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VEGETABLE AND PORK INDUSTRIES IN VIET NAM: SECTORAL ANALISYS



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Overview

This study gives an overall picture of two of the most important commodities in Vietnamese agriculture: vegetable and pork. Given the importance of agriculture in Viet Nam' economy, this paper has three main objectives: 1) to give a comprehensive picture about agricultural policy framework in Viet Nam, including the institutional arrangements for administering this theme, supporting institutions for research and development, business supporting institutions, and policy applied and under application; 2) to review the current situation of vegetable and pork sector; 3) to identify opportunities and challenges for the development of a modern supply chain in these two sectors.

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List of abbreviations

AANZFTA	ASEAN-Australia-New Zealand Free Trade Agreement
ACFTA	ASEAN-China Free Trade Agreement
AIFTA	ASEAN-India Free Trade Agreement
AJCEP	ASEAN-Japan Comprehensive Economic Partnership
AKFTA	ASEAN-Korea Free Trade Agreement
ASEAN	Association of South-East Asian Nations
ASF	Animal Source Food
ATIGA	ASEAN Trade in Goods Agreement
BAFU	Bac Giang Agriculture and Forestry University
BSA	Bovine Spongiform Encephalopathy
CEPEA	Comprehensive Economic Partnership in East Asia
CIEM	Central Institute for Economic Management
CPV	Communist Party of Viet Nam
DAFE	Department of Agriculture and Forestry Extension
DARD	Departments of Agriculture and Rural Development
EAFTA	East Asia Free Trade Agreement
EVFTA	European Union-Viet Nam Free Trade Agreement
FAVA	Federation of Asia Veterinary Association
FAO	Food and Agricultural Organization of the United Nations
FAPRI	US Food and Agriculture Policy Research Institute
FAVRI	Fruit and Vegetable Research Institute
FMD	Foot-and-Mouth Disease
GEL	General Exclusion List
GSO	General Statistics Office of Viet Nam
HSL	Highly Sensitive List
IDMC	Irrigation and Drainage Management Company
ILRI	International Livestock Research Institute
IPSARD	Institute of Policy and Strategy for Agriculture and Rural Development
ISF	Irrigation Service Fee
ITC	International Trade Center
JICA	Japan International Cooperation Agency
MARD	Ministry of Agriculture and Rural Development
MFN	Most Favored Nation
MOF	Ministry of Finance
MOH	Ministry of Health
MOIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MOST	Ministry of Science and Technology
MPI	Ministry of Planning and Investment
MRD	Mekong River Delta
MRL	Minimal Chemical Residues
NA	National Assembly
NAEC	National Agriculture Extension Centre
NIAPP	National Institute of Agricultural Planning and Projection
NIAS	National Institute of Animal Sciences
NIVR	National Institute of Veterinary Research
NPK	Nitrogen, Phosphorous, Potassium
NT	Normal Track
NWRC	National Water Resources Committee
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
OIE	World Organization for Animal Health (aka Office International des Epizootes)

PRRS	Porcine Reproductive and Respiratory Syndrome
RCEP	Regional Comprehensive Economic Partnership
RIA1/2/3	Research Institute of Aquaculture I/II/III
RIMF	Research Institute of Marine Fisheries
RRD	Red River Delta
SBV	State Bank of Viet Nam
SL	Sensitive List
SOE	State-Owned Enterprise
SPL	Special Products List
SPS	Sanitary and Phytosanitary
TBT	Technical Barriers to Trade
ToT	Training of Trainers
TPP	Trans-Pacific Partnership
TRQ	Tariff-Rate Quota
VAAS	Vietnamese Academy of Agriculture Sciences
VAFA	Viet Nam Animal Feed Association
VAFS	Vietnamese Academy of Forest Sciences
VASEP	Viet Nam Association of Seafood Exporters & Processors
VAWR	Viet Nam Academy for Water Resources
VBARD	Viet Nam Bank for Agriculture and Rural Development
VBSP	Viet Nam Bank for Social Policies
VCA	Viet Nam Cooperative Association
VCCI	Viet Nam Chamber of Commerce & Industry
VCFTA	Viet Nam-Chile Free Trade Agreement
VDB	Viet Nam Development Bank
VEPR	Viet Nam Institute for Economic and Policy Research
VFA	Viet Nam Food Association
VFU	Viet Nam Forestry University
VHA	Viet Nam Husbandry Association
VHLSS	Viet Nam Household Living Standards Survey
VIAEP	Viet Nam Institute of Agricultural Engineering and Post-harvest Technology
VICOFA	Viet Nam Coffee & Cocoa Association
VIETRADE	Viet Nam Trade & Promotion Agency
VIFEP	Viet Nam Institute of Fisheries Economics and Planning
VINACAFE	Viet Nam National Coffee Corporation
VINACAS	Viet Nam Cashew Association
VINAFOOD I	Viet Nam Northern Food Corporation
VINAFOOD II	Viet Nam Southern Food Corporation
VINAFRUIT	Viet Nam Fruit & Vegetable Association
VINASUGAR I	Sugarcane and Sugar Corporation No.1 – Joint-stock Company
VINASUGAR II	Sugarcane and Sugar Corporation No.2 – Joint-stock Company
VINATEA	Viet Nam National Tea Corporation
VJEPA	Viet Nam-Japan Economic Partnership Agreement
VKFTA	Viet Nam-Korea Free Trade Agreement
VNFU	Viet Nam Farmers' Union
VNUA	Viet Nam National University of Agriculture
VRA	Viet Nam Rubber Association
VTA	Viet Nam Tea Association
VVA	Viet Nam Veterinary Association
VVPA	Viet Nam Veterinary Pharmaceutical Association
VWU	Viet Nam Women's Union
WRU	Water Resource University
WTO	World Trade Organization
WUG	Water User Group

1. Introduction

Viet Nam stretches 1,600 kilometers from China to the Gulf of Thailand, encompassing virgin forests, rugged mountains and fertile valleys. Shaped like an elongated S, or to the more imaginative a "descending dragon", Viet Nam covers the length of the Indochinese peninsula, bordering the China Sea in the East, Laos and China in the north, and Cambodia in the west. Viet Nam's territory includes a vast sea area including a large continental shelf and various islands.

Viet Nam has emerged as one of Asia's dynamic economies. Beginning in 1986, the Government of Viet Nam embarked on a gradualist approach to market reform and economic development. Centrally planned controls were loosened, land laws reformed, and export-oriented industries fostered. Following Viet Nam's market reforms, per capita gross domestic product (GDP) growth has averaged more than 5 percent per year and is among the highest in Asia behind China. Today, Viet Nam is a country with over 90 million people and has a growing middle class. It is a leading exporter of coffee, rice, and natural rubber and a major importer of agricultural commodities used for inputs in manufactured consumer products such as shoes, leather goods, and garments. With a policy goal of growth and liberalization, Viet Nam continues to maintain its course for further development.

