply chain depends a lot on the infrastructure of the industry and the nation (Binh, 2022). A smooth traffic infrastructure system is important as it reduces transportation time in the supply chain.

Information technology: Advancements in IT, namely data analytics, cloud computing, and Internet of Things (IoT) enable real-time tracking, remote temperature monitoring, and proactive management of cold chain operations. These advancements enhance efficiency, reduce risks, and ensure product integrity of the products.

Last but not least, **standardization**: when the government successfully develops standards and regulations from cold processing stages to packaging, cold storage, cold transportation and distribution, the whole chain will be synchronized, thereby positively impacting product quality.

4. Methodology

4.1. Document Analysis

This research paper will apply secondary data collection and analysis method to provide a most comprehensive overview and recommendations for cold logistics supply chain in Vietnam for the following reasons:

Firstly, primary data collection in the logistics industry can be costly, particularly when it involves extensive fieldwork and data gathering from multiple supply chain nodes. The major advantages associated with secondary analysis are the cost effectiveness and convenience it provides (Ramos et al., 2021). Due to the lack of resources and limited time within the course's duration, we choose to use secondary data to focus resources more on analysis and brainstorming.

Secondly, hence the overview of this area has not been exclusively synthesized, a qualitative method using secondary data collection is deemed appropriate. Systematic data aggregation, integration and interpretation can help provide a more comprehensive and holistic view of the industry, then, generate new insights and understandings (Saini and Slonsky, 2012), or suggest recommendations in this research context.

4.2. Research Design

The purpose of this research is to address the cold chain logistics industry in Vietnam, which is experiencing growing demands and complexities. From that point, the most general perspectives are provided along with practical recommendations for the market.

To meet these objectives, our team conducted reviews on available documents (both in English and Vietnamese) about cold supply chain, logistics industry specifically in Vietnam, data collection is carried as below:

- **Database**: list of government regulations, industry reports, journals and prestigious academic research published on Google scholar, science.gov, ...
- **Publish duration**: all the above materials are published or effective between 2000 and 2023 and they are collected in November 2023.
- **Research question:** What is the significance of analyzing the comprehensive overview of Vietnam's cold chain logistics industry in providing practical suggestions for its own market?
- **Search syntax:** cold logistic, cold chain, logistics Vietnam, kho lạnh. With this search syntax, our team has reached quite a large number of articles mentioning the above keywords.

After synthesizing the database relating to research objectives, our team applied the analysis method as the qualitative method introduced by Bowen (2009) to build a complete picture of Vietnam's cold logistics supply chain, then provide sensible recommendations. This method means mainly using documents as data sources. Then, analysis involves skimming (superficial examination), reading (thorough examination), and interpretation. This iterative process combines elements of content analysis (organizing information into categories related to the central questions

of the research) and thematic analysis (a form of pattern recognition within the data, with emerging themes becoming the categories for analysis).

5. The Cold Logistics Supply Chain in Vietnam

5.1. Current situation of cold logistics supply chain in Vietnam

5.1.1. Market Demand

The pronounced surge in the demand for cold chain services in Vietnam is primarily attributed to several factors: Vietnam's robust position as an exporter of seafood and agricultural commodities; emerging domestic commercial and consumption patterns such as online food procurement, the adoption of imported and organic foods, as well as the proliferation of franchised retail establishments, and the heightened need for efficient vaccine distribution and the transportation of pharmaceuticals and biologically-derived products.

- **The export growth of Vietnam's seafood and agricultural products**

Perishable commodities such as seafood, fruits and vegetables, and meat generate a significant need for refrigerated services, with seafood assuming a preeminent position in this demand (Nomura Research Institute, 2016). In October 2023, the exports of agricultural, forestry, and aquatic products are anticipated to attain a total value of 4.81 billion USD, reflecting a 7.43% increase when compared to the preceding month and an 11.9% surge in contrast to the corresponding period in October 2022.

