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CONTENTS

Page

- **Nguyen The Hung, Nguyen Van Quang, Le Sy Hung, Nguyen Thi Thuy Chung, Bui Thu Uyen.** The effects of different nutrient solutions on the growth of basil (*Ocimum basilicum* L.) cultivated under the conditions of green houses **3-10**
- **Bui Thi Thu Huong, Dong Huy Gioi.** Effects of some elements on the growth, and the development of banana shoots (*M. acuminata*) in microponic system **11-16**
- **Pham Trung Thanh, Tran Thi Hong Van, Nguyen Nhu Ngoc, Vu Kim Dung.** Optimizing the extraction conditions and antibacterial activities of saponin from *Celastrus hindsii* Benth. **17-25**
- **Nguyen Hong Hai, Vi Viet Duc.** Analyzing of spatial structure characteristics of tropical evergreen forest stands under environmental heterogeneity **26-35**
- **Cao Thi Thu Hien, Nguyen Hong Hai, Nguyen Phuc Truong.** Fitting diameter distributions of tropical rainforests in Vietnam by five probability functions **36-43**
- **Nguyen Van Hop, Bui Manh Hung, Huynh Quoc Trong.** Diversity of lauraceae family in Hon Ba Nature Reserve, Khanh Hoa province **44-52**
- **Keovilay Chanthalaphone, Bui The Doi, Le Xuan Truong, Nguyen Van Tu.** Structural characteristics and plant species diversity of some natural foerst types at Phou Khao Khouay National Park, Lao People's Democratic Republic **53-63**
- **Bui Van Bac.** Checklist of tunnelling dung beetles (Coleoptera: Scarabaeidae) in Lai Chau province with the first report of new provincial records **64-72**
- **Nguyen Thi Ngoc Bich, Nguyen Van Chung, Thai Thi Thuy An, Le Phu Tuan, Le Van Vuong, Vu Thi Kim Oanh.** Study on the potential to absorb heavy metal (fe, cu, mn) in contaminated water by *Centella asiatica* **73-79**
- **Bui Xuan Dung, Do Thi Kim Thanh, Kieu Thuy Quynh, Do Thi Thu Phuc.** Seasonal variation of groundwater level and quality in Xuan Mai, Hanoi, Vietnam **80-90**
- **Tran Thi Huong, Nguyen Thi Bich Hao, Thai Thi Thuy An, Nguyen Thi Ngoc Bich, Kieu Thanh Thuy.** Solutions to reduce water pollution at metal craft village of Thanh Thuy commune, Thanh Oai district, Hanoi city **91-102**
- **Nguyen Dac Manh, Tran Van Dung, Vu Tien Thinh.** The competition between Macaques and cao vit Gibbon in Trung Khanh Species & Habitat Conservation Area, Cao Bang province **103-112**
- **Phung Van Phe, Phung Thi Tuyen, Nguyen Duc To Luu, Nguyen Van Thanh.** Flora diversity in Thac Tien – Deo Gio Natural Forest of Xin Man district, Ha Giang province **113-120**
- **Duong Van Doan, Tran Thi Thu Ha, Duong Thi Kim Hue, Trieu Thi Yen, Nguyen Duc Thanh.** Variations in wood density and mechanical properties of *Manglietia conifera* Dandy planted in Na Ri, Bac Kan **121-126**
- **Hoang Tien Duong.** Reasearch to propose some technological parameters when slicing *Betula alnoides* wood **127-135**
- **Tang Thi Kim Hong, Nguyen Duy Linh.** Investigation on producing single-layer particleboard from bamboo waste and cocoa pod husks **136-141**
- **Nguyen Thuy Dung, Nguyen Thi Thu Nga.** Factors influence the consumer's online shopping behavior on cosmetic at Pizu Ltd Company **142-149**
- **Nguyen Thi Thanh Huyen, Nguyen Thi Anh Van.** An oveview of fruit and vegetable supply chain model in Hanoi **150-158**
- **Ho Van Hoa, Pham Thanh Que, Pham Huyen Phuong, Nguyen Thi Hai, Tran Thu Ha.** Factors affecting workers' satisfaction with human resource management at Hai Phat Real Estate Joint Stock Company, Hanoi **159-166**

Tạp chí:

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NĂM THỨ CHÍN

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MỤC LỤC

	Trang
▪ Nguyễn Thế Hùng, Nguyễn Văn Quảng, Lê Sỹ Hưng, Nguyễn Thị Thủy Chung, Bùi Thu Uyên. Loại dung dịch dinh dưỡng khác nhau ảnh hưởng tới sinh trưởng, phát triển của cây rau Húng quế (<i>Ocimum basilicum</i> L.) bằng phương pháp thủy canh trong điều kiện nhà màng	3-10
▪ Bùi Thị Thu Hương, Đồng Huy Giới. Ảnh hưởng của một số yếu tố đến sinh trưởng, phát triển của chồi chồi Tiêu Hồng trong điều kiện vi thủy canh	11-16
▪ Phạm Trung Thành, Trần Thị Hồng Vân, Nguyễn Như Ngọc, Vũ Kim Dung. Tối ưu điều kiện chiết xuất và hoạt tính kháng khuẩn của saponin từ lá Xạ đen (<i>Celastrus hindsii</i> Benth.)	17-25
▪ Nguyễn Hồng Hải, Vi Việt Đức. Phân tích đặc điểm cấu trúc không gian của rừng nhiệt đới thường xanh trong điều kiện môi trường sống không đồng nhất	26-35
▪ Cao Thị Thu Hiền, Nguyễn Hồng Hải, Nguyễn Phúc Trường. Mô phỏng phân bố đường kính của rừng mưa nhiệt đới ở Việt Nam theo năm hàm xác suất	36-43
▪ Nguyễn Văn Hợp, Bùi Mạnh Hưng, Huỳnh Quốc Trọng. Đa dạng họ Long não (Lauraceae) tại Khu bảo tồn thiên nhiên Hòn Bà, tỉnh Khánh Hòa	44-52
▪ Keovilay Chanthaphone, Bùi Thế Đồi, Lê Xuân Trường, Nguyễn Văn Tứ. Đa dạng thực vật và đặc trưng cấu trúc một số trạng thái rừng tự nhiên Vườn quốc gia Phou Khao Khouay, Cộng hòa dân chủ nhân dân Lào	53-63
▪ Bùi Văn Bắc. Danh lục các loài bộ hung đào hang (coleoptera: scarabaeidae) tại tỉnh Lai Châu cùng với báo cáo đầu tiên về những loài được ghi nhận mới tại khu vực	64-72
▪ Nguyễn Thị Ngọc Bích, Nguyễn Văn Chung, Thái Thị Thúy An, Lê Phú Tuấn, Lê Văn Vương, Vũ Thị Kim Oanh. Nghiên cứu khả năng hấp thụ kim loại (fe, cu, mn) trong nước của cây Rau má (<i>Centella asiatica</i>)	73-79
▪ Bùi Xuân Dũng, Đỗ Thị Kim Thanh, Kiều Thúy Quỳnh, Đỗ Thị Thu Phúc. Biến động theo mùa của mực nước và chất lượng nước ngầm tại Xuân Mai, Hà Nội, Việt Nam	80-90
▪ Trần Thị Hương, Nguyễn Thị Bích Hảo, Thái Thị Thúy An, Nguyễn Thị Ngọc Bích, Kiều Thanh Thủy. Đề xuất giải pháp giảm thiểu ô nhiễm nước tại làng nghề kim cơ khí xã Thanh Thủy, huyện Thanh Oai, thành phố Hà Nội	91-102
▪ Nguyễn Đắc Mạnh, Trần Văn Dũng, Vũ Tiến Thịnh. Cạnh tranh giữa các loài Khỉ và Vượn cao vút tại Khu bảo tồn loài và sinh cảnh Trùng Khánh, tỉnh Cao Bằng	103-112
▪ Phùng Văn Phê, Phùng Thị Tuyền, Nguyễn Đức Tổ Lưu, Nguyễn Văn Thanh. Tính đa dạng hệ thực vật ở Khu rừng tự nhiên Thác Tiên – Đèo Gió, huyện Xín Mần, tỉnh Hà Giang	113-120
▪ Dương Văn Đoàn, Trần Thị Thu Hà, Dương Thị Kim Huệ, Triệu Thị Yến, Nguyễn Đức Thành. Những biến đổi khối lượng thể tích và tính chất cơ học trong thân cây gỗ Mỡ (<i>Manglietia conifera</i> Dandy) trồng tại huyện Na Rì, tỉnh Bắc Kạn	121-126
▪ Hoàng Tiến Đượg. Nghiên cứu đề xuất một số thông số công nghệ khi lạng gỗ Xoan đào	127-135
▪ Tăng Thị Kim Hồng, Nguyễn Duy Linh. Nghiên cứu sản xuất ván dăm một lớp từ phế liệu tre và vỏ quả Ca cao	136-141
▪ Nguyễn Thùy Dung, Nguyễn Thị Thu Nga. Áp dụng phương pháp phân tích nhân tố khám phá trong nghiên cứu các yếu tố ảnh hưởng đến hành vi mua mỹ phẩm trực tuyến tại Công ty TNHH Pizu	142-149
▪ Nguyễn Thị Thanh Huyền, Nguyễn Thị Ánh Vân. Tổng quan về các mô hình chuỗi cung ứng rau quả Hà Nội	150-158
▪ Hồ Văn Hóa, Phạm Thanh Quế, Phạm Huyền Phương, Nguyễn Thị Hải, Trần Thu Hà. Một số nhân tố ảnh hưởng đến sự hài lòng của người lao động với công tác quản trị nguồn nhân lực tại Công ty cổ phần bất động sản Hải Phát	159-166