The impact of trade liberalization on Viet Nam's economy is significant in terms of promoting exports, imports and economic growth in the country. Free Trade Agreements have had positive influence on exports. In addition, there has been a rapid growth in agriculture due to the integration of Vietnam in the ASEAN and the world market through FTAs and WTO.

Agriculture remains an important sector, with 70 percent of its population living in rural areas. About two-thirds of the Viet Nam population depends on the agricultural sector as a main source of employment and livelihood. The contribution of agriculture to the GDP has been 18.1% in the period 2011-2015 (World Bank, 2015), with a decreasing trend over the last years (the contribution was 20.1% in the period 1996-2005), but it still is an important economic sector in terms of food production, employment, production of raw material for industries, and source of foreign exchange earnings.

Vegetable and fruit production plays an important role on the agriculture of many countries in the world. Vegetable and fruit sector is also an important production sector of Vietnamese agriculture. Vietnam enjoys numerous favorable conditions for vegetable and fruit production in which climate and ground are suitable with tropic, subtropical vegetables and fruits and some temperate vegetables and fruits.

Livestock sector is gaining more relevance in Vietnamese diet because of the rapid increase in per capita income in Viet Nam during the last two decades, which has accelerated household expenditures from USD 214 to USD 512 during 1994-2011 (World Bank, 2013). Among the food items, animal-source food (ASF) is the main protein for Vietnamese consumers, and the demand for ASF is rising due to the population growth as well as consumer income.

Recently, Viet Nam's Government has focused more on improving the competitiveness of the agriculture sector for both export-oriented products (such as rice, coffee, fish) and the domestic market (such as meat and vegetable and fruit). Rising competition in both world and domestic markets for agricultural products, disease outbreaks, increasing input prices, and food safety and quality issues are just some of the obstacles to development of Viet Nam's food and agriculture sector.

This report aims at giving an update overview about the importance of two of the main commodities in Vietnamese agriculture, vegetable and pork, in order to give a better understanding about the context that Vietnamese agriculture is facing nowadays, and about the opportunities and challenges for the recent future.

2. Institutional arrangements for administering agricultural policy

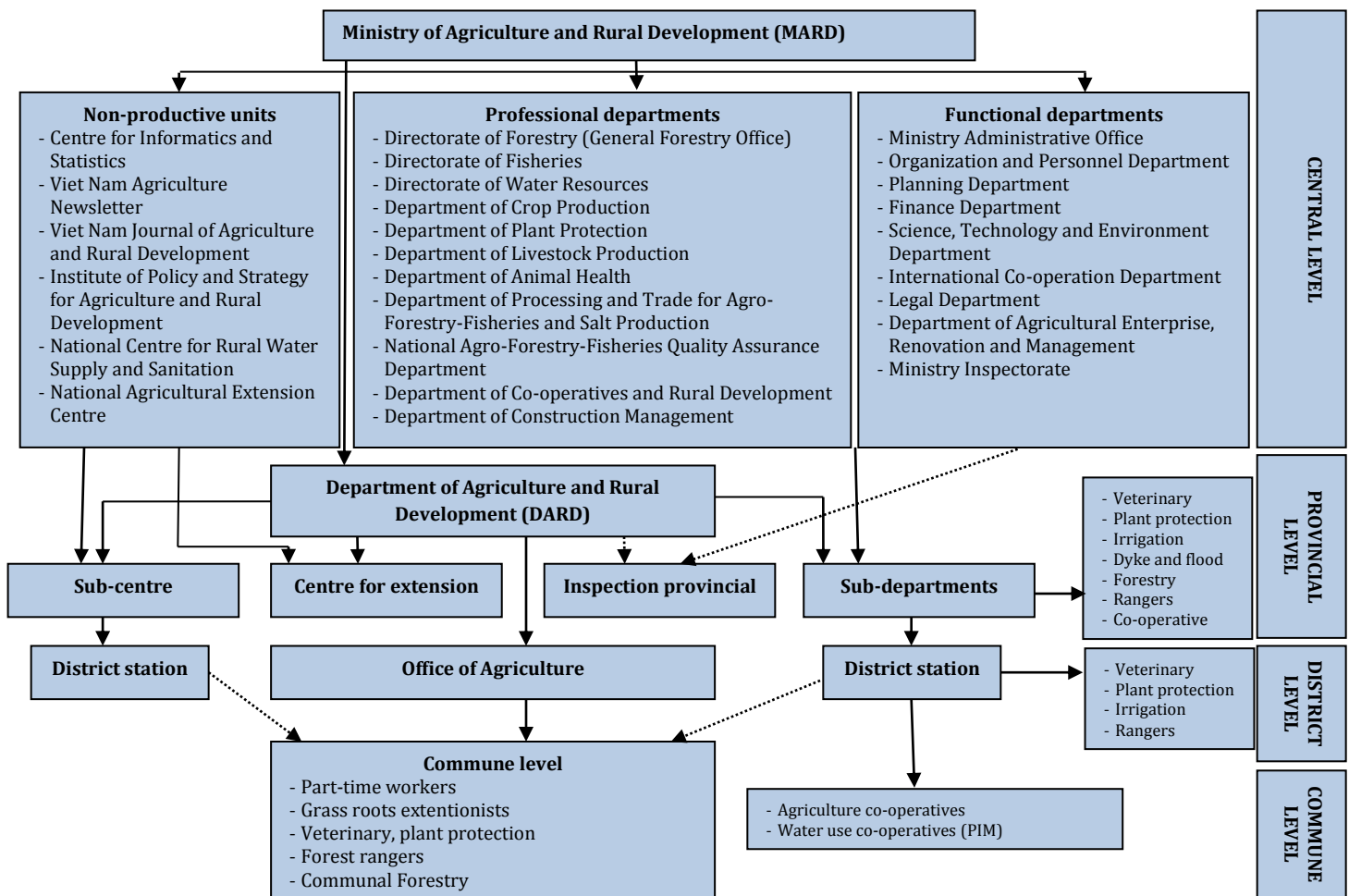
2.1. Central government ministries and agencies

MARD has the main responsibility for formulating, implementing and administering agricultural policy. It is also responsible for performing the state management functions in relation to the forestry, fisheries and salt production sectors, irrigation/water services and rural development nationwide. The main tasks of MARD are to:

- Submit to the government legal projects, draft resolutions of the National Assembly (NA), ordinances, draft resolutions of NA Standing Board; draft resolutions, decrees based on approved programs, annual law plans of MARD and projects assigned by the government and the Prime Minister.
- Submit to the Prime Minister the development master plans and strategies; annual, five-year and long-term plans as well as key programs and projects within MARD's mandated areas.
- Issue decisions, directives, and circulars within MARD's mandated areas; inspect the implementation process.
- Guide, supervise and organize the implementation of strategies, master plans, programs, projects, standards, etc.

MARD's organizational structure is comprised of 26 units, consisting of 11 professional department offices, 9 functional departments and 6 "non-productive" units. The main functions are set out in Table 1.