Unit: USD

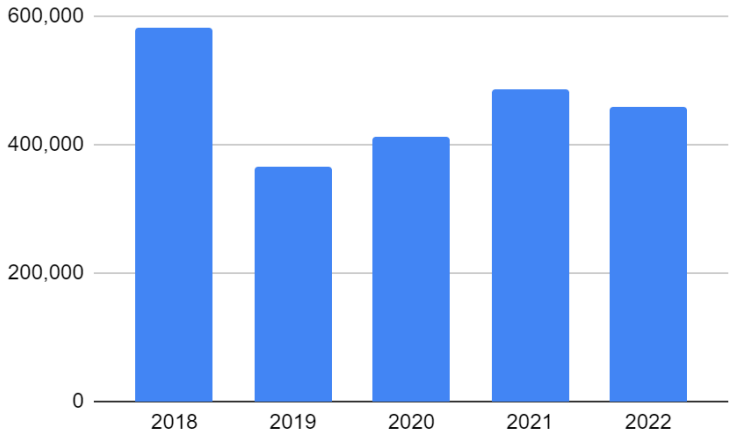
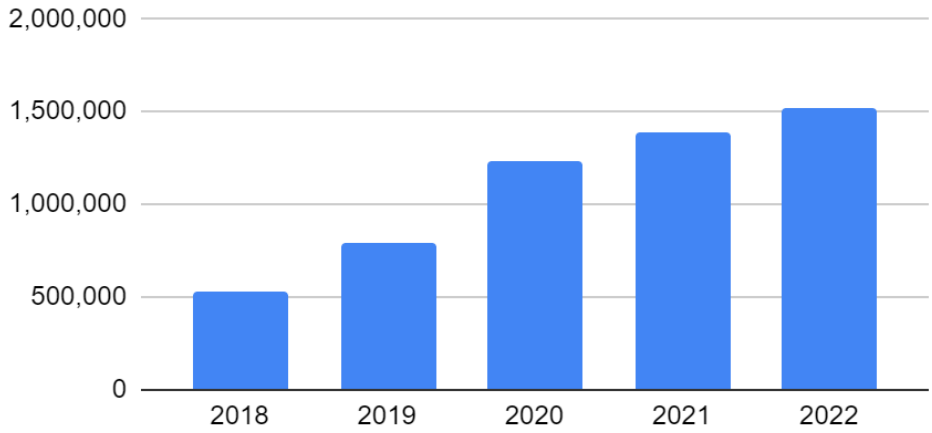


Figure 1: Vietnam's vegetables export figures (2018 - 2022)

***Source**: Trade Map, 2023*

- **The adoption of imported and organic foods**

Factors such as urbanization, rising incomes, and heightened concerns regarding food safety have also accelerated the nation's meat imports for domestic consumption. In 2017, frozen bovine products, frozen cuts of meat, and edible offal from poultry collectively accounted for more than 75% of the overall imported meat value (Khoi et al, 2019). During the period from 2018 to 2021, there has been substantial increase in the meat import of Vietnam, indicating a positive trend in the adoption of imported meat in Vietnam's market.



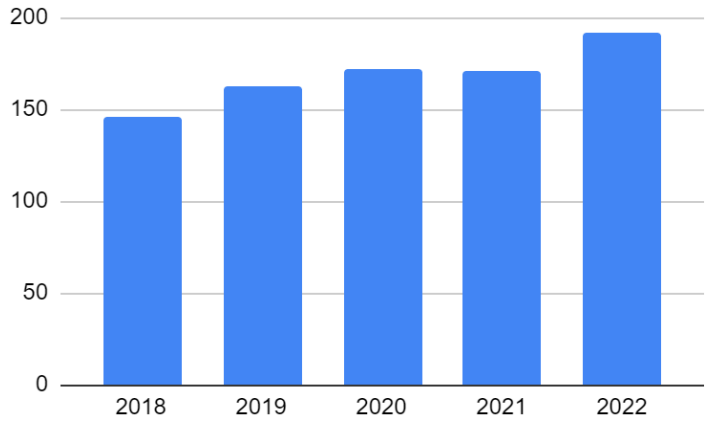
(Unit: USD)

Figure 2: Vietnam's meat import figures (2018 - 2022)

***Source**: Trade Map, 2023*

- **The expansion of retail establishments and fast-food chains.**

In major metropolitan areas, the existence of large-scale shopping centers like Vincom, AEON... in conjunction with contemporary residential complexes equipped with dining facilities and the continuous growth of fast-food franchises collectively foster an augmented requirement for cold chain logistics. The fast-food sector significantly relies on Vietnam's cold chain infrastructure, commanding a notable 35% market share within the food-service industry, with a particular emphasis on imported beef and chicken meat cuts (Khoi et al, 2019)



(Unit: USD billion)

Figure 3: Vietnam's total retail sales (2018 - 2022)

***Source**: USDA, 2023*

- **The increased consumption of vaccination and pharmaceutical commodities**

The strong demand for cold storage can also be greatly driven by strong demand for vaccines. As a result of Covid-19 epidemic, the vaccine consumption increased the need for temperature-controlled logistics, as vaccines need to be stored at low temperatures (VietDaily, 2020). The pharmaceutical sector in Vietnam generated a revenue of 142.9 trillion VND in 2021, and this figure is projected to ascend to 155.8 trillion VND in 2022, with further growth anticipated to culminate at 216.4 trillion VND by the year 2026 (Vietstock, 2023).