AN OVEVIEW OF FRUIT AND VEGETABLE SUPPLY CHAIN MODEL IN HANOI

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SUMMARY

There are models of fruit and vegetable supply chains in Hanoi: Chain of participants, chain of wholesaler Mega Market, chain of retailers; Vineco closed chain and Sharefarm share chain. The model of the supply chain of vegetables and fruits by members (i.e. chains without leadering members) has many advantages: meeting up to 90% consumption of the market, a rich variety of fruits and vegetables, a wide distribution channels, throughout and affordable prices... but the quality and food safety are still inadequate. The other chain models have advantages: product quality and food safety are initially paid attention, but high prices; limited types, and the distribution channels are mainly in urban areas... During the operation, the models of fruit and vegetable supply chains have also faced many certain difficulties: (1) Compliance with commitments on quality and food safety is not serious; (2) Traditional market system has many weaknesses in management; (3) Chains lack monitoring mechanisms; (4) The dissemination and application of traceability code system (QR) is too slow... In order to increase the added value and increase the sustainability of the chains of chain leaders and industry managers, there must be a change in orientation, reorganization, and strengthening of monitoring mechanisms. string to suit living conditions and new requirements for quality standards.

Keywords: Fruits and vegetables, operating organization, structure, supply chain model.

1. INTRODUCTION

Up to now, world-famous experts in the field of chain economics have studied and published many basic theories on supply chains and value chains (Alam M. C. and Supriana T., 2015) (Chopra S. and Meindl P., 2009) (Hugos Michael H., 2010). However, the theory of supply chain model is still fragmented in Vietnam, because the theory of chains is mainly inherited from the world's ones. Vietnamese managers have been taking them as a basis to apply and develop chains in the real conditions.

In practical terms, in Vietnam in general and at Hanoi in particular, the research is just limited to describe or solve each individual problem in the fruit and vegetable supply chain, such as production, technology, and consumption according to participants, which means that the chain model has no leadering members. The studies have not generalized the existing models in Hanoi yet. At the same time, new modern supply chain models (with leading members) such as retail chains, VinEco closed

chains, Sharefarm chains being extremely promoted by market conditions and social situations are left open, which makes the solutions for chain development are asynchronous and ineffective. In Hanoi, the practical chain development is one step ahead of the theory. Therefore, to generalize the current models of the fruit and vegetable supply chain is necessary.

2. RESEARCH METHODOLOGY

2.1. Research content

The article includes:

- Theoretical bases of supply chain model;
- Practical bases of fruit and vegetable supply chain models in Hanoi, including:
 - + Structure and operating mechanism of chain models;
 - + The result of added value of chain models;
 - + Assessments of the market share, results and limitations of the supply chain models.

2.2. Research methods

The article is a part of the author's doctoral research results series. The author have used the

following research methods:

Data collection method

The secondary data is collected and analyzed as an overview of the F&V industry in Hanoi. These documents include: reports of state management agencies (Department of Agriculture and Rural Development in Hanoi, Hanoi Statistics Office), research papers, master theses.

The primary data: to conduct a random and direct interview producers, traders and consumers in the field of vegetables and fruits in Hanoi. After that, the collected information is verified by some staffs working in the local farmers associations, management boards of markets and supermarkets... in Hanoi.

Data analyzation method

Chain analysis methodology has been applied to identify the agents participated in the chain (from input supply to production, productive process, collection, preliminary treatment and marketing) and analysis of products' flow from manufacturing to

consumption across different channels. Besides the study applies descriptive statistical methods, cost-revenue analysis, economic analysis of the chain, value-added analysis for each stage and for the whole value chain of several main product channels.