Figure 1. Level flow chart of Ministry of Agriculture and Rural Development, 2013



Source: MARD International Cooperation Department, <http://icd.mard.gov.vn/tabid/270/Default.aspx>

Table 1. Main tasks of units under the MARD

CAT.	UNITS	ACTIVITIES
Functional Departments	Ministry Administrative Office (Office of the Ministry)	Integrates and co-ordinates the operation of the entities within the Ministry.
	Organization and Personnel Department	Responsible for staffing and training of public servants.
	Planning Department	Oversees the integrated management of strategies, master plans and investment for the agricultural and rural development sector as regulated by law. In charge of public budget planning and allocation for different sectors.
	Finance Department	Responsible for the integrated management of financing, accounting, and pricing.
	Science, Technology and Environment Department	Oversees the integrated management of agriculture and rural sector science and technology, including research, standards, measurement and results, including the planning and allocation of funding for research and extension.
	International Co-operation Department	Oversees the integrated management of international co-operation and international economic integration. It takes the leading role in coordinating with donors and other relevant agencies and NGOs in preparing, appraising and negotiating ODA and FDI projects and programmes in Viet Nam's ARD Sector. It also contains the SPS Office.
	Legal Department	Responsible for the integrated management of MARD's governance of law-related activities and tasks. Ensures the legality of policies developed by other MARD departments before issuing.
	Department of Agricultural Enterprise, Renovation and Management	Assists the Minister in setting up, steering, instructing, monitoring, and checking the implementation of re-structuring, renovation and development of state-owned enterprises within the domains of MARD.
	Ministry Inspectorate	Inspects, verifies and recommends solutions to complaints and denunciations. Steers and guides on organization and professional processes of administrative and specialized inspections.
General Offices	General Forestry Office (Directorate of Forestry)	Policy for public investment and management of forestry sector.
	General Fisheries Office (Fisheries Directorate)	Policy for public investment and management of aquaculture sector.
	General Irrigation and Water Management Office (Water Resource Directorate)	Policy for public investment and management of irrigation system.
Professional Departments	Department of Crop Production (Cultivation Department)	Responsible for policy and management of crop production including inputs such as seeds and fertilizers, and setting quality standards. Manage cultivation techniques, quality and utilization of fertilizers. Steer the cultivation and production plans. Set up strategies, schemes, plans, procedures, norms, techniques and technologies for species of plants and fertilizers. Manage the attestation, corroboration of quality, field-testing, recognition and trademark protection of new species of plants and new fertilizers. Incorporate the management over the plant gene stock.
	Department of Plant Protection	Works on legislation review, plant protection, plant quarantine, and pesticide/chemical control. It plays an advisory role for MARD and can propose policies related to its sphere of responsibilities. It has provincial branches known as the Plant Protection Department.
	Department of Livestock Husbandry	Performs professional functions related to the governance of the animal husbandry and livestock sector including draft laws, strategies and plans, quality certification and licensing. Responsible for inputs such as breeding and animal feed, and quality

	standards.
	Department of Animal Health Performs professional functions related to the governance and inspection of veterinary activities nationwide.
	Department of Processing and Trade for Agro-forestry-fisheries Products and Salt Production Performs professional functions related to the governance of preservation and processing of agricultural, fishery and forest products and salt production, including managing the mechanization and industrialization of sectoral production.
	National Agro-forestry-fisheries Quality Assurance Department Responsible for food safety administration for the products under MARD jurisdiction and the development of food safety policies in general in co-ordination with MOIT and MOH.
	Department of Collective Economics and Rural Development Performs governance functions over co-operatives, farmer organizations and other agricultural production entities, including integration of policies and rural development programmes. It has responsibility over poverty reduction.
	Department of Construction Management Submit to the Ministry proposals for capital construction programmes and projects, and investment decisions. Appraises the technical designs and cost estimates for projected building items. Appraises biddings and selection of contractors, and perform the consultant role for investment and bidding for construction and assembly work. Certifies the quality of constructed works. Monitors and accelerates the progress of investment activities.
Non-productive Units	Centre for Informatics and Statistics Responsible for implementing all statistical activities (collecting, analyzing and reporting) in the agricultural sector (within MARD, under MARD, and local state agricultural authorities) and provision of market information systems for agricultural products.
	National Agricultural Extension Centre Follows MARD guidelines and strategies with demonstration models, information disseminations, training, service delivery and international co-operation in the fields of agricultural, forestry and fishery.
	National Centre for Rural Water Supply and Sanitation Responsible for implementing the National Target Program on Rural Water Supply and Sanitation. The program involves installing community and household water systems, public latrines and water supply in schools and clinics, and training and capacity building.
	Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD) The policy think-tank, providing analysis and results supporting strategy and policy formulation process in agriculture and rural development. Established by Decision 9/2006/WQD-TTg dated 9 September 2006, initially as a separate and independent agency, it became a line department in 2013.

Source: MARD, 2014.

There are 63 **Departments of Agriculture and Rural Development (DARD)**, one for each of the 58 provinces and 5 municipalities. DARD provides advice, administration and instruction at the provincial and district levels to plan and implement central government policies including agricultural land registration, land allocation, extension, irrigation and rural development planning.

A large number of other central government line ministries or public institutions have responsibilities for policies directly impact on the agricultural sector. The main ones include:

- **Ministry of Planning and Investment (MPI)** is responsible for the state management of planning, development investment and statistics. The Department of Agricultural Economy is in charge of allocating state investment in agriculture and the Central Institute for Economic Management (CIEM) has a direct reporting role about economic policies, including food prices and agricultural policies.

- **Ministry of Industry and Trade (MOIT)** is responsible for the state management of industry and trade in both the domestic market and internationally. The Agency of Foreign Trade (Department of Export and Import) is responsible for issuing import, export, duty exemption and quota certificates, and managing tariff-rate quotas. The Domestic Market Department manages the rice trade in the domestic market. The Science and Technology Department is responsible for the food safety of products under MOIT jurisdiction.
- **Ministry of Natural Resources and Environment (MONRE)** proposes investment incentives related to land and waste water treatment procedure.
- **Ministry of Finance (MOF)** is responsible for the finances of the state, including managing the national budget, tax revenue, state assets and the finance of state corporations. The Department of Price Management is responsible for monitoring and implementing appropriate policies to stabilize the domestic prices of selected commodities. The Department of Tax Policy is responsible for the agricultural land use tax and import/export taxes. The General Department of State Reserves is responsible for managing the state reserves of specific products, including rice, seeds, veterinary medicines and crop protection chemicals.
- **Ministry of Science and Technology (MOST)** is responsible for the state management of science and technology including research, intellectual property, standards and meteorology. The Department of Intellectual Property manages the registration of trademarks, origin branding such as geographic indication, and the collective branding of agricultural products.
- **Ministry of Health (MOH)** is responsible for the governance and guidance of the health, healthcare and health industry including nutrition. The Viet Nam Food Administration is responsible for the food safety of products under MOH jurisdiction.