5.1.2. Cold transportation

According to Fiin Research (2019), in 2018, there were more than 700 refrigerated trucks (bulk) and it is predicted to remain the growth momentum in the coming future. According to the Vietnam Association for Logistics Manpower Development (2022), Vietnam's refrigerated transport market is currently quite fragmented, with few large enterprises and many small transporters, with many different transport routes due to demand-side characteristics. In addition, improper harvesting, packaging, preservation, and inconsistent transportation stages lead to uneven product quality (Nguyen, 2018).

The cold transportation modes in Vietnam include air, road, rail and sea transportation. For air transportation, it needs to use reefer containers, however, there are few flights that only transport goods, but are often combined with passenger flights, so they depend on passenger demand and are expensive (Nguyen, 2018).

For road transportation, it is mainly used for domestic cold transportation, however, the refrigerated vehicle system that ensures cold transportation is still very limited, mainly transported

by refrigerated containers, but only a few large businesses or supermarkets can equip and use this refrigerated transportation system.

For rail transportation, railway reefer was first operated at the end of 2017 on the route from Nanning to Vietnam to transport fruit, using a new technology reefer container that independently generates electricity at each container.

For sea transportation, it is widely used since it may be more economical and is an important mode of transportation for fruits, vegetables, dairy products, meats, and fish products that are produced distant from markets and whose shelf life outlasts the duration of the trip. It can be seen that reefer containers are widely used in different modes in cold transportation.

In terms of technology, businesses in the market have not yet applied many transportation management systems throughout the entire system to retrieve information from the warehouse to the end point of the transportation process, but only stop in the application of GPS positioning technology (Vietnam Association for Logistics Manpower Development, 2022).

5.1.3. Cold warehouse

The South of Vietnam accounts for about 60% of cold warehouses. The primary economic triangle of the region, Ho Chi Minh City, Binh Duong, and Dong Nai, is home to the majority of Vietnam's cold storage facilities (Bui and Nguyen, 2021). This comes from the fact that the South is where most food factories are located, and is also where aquatic products are grown and processed for export.

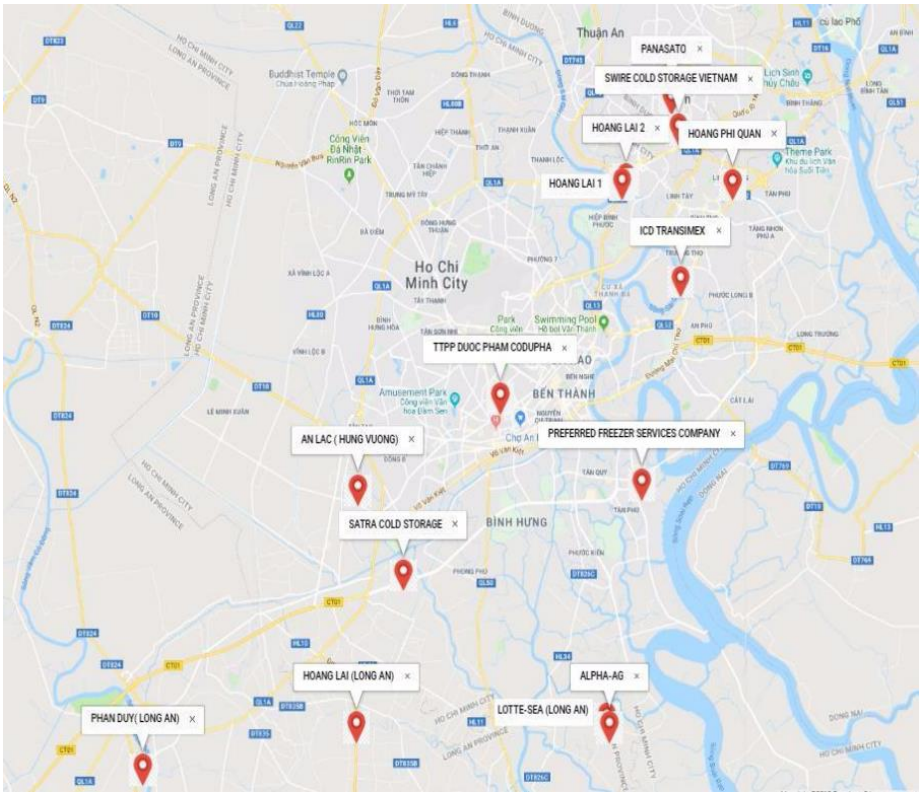


Figure 4. Cold warehouses of the southern region

Source: Vietnam's Cold Chain Logistics in the Industrial Revolution 4.0: the Effects and Solutions (Bui and Nguyen, 2021)