3. RESULTS AND DISCUSSIONS

3.1. Theoretical basis of supply chain model

3.1.1. Concepts of supply chain and supply chain model

The concept of supply chain: According to Chopra S. and Meindl P. (2009): "Supply chain is a collection of three or more businesses, directly or indirectly connected by one or more flows of products, information and finance in the process of meeting customer requirements" (Alam M C and Supriana T., 2015). The term "supply chain" evokes the image of products/ services moving from supplier to manufacturer, through distributor to consumers along a supply chain. In which, physical flows, information flows, financial flows and trade flows run along both directions in the chain.

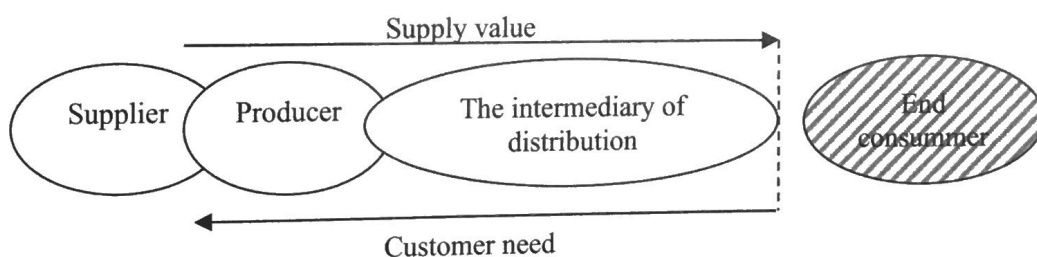


Figure 1. General agricultural supply chain model

(Source: Alam M. C. and Supriana T., 2015)

The concept of supply chain model: Based on the concept of "model" by Hoang Phe (Hoang Phe et al., 2015), the author suggests a concept of supply chain model as follows: "Supply chain model is a structure, internal form of an organization, an arrangement and connection between members. Expression of the supply chain model is diagrams, images indicating the connection and activities of the

members in the chain. Structure of supply chain reflects the length and width of the chain; members' participation and connection between the members in the chain".

3.1.2. Classification of supply chain models

Supply chain model by the participants in the chain: According to Hugos Michael H. (Hugos Michael H., 2010), a supply chain is organized in two basic configurations:

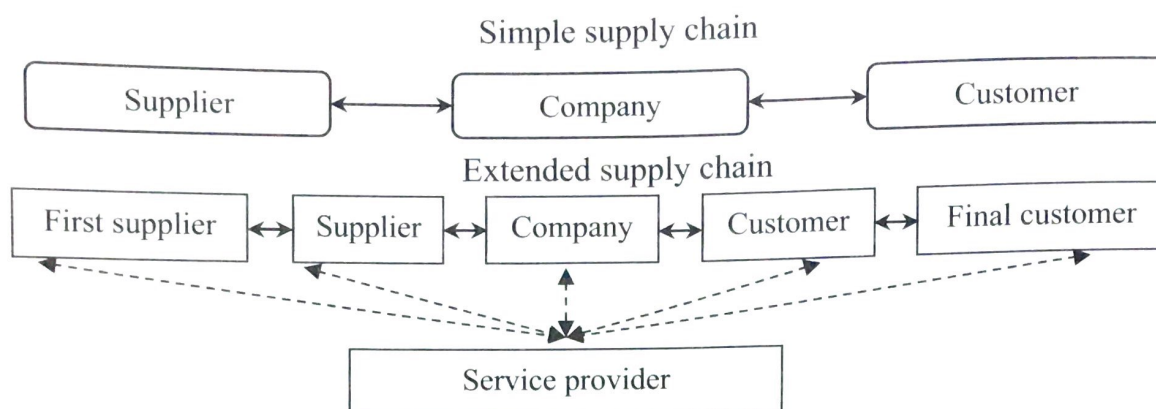


Figure 2. Supply chain model by participant

(Source: Hugos Michael H., 2010)

Supply chain model leaded by participants: According to Dinh Van Thanh (Dinh Van Thanh, 2010), based on the member who plays the leading and coordinating role, supply chains has three types:

(1) Supply chains leaded by suppliers: In order to play a leading and coordinating role of the supply chain, supplier is required to be a major supplier, a raw material supply market has few participants or the supplied material has unique characteristics that other suppliers have not. There is no supplier who has capacity for this role in Hanoi.

(2) Supply chains leaded by Manufacturers: In these supply chains, producers will play a central role in connecting, operating and coordinating all activities from supply, production, and distribution. They will take the initiative in the connecting process by decision to conclude and how to coordinate. Currently, there is no chain of this type, because the manufacturers are not capable enough to lead

the chain.