Local government

A complex structure of representation and responsibility exists at the sub-national level. At each of three levels (provincial, districts and communes),¹ inhabitants elect a local People's Council who in turn elect a local People's Committee. The local People's Committee is responsible for implementing the Constitution, laws, and documents issued by higher state organs and resolutions of the local People's Council, and for issuing and implementing decisions and directives within their areas of competence (WTO, 2013).

Prior to the implementation in 2004 of Law No. 01/2002/QH11 on the State Budget dated 16 December 2002, the fiscal management of local budgets was highly centralized. The State Budget Law 2002 advanced fiscal decentralization, leaving the organization of expenditures at the sub-national level up to the provincial government. This provides a large amount of discretion to the provincial government to adapt to their specific conditions, but less so for sub-provincial level governments (Bjornstad, 2009).

All revenues collected from taxes and fees related to international trade must be transferred to the central budget. Local governments retain 100% of the revenues they collected from land (e.g. renting, tax on land use transfers and land use tax), from natural resource tax, registration fees and from lottery. Another source of revenue for provinces is part of the revenue collected from VAT, corporate income tax, personal income tax, and gasoline fee. There exists a sharing mechanism between central and provincial government for these revenues, but the majority of provinces can retain 100% for their own budget. As a result, large differences in budget revenue between provinces have begun to emerge because of the revenue sharing arrangements (Tran, 2014b).

¹There are 63 "provincial governments (58 provinces and 5 municipalities), 662 "districts" (536 rural districts, 25 provincial cities, 59 district level towns and 42 urban districts) and 10.776 "communes" (9.012 communes, 583 commune-level towns and 1.181 wards).

2.2. Para-statal institutions

Prior to the *Doi Moi* reforms the economy was largely dominated by SOEs. While markets have been liberalized, SOEs remain an important and influential part of Viet Nam's agricultural sector. There are some commodities such as rubber, tea, coffee and to a less extent sugar, and several other SOEs are involved in processing and trade, as well as supplying inputs to farmers. In addition, SOEs enjoy near-monopoly status in the production of several goods and services providing agricultural inputs, specifically fertilizers (99% of total output), electricity and gas (94%) and water supply (90%) (World Bank, 2012).

Table 2. Major state-owned enterprises involved in agriculture

Name	State-owned	Activities
Viet Nam Northern Food Corporation (VINAFOOD I)	100%	Involved in the purchase, processing, import and export of a range of food, wood and salt products. Imports fertilizers, animal feed product and other agricultural inputs. Reformed into a limited company under Decision No. 1544/2009/QD-TTg dated 25 September 2009.
Viet Nam Southern Food Corporation (VINAFOOD II)	100%	The larger exporter of rice, with capacity to process 3 million tonnes of rice per year, storage facilities for over one million tonne, and exclusive supplier status for government-to-government contracts. It also processes and exports a range of other agricultural commodities including cassava, maize, beans, cashew nuts and coffee, as well as seafood and fish. It imports and processes wheat into consumer products, and operates a chain of retail stores and a hotel/resort system. Reformed into a limited company under Decision No. 979/2010/QD-TTg dated 25 June 2010.
Viet Nam Rubber Group (VRG)	100%	VRG is the largest rubber company in Viet Nam with 40 subsidiaries, 39 farms, and 30 processing plants. Through its subsidiaries VRG controls about 270.000 ha of rubber plantations, corresponding to 40% of the national total and 85% of total export production. Established in its current ownership structure by Decision No. 249/2006/QD-TTg dated 30 October 2006 following the restructuring of the Viet Nam Rubber Corporation as a multi-ownership Group. VRG is also involved in a livestock production, plantation forests, wood processing, electricity, engineering, managing seaports, etc.
Viet Nam National Coffee Corporation (VINACAFE)	100%	Established by Decision No. 251/1995/QD-TTg dated 29 April 1995, VINACAFE is the biggest state-owned corporation specializing in coffee production, processing, exporting in Viet Nam, and carrying out general business operations. It is made up 56 companies, enterprises and agricultural fields. It produces 50 000 tonnes of coffee beans and exports 250 000-300 000 tonnes of coffee beans per year – accounting for 20-25% of Vietnamese coffee beans exports. VINACAFE also exports peppers and cashew nuts, imports fertilizers and facilities for the coffee industry, undertakes research into coffee production, and assists producers by providing seeds and advice.
Viet Nam National Tea Corporation (VINATEA)	100%	The biggest state-owned producer, manufacturer and marketer of tea, exporting around 70.000 tonnes each year to more than 50 countries. It owns more than 100.000 ha of tea plantations, it manages over 60 tea enterprises and 6 joint ventures with foreign partners. Involved in tea research and providing extension services.
Sugarcane and Sugar Corporation No. 1 – Joint-stock Company (VINASUGAR I)	64%	Growing sugar cane and production of sugar products, confectionary, spices and beverages. Trading in fertilizers, agrochemicals, food products, and machinery and spare-parts for the sugar industry. Provision of construction and investment services for sugar mills and business warehousing. Capital invested into a number of other sugar processing companies. Reformed into a joint-stock company under Decision No. 1913/2012/QD-TTg dated 21 December 2012.
Sugarcane and	64%	Growing sugar cane and production of molasses, refined sugar, confectionary, alcohol,

**Sugar Corporation
No. 2 – Joint-stock
Company
(VINASUGAR II)**

soft drink, wine, beer, micro-organic fertilizers, plywood MDF, cattle feed; sugar technical services, providing goods for material areas. Producing food containers/wrapping, textile industry. Manufacturing the mechanical products and tools for sugar industry. Investment consulting and construction for sugar industry. Building, repairing, developing and expanding sugar factory. Wholesale and retail of the products of food manufacturing, the specialized machines and spare-parts, materials, and consumer products. Hostel business, office leasing, warehouse leasing and house trading. Capital invested into a number of other sugar processing companies. Reformed into a joint-stock company under Decision No. 1914/2012/QĐ-TTg dated 21 December 2012.

Source: OECD, 2015

2.3. Farmer organizations

Prior to the *Doi Moi* reform, cooperatives were the primary entity around which agricultural policy was centered. After that, their number fell from a peak of over 126.000 in the early 1980s to just under 14.000 in 1997. Recognizing farmers, particularly small-scale producers, would still benefit from co-operatives institutions to provide inputs and assist with marketing, the first Law on Co-operatives dated 20 March 1996 and effective on 1 January 1997 was enacted to provide a new direction. The Law required existing co-operatives to be transformed into membership-oriented service co-operatives promoting the income of their members rather than as a delivery mechanism for government; otherwise they had to be dissolved. Despite these changes, the number of agricultural service co-operatives has continued to fall around 10.400 at the end of 2013 (MARD, 2014). The vast are located in the northern half of the country: 36% in the Red River Delta (RRD), 27% in the Northern Central and Central coastal areas, and 19% in the Northern midlands and mountainous regions.