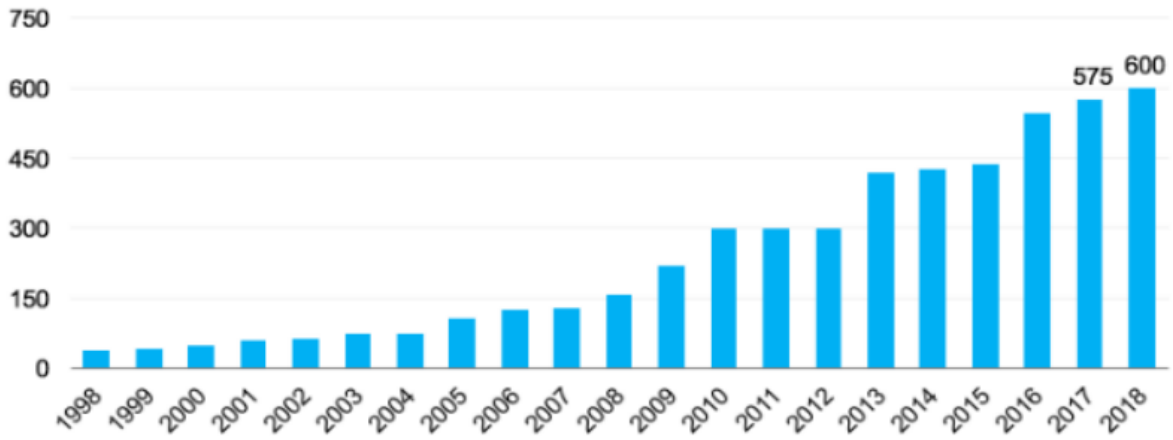


Figure 5. Cold storage capacity for rent in Vietnam (thousands of pallets)

***Source**: Fiin Research, 2019*

Most cold warehouses are quite outdated (no shelves, lack of temperature control centers, manual-based process). Tools mainly used in cold warehouses include plastic pallets, inverter

pallets, moving freezers, and water heaters. (Bui and Nguyen, 2021). In terms of cooling technology, most cold warehouses in Vietnam are applying three main traditional technologies to store food, namely static cooling, dynamic cooling and spray cooling. In static cooling, the cooling speed is slow, the cold air in the room is natural convection, and no additional ventilation fans are equipped other than the basic indoor unit.

To overcome the above limitation, besides the traditional technologies, Vietnam is conducting research to apply modern technology to increase the performance of cold warehouses. A prominent technology that has been recently developed can be CAS (Cells Alive System). CAS is a modern frozen food preservation technology of ABI Corporation (Japan) which was transferred to Vietnam in June 2013. However, the CAS has not been widely applied in most warehouses because of high initial investment costs.

Concerning warehouse management technology, most large businesses have applied technology in operations through deploying cold storage management software or automating operations. However, small businesses have only applied very simple software and have not yet automated it. Nowadays, Vietnamese companies are switching to modern management technology. Technologies applied at leading businesses in Vietnam such as Emergent cold, PFS, Lotte include dividing warehouse functions into cold storage, cool storage, barcode, inventory management system, value-added service classification, labeling, distribution.

5.2. Opportunities and Challenges of Cold Logistics Supply Chain in Vietnam

5.2.1. Opportunities of Cold Logistics Supply Chain in Vietnam

Firstly, Vietnam is one of the few countries in the world that are considered to have great potential in exporting products in cold-chain logistics markets, such as fruits and vegetables, due to its favorable climate (Binh, 2022).

Secondly, the rising demand and the undeveloped cold chain system in Vietnam have created great opportunities for investors in this sector. Following Minh Huong (2021), Vietnam has gained a lot of interest from foreign investors in developing cold storage facilities in Vietnam. Large corporations, enterprises, and even foreign investment funds have also stepped up to invest in the construction of cold storage and warehouses for export.

Thirdly, the Government has been promoting the development of cold chains through diverse incentive investment policies and preferential programs. For example, with Decision No. 63/2010/QD-TTg, cold storage construction enterprises are eligible to apply for development investment credit interest rate and free land rent along with receiving 20% support for site clearance and 30% for technical infrastructure completion outside the investment fence (Article 3, Decision No. 63/2010/QD-TTg).

At the same time, Vietnam’s proactive participation in Free Trade Agreements (FTA) is a great opportunity and a driving force for developing Vietnam's cold chain logistics. New-generation

FTA, namely EVFTA, CPTPP, and UKVFTA, will stimulate export demand for agricultural and aquatic products to fastidious European markets and increase demand for cold storage systems. The EVFTA, for example, has been contributing mainly to the expansion, as the EU is a major importer of Vietnamese seafood (23%).