(3) Supply chains leaded by wholesale/retailer: In order to implement their fulfill leading and coordinating role, these intermediaries must actively study the market carefully and offer decision about product design, price, proactively conduct agreements with different manufacturers and traders. In Hanoi, representing this sub-group is a supply chain model led and coordinated by retailer.

Integrating all of the above classifications, recently, there are VinEco closed chain and Sharefarm chain representing for this group in Hanoi. However, the output and market share of these two chains are still quite small.

3.2. Situation of fruit and vegetable supply chain models in Hanoi

3.2.1. Structure and operating mechanism of the fruit and vegetable supply chain models in Hanoi

Model 1: Fruit and vegetable traditional supply chain model in Hanoi

The structure of chain

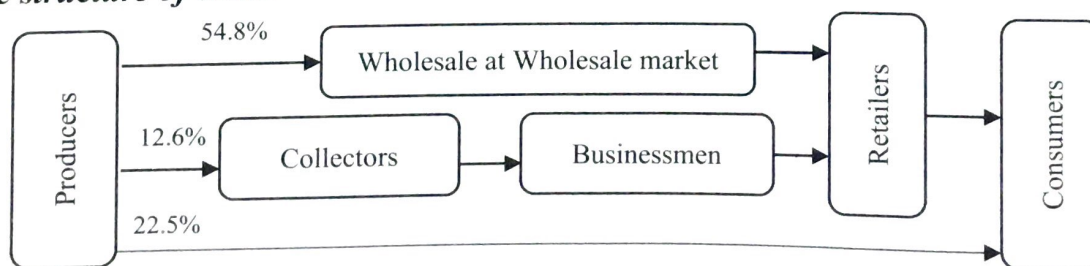


Figure 3. Fruit and vegetable traditional supply chain structure in Hanoi

(Source: Hanoi Department of Agriculture and Rural Development, Hanoi Department of Industry and Trade, Hanoi Statistical Office and survey data, 2018)

Currently, this chain is responsible for distributing 89.9% of Hanoi's fruit and vegetable production, equivalent to nearly 5,000 tons of vegetables and fruits per day.

Operating organisation of fruit and vegetable traditional supply chain in Hanoi in general and at wholesale markets in particular

The members in the fruit and vegetable supply chain according to the participated members in Hanoi are not strong enough both in size and influence to be able to lead chain, the role of each member is quite independence, production and business activities are separated. The members have set up the business relations on the base of purchase and sale agreement, verbal agreements, and short-term contracts.

Currently, the wholesale markets take the

supply function over 50% output of vegetables and fruits to Hanoi's market, but remain many problems, such as: (1) Organisation is bulky and difficult to manage; (2) Market facilities are weak and backward; (3) There is a phenomenon of small businesses emptying kiosks, having no business, affecting to arrangement of good industry; (4) The area is too narrow to fully implement the technological solutions in arranging, preserving and storing goods and do not ensure the environmental sanitation. (5) There is no specific set of criteria for agricultural wholesale markets... The operation of chain is messy, there is a lack of sustainable and unstable links. Therefore the value-added of chain is low.

Model 2: Fruit and vegetable supply chain led by wholesalers (Mega Market – MM)

The structure of chain

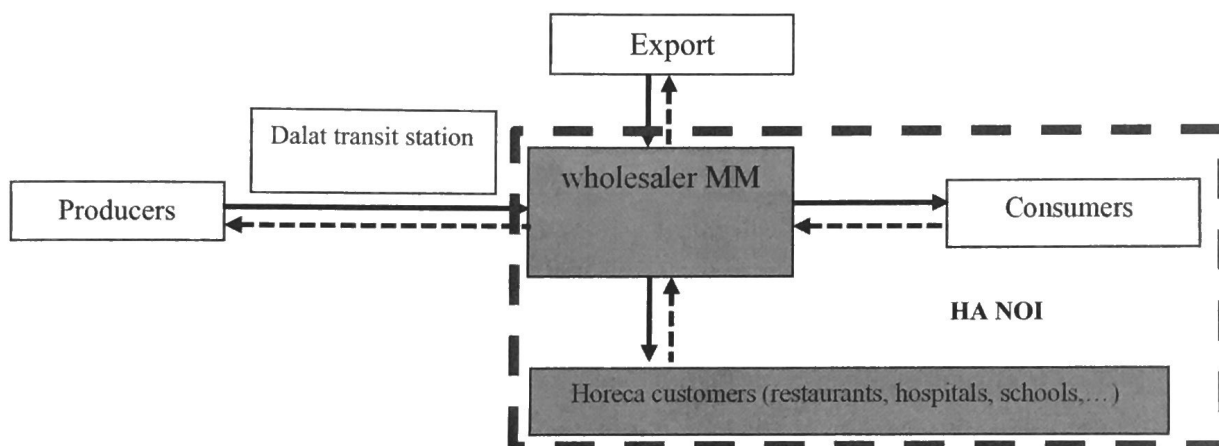


Figure 4. Fruit and vegetables supply chain structure led by Mega Market wholesaler in Hanoi