Table 3. Agricultural co-operatives by sector and region, 2013

Sector	Region						Total
	Red River Delta	Northern midlands and mountainous areas	North Central and Central coastal areas	Central Highlands	South East	Mekong River Delta	
	Number						
Agricultural services	3633	1842	2691	412	282	917	9777
Forestry	4	31	8	0	0	10	53
Aquaculture	101	105	48	6	20	211	491
Fisheries capture	1	1	23	0	2	6	33
Salt industry	25	0	24	0	1	2	52
Total	3764	1979	2794	418	305	1146	10406
	Share of total agricultural co-operatives (%)						
Agricultural services	34.9	17.7	25.9	4.0	2.7	8.8	94.0
Forestry	0.0	0.3	0.1	0.0	0.0	0.1	0.5
Aquaculture	1.0	1.0	0.5	0.1	0.2	2.0	4.7
Fisheries capture	0.0	0.0	0.2	0.0	0.0	0.1	0.3
Salt industry	0.2	0.0	0.2	0.0	0.0	0.0	0.5
Total	36.2	19.0	26.8	4.0	2.9	11.0	100.0

Source: MARD 2014, Statistical Yearbook of Agriculture and Rural Development 2013.

In addition to formal agricultural co-operatives, there also exist more informal collaborative groups among farmers. There were almost 62.500 such groups in 2013, up from 50.000 in 1996, many of these located in the Mekong River Delta (MRD). In general, they focus on organizing soil preparation and irrigation, as they are not allowed to conduct business activities (e.g. marketing) on their own. While this might be a disadvantage, these entities can work fairly flexibly on an ad hoc basis, need only a simple management structure and do not have to pay taxes (Wolz and Pham, 2010).

Despite government support, the role of co-operatives remains insignificant. A revised Law on Co-operatives was introduced on 20 November 2012 and came into effect on 1 July 2013. The Law No. 23/2012/QH13 is intended to support the innovation and development of co-operatives through the training of personnel management, provision of technical assistance and technology transfer, and assistance with market development and trade promotion. However, many co-operatives are still passive in reforming and adapting to the market economy and economic integration (Tran, 2014b).

2.4. Research and development

Prior to 2005 there were 30 different research agencies within MARD (28 research institutes and 2 universities), each with their own budget and often with overlapping mandates. In order to achieve greater co-ordination these institutes were merged and reorganized in 2005 into 16 agencies, comprising 12 research institutes and 4 universities. For a more detailed list of the institutes, including organizational chart, expended functions and tasks, and contacts, see Annex 1.

Table 4. List of research institutes and universities within MARD and their functions

INSTITUTE	FUNCTIONS & TASKS
Vietnamese Academy of Agriculture Sciences (VAAS)	To implement scientific activities in the following areas: Genetic resource conservation of plants, animals and micro-organisms; Plant and animal breeding and genetics; Agricultural biotechnology; Soil science; Plant and animal nutrition; Plant protection and animal health; Agricultural environment and ecology; Climate change mitigation and adaptation; Agrarian and farming systems; Food safety; Integrated farming technology; Rural development; Technology transfer and extension; Post-graduate training and capacity building; International cooperation.
Vietnamese Academy of Forest Sciences (VAFS)	To implement basic and applied research in various fields of forest science including: Silviculture and ecology of tropical forests; Sustainable management of forest resources; Forest genetics; Seeds selection, storage and preservation; Bio-technology in forestry; Ecological restoration, protection and conservation; Sustainable forest land use; Climate change and environmental monitoring; Non-timber forest products; Forest policy; Production systems.
Viet Nam Academy for Water Resources (VAWR)	To implement institutional development policies, economic and technical norms on: Water; Environment; Construction; Water Management; Operation of irrigation structures; Equipment and Hydropower; Advanced technology for production; National security and defense; Disaster reduction and Climate change adaptation.
National Institute of Animal Sciences (NIAS)	To implement the basic research, applied research on livestock production such as: Animal genetic and breeding; Pure animal breed conservation; Animal genetic conservation and the animal forage trees; Animal Bio-technology; Bio-diversity and Bio-informatics; Animal reproductive, physiology and behaviors and animal health; Animal feed and nutrition, pasture and forage production; Animal farming system and economics, livestock environment and effect of livestock production to the environment and climate; Animal housing and management, Animal products processing and storage, animal product hygiene.
National Institute of Veterinary Research (NIVR)	To implement scientific research serving for: Epidemic disease prevention in livestock and aquatic animals; Applied biotechnology in veterinary, animal husbandry, aquaculture and environmental treatment; Applied technologies for veterinary and animal husbandry services; Vaccines, bio-substances and veterinary medicines; Trade, import and export materials, chemicals, bio-substances and veterinary medicines.
Viet Nam Institute of Agricultural Engineering and Post-harvest Technology (VIAEP)	To implement scientific research on agricultural engineering technology in the following areas: Farm Power and Cultivation; Crop-Care and Irrigation; Harvesting; Drying, Storage and Processing of Agro-forestry Production; Mechanization in Animal Husbandry; Post-Harvest Biological Technology; Electricity and renewable Energy.

Research Institute of Aquaculture I, II, III (RIA1/RIA2/RIA3)	To carry out scientific and technological research in the field of aquaculture, including: Genetic and Seed production; Aquaculture techniques; Environment management and disease prevention; Resource protection and development for coastal and freshwater areas; Post-harvesting technology; Technology innovation and transfer.
Research Institute of Marine Fisheries (RIMF)	To implement the scientific basis in the following fields: Oceanography and Ecology; Marine resources; Fisheries Biology; Fisheries Management; Relationship between the environment, marine resources and marine fisheries; Effects of climate change to marine fisheries; Microorganisms in environmental remediation; Fisheries Economics; Organizational models of production and exploitation; Biodiversity and Marine conservation.
National Institute of Agricultural Planning and Projection (NIAPP)	Data not available because of website not available in English
Viet Nam Institute of Fisheries Economics and Planning (VIFEP)	Data not available because of website not available in English
Viet Nam National University of Agriculture (VNUA)	RESEARCH INSTITUTES AND CENTERS: Institute of Agro-Biology; Institute of Economics and Development; Institute of Engineering Technology Development; Institute of Crops Research and Development; Center for Agricultural Research and Ecological Studies; Center for Experimentation and Vocational Training; Center for Interdisciplinary Research on Rural Development; Center for Consultation on Natural Resources and Environmental Technologies; Center for Tropical Plant Pathology; Center for Conservation and Development of Crop Genetic Resources; Center for Training and Application of Advanced Technologies.
Viet Nam Forestry University (VFU)	RESEARCH INSTITUTES AND CENTERS: Institute of Biotechnology; Center for Biodiversity; Centers for Services; Center for Research and Technological Transferring in Forest Industry; Institute for Forest Ecology and Environment.
Water Resource University (WRU)	FACULTIES AND DEPARTMENTS: Faculty of Economics; Faculty of Energy Engineering; Faculty of Water Resources Engineering; Department of Hydrology and Environment.
Bac Giang Agriculture and Forestry University (BAFU)	Data not available because of website not available in English