5.2.2. Challenges of Cold Logistics Supply Chain in Vietnam

Vietnam's cold logistics supply chain system currently faces several challenges. The first is that demand for the cold logistics supply chain is outstripping the system's entire storage and cooling capacity (Vietnam News, 2018). There was a shortage of cold logistics facilities due to the simultaneous rise in high demand for cold supply chains.

In addition to the overall facilities deficits, insufficient and uneven technological levels provide significant barriers to developing the cold logistics supply chain. Vietnam's cold supply chain still lacks adequate infrastructure for cold storage and transportation, making it challenging to implement current technology comprehensively (Nguyen, 2018). Transportation management systems (TMS) and warehouse management systems (WMS) are still in short use.

Moreover, stricter safety and health standards for cold logistics supply chains are brought about by the properties of products kept in a cold environment. It complicates the cold storage license and regulatory framework, particularly for new investors in the market.

Human resources present another big obstacle because skilled logistics personnel are still in short supply. According to VIFFAS (Vietnam Freight Forwarding Association), the labor supply for the logistics and supply chain management industry only meets about 40% of the actual demand, especially the need for more high-quality human resources (Nguyen, 2018).

Finally, most enterprises operating in the domestic cold logistics supply chain market are now small and scattered, offering only localized services but not for the entire food supply chain and lacking high-value system activities.

6. Recommendation

6.1. Increase support and investment in the cold logistics market

The biggest barrier to investing in this industry in Vietnam is policy as there is no policy to encourage investment (Duy Anh, 2022). Tax support from the government and loan interest rate reduction from banks are good measures that might bring opportunities for parties in the sector. The government can consider offering tax credits or subsidies to companies that invest in energy-efficient and eco-friendly cold storage facilities and transportation systems. These incentives could help businesses reduce operational costs and minimize their environmental footprint, contributing to long-term sustainability.

6.2. Improve facilities infrastructure and availability of cold logistics in regions

Enhancing cold logistics infrastructure and availability of facilities in various regions requires a concerted effort from various parties. Government should prioritize funding for the construction and maintenance of cold storage facilities and cold chain transportation networks. The authority needs to concentrate on expanding the utilities and roadway networks in order to provide chances for the development of cold supply chains. For enterprises, they should focus on expending cold storage warehouses and transport vehicles near the production and consumption areas that are in higher demand, as well as near the ports and airports that facilitates international trade. This can help reduce the congestion and improve the service quality of cold logistics.

6.3. Improve the technology infrastructure

Information technology in the chain will ensure that the information is accurate and detailed, enable to provide data in real time as well as the safety of goods flow by ensuring the maintenance the proper temperature continuously within the whole chain, especially for smaller enterprises, which only use simple software and have not had proper management process. The transportation management systems (TMS), ware house management systems (WMS), or GPS (global positioning systems) should be applied widely. The research of Bigaj Z., Koliński A. (2017) on the implementation of mobile technologies to improve the monitoring process of the continuity of goods flow and to allow the monitoring in real time, using RFID and VFC, has shown the efficiency of the concept.

6.4. Improve the quality of labour

Vietnam's logistics workforce is facing a labour shortage and an efficient operating process in SMEs due to a lack of specialized professionals and skilled professionals. The industry is primarily trained in foreign trade and international relations, resulting in limited availability of high-quality labour. The government and authorities should focus on supporting universities and educational institutions to form a technical faculty, particularly logistics experts, to meet logistics development demands..

7. Conclusion

Vietnam’s cold logistics supply chain market is expected to grow due to government incentives, emerging domestic consumption trends, and proactive participation in international trade agreements. However, the market faces challenges such as shortage and uneven distribution of infrastructure, insufficient transportation and warehouse management systems, and a shortage of logistics experts. The purpose of this paper is to offer insights that cater to stakeholders, policymakers, and industry professionals to unlock the full potential of this sector.

Through a methodological approach and valuable materials, we made several recommendations about upgrading human resources’ quality, embracing advanced technologies and enhancing infrastructure. It is important to note that improving the cold logistics supply chain in Vietnam requires collaborative efforts from the government, logistics providers, and

manufacturers, as you mentioned. By working together, they can develop and implement effective solutions that address the challenges faced by the industry.

Further analysis with comprehensive methods will be required to provide a more specific and practical approach. This is only the starting point for defining the path for Vietnam to harness the promise of its cold logistics supply chain, thereby contributing to economic growth and improving the quality of life for its citizens.

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