(Source: Mega Market Vietnam and survey data, 2018)

Operational organisation of fruit and vegetable supply chain led by MM wholesaler

All vegetables and fruits after harvest are gathered and packed at the system of modern purchasing and transshipment stations in Da Lat, Can Tho and Binh Duong before distributing to MM centers nationwide. Being evaluated as one of the transit stations meeting FHS conditions for the leading fruit and vegetable products in Vietnam, MM's vegetable and fruit processing centers are sourced according to VietGAP standards and operated

according to HACCP standards currently provided. 40 tons of fruits and vegetables per day at 19 MM centers. Here, vegetables are checked, screened, preliminary processed, preserved, packed in accordance with committed standards. Transport system by specialized cold car. The temperature is always controlled during transportation. Products displayed are labeled QR Code so that customers can traceability, improve peace of mind when using.

Model 3: Fruit and vegetable supply chain led by retailers

The structure of chain

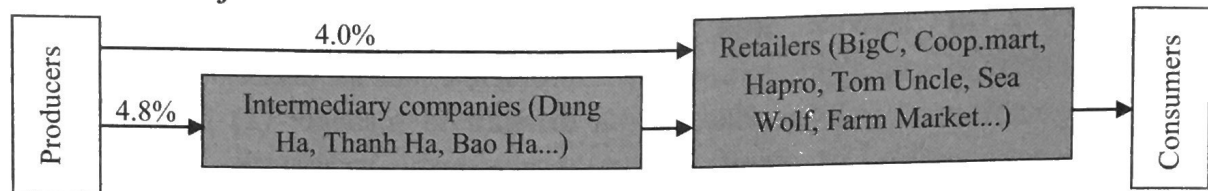


Figure 5. Fruit and vegetables supply chain structure led by retailers in Hanoi

(Source: Hanoi Department of Agriculture and Rural Development, Hanoi Department of Industry and Trade, Hanoi Statistical Office and survey data, 2018)

In this model, chain is organized to supply vegetables and fruits to consumers through one or two distribution intermediaries: retailers or intermediary companies/retailers. The most important point in this chain is the retailers' role in leading and coordinating. Presently, this chain supply about 8.8% total quantity of vegetables and fruits in Hanoi - equivalent to about 500 tons of all kinds of vegetables and fruits per day. This chain has a strong growth orientation due to the convenience, reasonable price, and not too complicated in chain management.

Operating organisation of fruit and vegetable supply chain led by retailers

Several retailers have been leading and coordinating the fruit and vegetable supply chain in Hanoi, such as: Big C, Fivimart, Tom Uncle, Sea Wolf, Farm Market. These retailers have many advantages of direct contact with customers, market research. Therefore, it will be an important bridge helping producers to well meet customers' needs. This is the basis for establishing commitments or long-term contracts between retailers and producers. Besides, retailers consider the certificates such as PGS or VietGap to establish partnerships.

Model 4: VinEco closed fruit and vegetable supply chain

The structure of chain

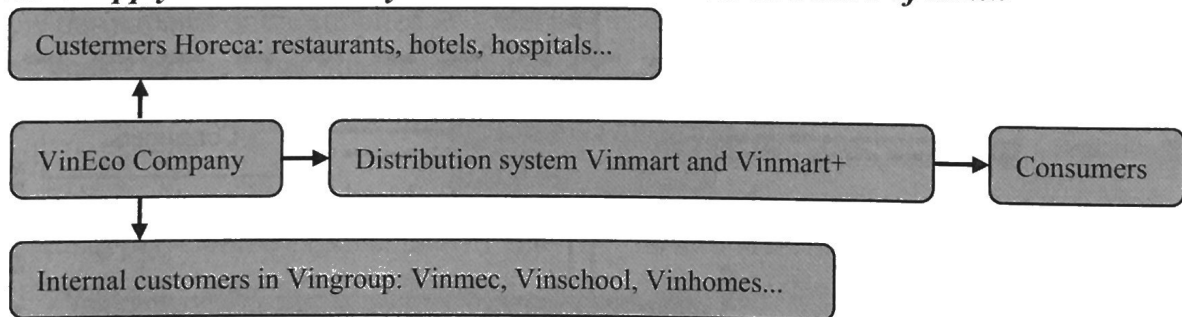


Figure 6. Structure of VinEco closed fruit and vegetable supply chain

(Source: VinEco Agricultural Production Development Investment Limited Company, Hanoi Department of Agriculture and Rural Development, Hanoi Department of Industry and Trade, Hanoi Statistical Office and survey data, 2018)