Source: Author's collection from institutional websites

2.5. Business support institutions

Table 5. List of business support institutions in agriculture

ORGANIZATION	FUNCTIONS & TASKS
<p>Viet Nam Trade & Promotion Agency (VIETRADE) http://www.vietrade.gov.vn/en/</p>	<p>To promote trade, especially export, the government established the Viet Nam Trade & Promotion Agency, a government trade promotion organization under MOIT. Export assistance and information is the main job of VIETRADE. It administers buyers' inquiries, maintains contacts with exporters, publicized inquiries to suppliers, and publishes trade directories and bulletins, industrial studies, product monographs, and export handbooks. VIETRADE also provides other business matching services such as coordination and assistance to Vietnamese exporters for participating in exhibitions and trade fairs abroad and at home, organization of Vietnamese selling mission abroad and hosting foreign buying missions.</p>
<p>Viet Nam Chamber of Commerce & Industry (VCCI) http://vccinews.com/</p>	<p>Founded in 1963, VCCI is an independent and non-government organization with members throughout the country. VCCI is engaged in trade and investment promotion. Foreign business people may contact VCCI for help in selecting and making contacts with Vietnamese partners. Apart from hosting business missions from abroad, VCCI also provides foreign individual visitors with services such as identifying and checking out local suppliers, sponsoring business visas, arranging business meetings and/or tailor-made business tours, and interpretation, etc. for which fees are charged. VCCI has its head office in Hanoi and branch offices in Ho Chi Minh City, Vung Tau and Can Tho in the South, Da Nang in the Center, Hai Phong in the North and representative offices in some other major cities.</p>
<p>Viet Nam Food Association (VFA) http://www.vietfood.org.vn/en/</p>	<p>VFA, formerly known as the Viet Nam Food Import and Export Association, was established in 1989. VFA is a social organization of enterprises involved in producing, processing, and trading of agricultural produce, food and other processed food products. Members of VFA work together to coordinate food trading activities for the protection of legitimate interests of its members, to contribute to food security, to import and export food in the international market in compliance with the state policies.</p> <p>Regarding to food safety, (VFA) is the management agency of the Ministry of Health. It assists the Minister of Health in the implementation of the state management on food safety of the domestic food and the imported food in the market in the whole country. VFA is the permanent agency of the Central Inter-ministerial Steering Committee on food safety. Its main mission on food safety is:</p> <ol style="list-style-type: none"> a) Establishing the legislative documents, strategies, master plan, projects on the management of food safety; b) Setting the national technical regulations for foods which are under the management of the Ministry of Health, including: food additives, food processing aids, fortified foods, functional foods, containers and packaging in direct contact with food; c) Setting the requirements of food hygiene and safety condition in processing, production, storage and usage of foods of canteens, restaurants, hotels, supermarkets, catering services, street foods; d) Setting standards and criteria for laboratories on testing relating to food safety; to implement the assessment, recognition of laboratories meeting requirements for the food safety analysis; e) Setting the limitation of contaminants for food products, containers and packaging in direct contact with food; f) Carrying out the license, suspend and recall of the Health Certificate, the Certificate of Free Sale, the Certificate of facilities meeting food safety requirements, the Certificate of food hygiene and safety knowledge, the Receipt of the advertising dossier of products which belong to the field of control; g) Implementing the inspection of food hygiene and safety;
<p>Viet Nam Farmers' Union (VNFU) http://vietnamfarmerunion.vn/SitePages/TrangChu.aspx</p>	<p>Viet Nam Farmers' Union (VNFU) is a social-political organization of Vietnamese peasants under the leadership of the Communist Party of Viet Nam, established in 1930. VNFU is organized at four levels from central level to grass roots. It has more than 10 million members. VNFU exists in all communes and villages where there are farmers. VNFU is important in livestock and fishery development for its roles in connecting members with projects and programs reflecting member needs as well as complaints to leaders. VNFU provides guidelines for its members, organizes training, and acts as input suppliers. VNFU helps farmers acquire credit from banks, purchase inputs in bulk at lower prices and good quality,</p>

	<p>cooperates with extension agencies to organize training, and develops pilot models in agriculture. Most farmers belong to VNFU.</p>
<p>Viet Nam Fruit & Vegetable Association (VINAFRUIT) http://www.vinafruit.com/web/index.php?lang=en</p>	<p>VINAFRUIT was established in March 2001 as a non-governmental organization. The association consists of enterprises operating in the fruit and vegetables sector. It coordinates with Government to manage operations aimed to build and to develop Viet Nam's fruit and vegetables industry in cultivation, preservation, processing, trade promotion and trading fruit and vegetables in local and international markets. It is the link between Vietnamese import-export enterprises, and it assists member-enterprises to improve the quality and reduce production costs, builds up the relationship and cooperation with governmental organizations, local authorities, professional associations, international organizations, news agencies and other related organizations in order to develop and improve the competitive ability of Viet Nam's fruit and vegetables industry. It is in charge of recommending ideas for national trade promotion programs financed by government such as organization of exhibitions and trade fairs.</p>
<p>Viet Nam Husbandry Association (VHA)</p>	<p>VHA was found in 2002, is based in Hanoi, and has a branch in HCMC and is a voluntary organization. The association links members who are engaged in animal production and veterinary to support members in production, processing, and marketing of animal products. VHA also participates and provides consultancies in various areas in husbandry, such as economic development projects. VHA organized a network for disseminating knowledge and technology to members, providing services on animal breeds and inputs for production in the mandated areas. VHA has branches in provinces.</p>
<p>Viet Nam Animal Feed Association (VAFA)</p>	<p>VAFA is a non-government association with members representing all economic sectors operating in feed products/ manufacturing, trading, and consumption. VFA's main tasks are to: (i) disseminate among its members policies related to the feed industry; (ii) develop and propose policies, incentives, and supportive measures towards development of the feed industry; (iii) encourage collaboration and cooperation among members; (iv) provide economic, market, and price information to the members for better economic performance; (v) organize seminars and conferences to exchange professional experience, and encourage cooperation among members for co-existence and development; and (vi) participate in programs and projects to develop animal husbandry and feed production, cooperate with government organizations and NGOs, and organize voluntary agricultural extension to deliver technical advances in agricultural production. VAFA also publishes a magazine and documents disseminating techniques and economic management methods, participates in scientific and technical studies, produces new technologies for development of the livestock industry, especially cattle, poultry, and aqua feed.</p>
<p>Viet Nam Veterinary Association (VVA) http://www.wsava.org/association/vsava</p>	<p>VVA, founded in 1991, is based in Hanoi and a member of the Viet Nam Alliance of Associations of Science and Technology and is financially independent. VVA provides consultancies in various areas such as in building capacity of the veterinary system, epidemiology diagnosis, food safety, management and use of veterinary medicine, and preventive measures against serious animal diseases. VVA also organizes training in food safety, prevention of animal diseases, and improves local veterinarian capacity. VVA has three centers: Transferring Technology in Veterinary, Transferring Technology in Veterinary in Mountainous Areas, and Community Veterinary Centre. VVA is now a member of the Federation of Asia Veterinary Association (FAVA), and cooperates with veterinary associations from Japan, Korea, and other ASEAN countries. VVA also has good cooperation with CEVEO (Coopération et Echanges Vétérinaires Est-Ouest), a non-profit organization made up mainly of French private veterinary surgeons.</p>
<p>Viet Nam Veterinary Pharmaceutical Association (VVPA)</p>	<p>VVPA was founded in 2005 and is based in Hanoi. VVPA is a social-occupational association whose members operate in the field of veterinary medicine in Viet Nam. VVPA is under management of MARD.</p>
<p>Viet Nam Association of Seafood Exporters & Processors (VASEP) http://www.seafo</p>	<p>Viet Nam Association of Seafood Exporters and Producers (VASEP) is a non-governmental organization established in 1998. VASEP members include leading Vietnamese seafood producers and exporters with companies providing services in seafood sector. The mission of VASEP is to support members in improving capacity, quality and effectiveness in their business, to open markets and strengthen competitiveness of Viet Nam seafood products, to establish and develop linkages among members, to protect legal interests of the association and members, to establish and to develop international relations.</p>

od.vasep.com.vn/	In doing so, VASEP performs activities such as providing market information, building database, coordinating partners, promoting conferences and trainings, etc.
Viet Nam Cashew Association (VINACAS) http://www.vinacas.com.vn/	VINACAS was established in 1990 as social and professional organization to provide the following activities: to disseminate growing, processing, consumption information about cashew business and products and services related,; to gather mutual assistance in production and business activities and services, to protect the legitimate legal rights of its members, to develop recommendations to members regarding guidelines and policies of the State laws and international commitments, to enhance product quality and to protect the brand reputation of the industry,
Viet Nam Coffee & Cocoa Association (VICOFA) http://www.vicofa.org.vn/	VICOFA was established in 1990 with the overall objective of: improvement in coordination and concerted action of the key stakeholders, including coffee farmers, small traders, domestic and foreign companies, connecting with the government at the local and national level, contributing to implement successfully the sustainable coffee production program in Viet Nam, through setting up coffee coordinating board and then possibly coffee board of Viet Nam.
Viet Nam Rubber Association (VRA) http://www.vra.com.vn/en.html	VRA is a legal entity and non-profit organization operating since 2004, representing of the Viet Nam rubber industry in participation. VRA provides recommendations to governmental agencies on strategies, policies to safeguard and encourage business in the rubber industry or related to the rubber industry of Viet Nam. VRA's main activities are: grouping enterprises to promote development, propose strategies and policies, protecting members' legal rights and representing its members in partnership, assisting members in trade promotion and business matching, trade fairs, exhibition, study tours, market research, training, etc.
Viet Nam Tea Association (VITAS) http://www.vitas.org.vn/en.html	VTA was established in 1988 and its role and function is divided in 5 groups: i) service activities including the seed service, agricultural extension, technology transfer, trade promotion, market auction, training; ii) consulting activities including advises to government and enterprises counterparts; iii) tea culture activities in order to promote Viet Nam's tea culture; iv) activities of building and deploying national models; v) information activities.
Viet Nam Cooperative Alliance (VCA) http://ica-ap.coop/AboutUs/vietnam-cooperative-alliance-vca	The Viet Nam Cooperative Alliance (VCA) is a non-governmental social, economic organization and an apex organization of Viet Nam Cooperative Movement. It is organized at the central and provincial levels. The co-operative enterprises at the primary level are affiliated to the provincial cooperative alliance, which, federate into the central alliance. The cooperative alliance has been established in all 63 provinces throughout Viet Nam. VCA renders support services to cooperatives as well as implementing effective economic activities to steer and uplift the movement.
Viet Nam Women's Union (VWU) http://hoilhpn.org.vn/?Lang=EN	Viet Nam Women's Union (VWU) was founded in 1930, a non-profit organization that aims to raise capacity and knowledge, as well as improve the material and spiritual livelihood for women and promote gender equality. VWU has a membership of more than 13 million belonging to 10,472 local women's unions in communes and towns throughout the country. The organizational system of VWU is divided into four levels—Central, Provincial and Municipal (63 units), District (642 units), and Commune (10,472 units).

Source: Author's collection from institutional websites

3. Domestic policies

3.1. Price support measures

Since the reunification, the government has operated a **State Reserve** system for certain products. The current reserve is maintained for the purposes of preventing and overcoming the consequences of natural disasters and epidemics affecting people, plants or animals, and ensuring economic, social and national security. Stocks are held throughout the country under the responsibility of 22 Department of State Reserves, each covering 2-3 provinces. The annual quantity of paddy/rice to be brought into reserve is set by Prime Ministerial decision. This can be brought from farmers or traders, with a maximum price set by MOF.

In 2004, the policy of setting prices was abandoned and replaced with a more general commitment to stabilize market prices for essential goods and services when their prices abnormally fluctuate. Policy measures that could be employed to achieve price stabilization were:

- a) Adjusting the demand and supply of domestic goods and export/import goods, and/or adjusting the allocation of commodities between regions or localities;
- b) Purchasing or selling out the state reserve;
- c) Controlling goods in stock;
- d) Setting minimum prices or price brackets;
- e) Controlling price components;
- f) Subsidizing farm produce prices when the market prices drop too low, thus causing damage to the producers;
- g) Subsidizing prices of other important essential commodities and services.

Table 6. Agricultural-related products subject to price stabilization

Market level	1993-99	2004-08	2008-14	2014 onwards
Inputs	Fertilizers	Urea	Chemical fertilizers Plant protection chemicals Certain veterinary products* Certain animal feeds	Nitrogenous fertilizers Urea NPK fertilizers Plant protection chemicals Prophylactic vaccines for livestock and poultry
Farm level output	Paddy Sugarcane Coffee beans Rubber Cashew nuts	Paddy Sugarcane Coffee beans Cotton seed	Paddy	Paddy
Final consumption	Rice	Rice Ginned cotton	Rice Edible sugar Milk products	Rice Edible sugar Milk formula for children under 6 years of age

Source: OECD, 2015

A number of amendments were made in 2008 and 2014. First, changes were made to the price stabilization list, removing sugarcane, coffee beans and cotton seed, and so leaving only paddy. Second, changes were made in the definition of abnormal fluctuation, reducing the period over which prices were allowed to vary from 30 to 15 days, with the limit of 15% of price fluctuation for animal feeds and plant protection drugs and 20% for chemical fertilizers and certain veterinary drugs.