Operating organisation of VinEco closed fruit and vegetable supply chain

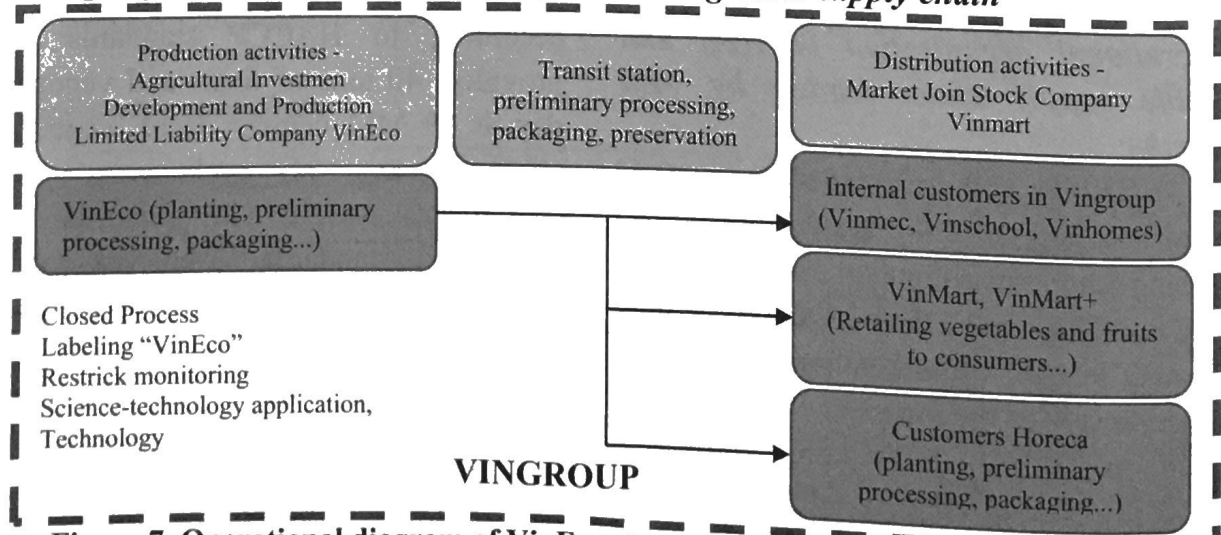


Figure 7. Operational diagram of VinEco closed fruit and vegetable supply chain

(Source: VinEco Agricultural Production Development Investment Limited Company, and survey data, 2018)

Model 5: ShareFarm supply chain model in Hat Mon – Phuc Tho

The structure of chain

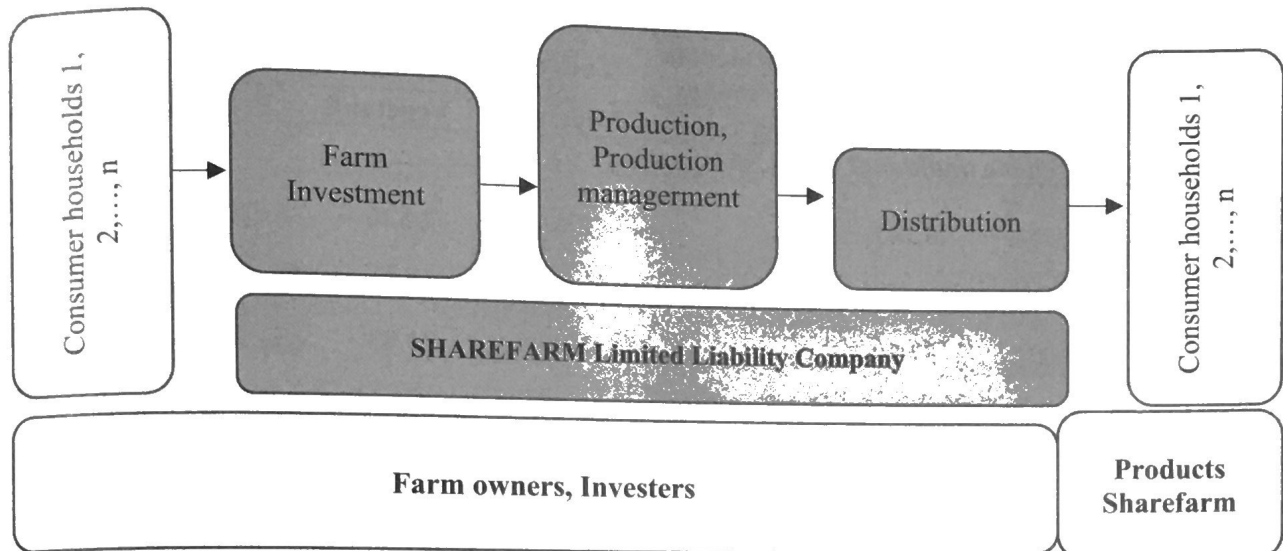


Figure 8. ShareFarm supply chain model in Hat Mon – Phuc Tho

(Source: Sharefarm shared farm joint stock company, 2018)

The objectives of Hat Mon Sharefarm: (1) To full continuously weekly provide and home delivery of food packages for 360 households (4-person households); (2) High-tech technology and production techniques adopt the natural way with the motto "synthesis ecology - closed circulation balance - natural agreement in a controlled environment"; (3) All agricultural products of Sharefarm are products of healthy organic ecosystems; (4) Closed chain model directly bring products from farm to household.

Operating organization of the Sharefarm supply chain model

Firstly, 360 households participated the model will share to involve all stages of the investment-production-consumption process. They are producers; through Sharfarm Company and tools with the support of high-tech, they monitor and clear every issues related to production and production quality. When there are products, 360 households are also consumers using these products.

Members become beneficiaries in the true sense: (1) To be enjoy the safe and fresh products; (2) To meet the needs of the families' weekend recreation/entertainment; (3) To practice agricultural production for families' members, to experience direct services at the farm such as: relaxing fishing, enjoying the fresh air, rural pleasure...

3.2.2. Situation of value-added of fruit and vegetable supply chain models in Hanoi

- The members' value-added in the fruit and vegetable supply chain model according to the participants are completely lower than the members' in the other ones.

- The total of value-added, producers' and retailers' value-added in the VinEco closed fruit and vegetable supply chain are highest.

- The fruit and vegetable supply chain led and coordinated by retailers ensure the harmonization in value-added allocation for members in the chain (the value-added proportion for the producers in this chain is highest – 37.51%).

Table 1. Summary of value-added results of fruit and vegetable supply chain models in Hanoi

Unit: dong/kg								
Target	Producer		intermediary company	Collector	Wholesalers		Retailer	
	Vegetable	Fruit			Vegetable	Vegetable	Fruit	Vegetable
Model 1: Fruit and vegetable traditional supply chain model								
Average value-added of members	2,777	6,142		2,010	2,336	5,500	3,380	5,000
Proportion of average value-added of members	25.95	37.39		20.65	21.83	33.50	31.58	29.11
Total average value-added of vegetable chain		10,703		Total average value-added of the fruit chain				16,420
Model 2: Fruit and vegetable supply chain led and coordinated by wholesalers								
Average value-added of members	3,965	8,020			5,430	6,450	3,769	5,000
Proportion of average value-added of members	30.12	41.19			41.25	33.13	28.63	25.68
Total average value-added of vegetable chain		13,164		Total average value-added of the fruit chain				19,470
Model 3: Fruit and vegetable supply chain led and coordinated by retailers								
Average value-added of members	3,811	11,070	2,915				4,645	8,000
Proportion of average value-added of members	37.51	58.91	22.22				42.73	41.09
Total average value-added of vegetable chain		12,405		Total average value-added of the fruit chain				19,470
Model 4: VinEco closed fruit and vegetable supply chain								
Average value-added of members	4,904	11,248					12,065	12,200
Proportion of average value-added of members	28.90	47.97					71.10	52.03
Total average value-added of vegetable chain		16,969		Total average value-added of the fruit chain				23,448
Model 5: Sharefarm chain (This model has only operated since 2018, so there is no data to assess the value-added)								

Source: Author compiled from actual survey data

3.2.3. General evaluation about the current situation of fruit and vegetable supply chain models in Hanoi

Evaluation about the market share of fruit and vegetable supply chain models in Hanoi

The market shares of fruit and vegetable supply chain models in Hanoi in 2014-2018 period are shown below. The information in 2017 was lack, because the author could not collect data.