The obligation to register prices was initially limited to just SOEs. In 2010, this obligation was extended to all private enterprises producing, importing, distributing and/or selling goods on the price registration list. Moreover, the specific conditions were removed and greater discretion was given to government officials. State management agencies could now introduce measures when the price of a good increases or decreases faster than changes in production costs as determined by

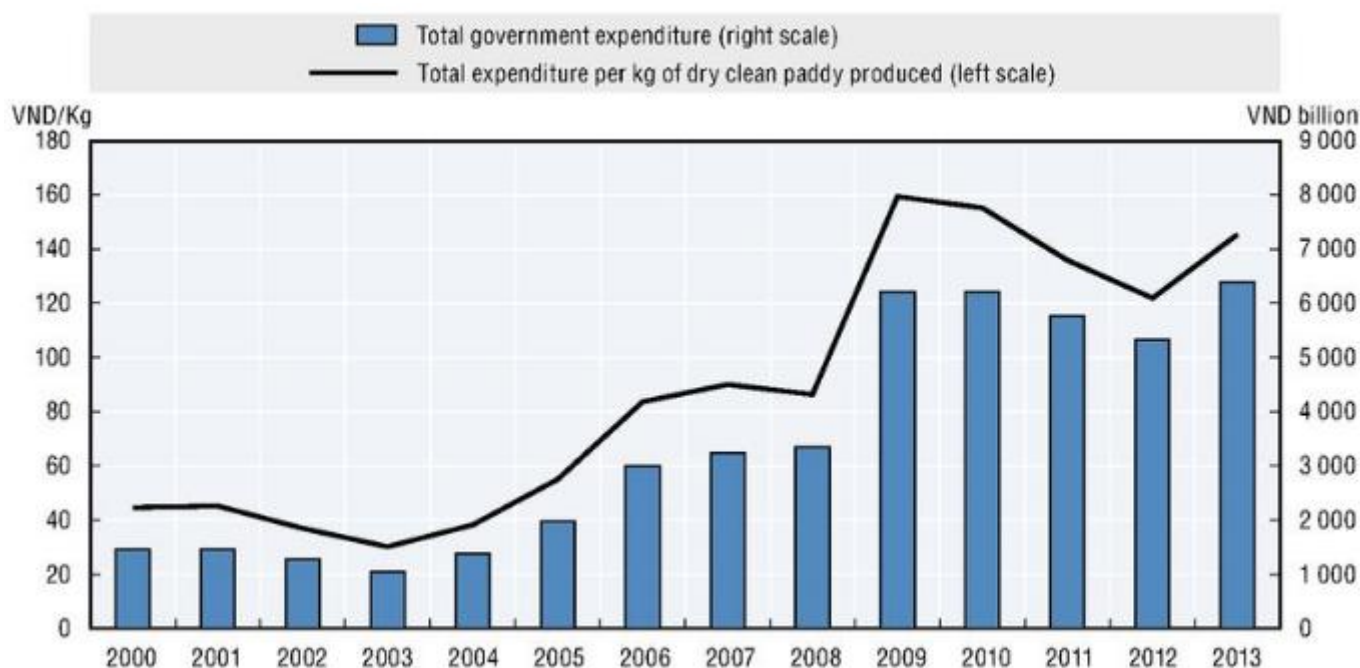
the agencies, or if the price fluctuations are considered groundless, or because a producer or trade abuses their market position.

3.2. Irrigation service fee exemption

Since 1963, an irrigation service fee (ISF) has been collected from farmers on behalf of the irrigation and drainage management companies (IDMCs) that manage the upper-level system by water user groups (WUG), which are responsible for administrating the distribution of water to farmers and maintaining the infrastructure below the upper-level system.

Since 2009, individuals and households in agricultural, forestry, salt and aquaculture production have been exempt from payment of the ISF. Funding from central and local government to IDMCs has been increased to offset the fall in ISF revenue, which previously covered about half of their costs (Barker et al., 2004). A review of the exemption decision identified a number of positive and negative outcomes (Cook et al., 2013). Framers gained on average VND 400 000 (USD 20) increase in annual net farm income. Using an average agricultural household income of VND 1.458 million (USD 70) per month, the saving represents 2% of annual income. IDMCs gained from having a more consistent source of funding. However, total central and local government expenditure on supporting operations and maintenance increased from VND 3.3 trillion (USD 203 million) in 2008 to over VND 6.2 trillion (USD 350 million) from 2009 onwards. Further, it has weakened the incentives for farmers to use water efficiently and for IDMCs to provide a quality irrigation service.

Figure 2. Expenditure on supporting irrigation operations and maintenance, 2000-13



Source: "Producer and Consumer Support Estimates", OECD Agriculture Statistics Database, 2014

3.3. Plant genetic and livestock breeding support

Since many of these programs are conducted at the provincial level, limited information is available. These forms of support have been introduced to encourage product diversification or to improve the quality of production. In more recent year, they have been used for disaster recovery and in case of disease outbreaks, in particular livestock disease outbreaks that has accompanied the expansion of the livestock industry. The domestic livestock industry comprises mainly small-scale or backyard farm operations, which have poor hygiene standards and are susceptible to epidemics. Disease outbreaks will

constantly feature as a challenge to the industry as long as it remains fragmented and low in technology and health standards (BMI, 2011). Aiming to control and eradicate these outbreaks, government approved compensations that encourage farmers to cull animals rather than sell them illegally on the market. In addition to compensating animals, government has introduced the provision of veterinary medicines and support for facilitating the recovery of agricultural production after disease outbreaks and natural disasters. MARD is responsible for determining the natural disasters and diseases that are supported; MOF provides funding from the state budget; and Provincial People's Committees implement the support and actively use local funds (Tran and Dinh, 2014a).

3.4. Programme 135

The Socio-economic Development Programme for Ethnic Minorities and Mountainous Areas (known as Programme 135) is the largest and most important poverty reduction programme targeted on ethnic minorities and remote areas. The programme has been extended in 3 phases, from 1998 to 2006, then to 2011 and to 2015. The initial phase consisted in infrastructure development, health centers, irrigation systems, water supply systems, markets, etc. In Phase II the programme gave greater emphasis to supporting agricultural production through capacity building and improved livelihood with a market-oriented point of view (agricultural extension services, distribution of inputs, equipments and extension services for post-harvest and processing activities). Phase III is building on improving access for poor and disadvantaged communes to preferential loans for investment in production.

3.5. Credit policies for farmers

Up until early 2000s, the government controlled credit availability and interest rates in all sectors of the financial market through the State Bank of Viet Nam (SBV). The ability for farm household to access commercial credit commenced in 1993 with the Land Law, which allocated LURCs to households and gave them the right to use these as collateral for bank loans, and with the establishment of the state-owned Viet Nam Bank for Agriculture and Rural Development (VBARD), also known as Agribank. A further financial reform directly affecting the agricultural sector was the establishment of the stand alone, non-profit Viet Nam Bank for Social Policies (VBSP), which objective is to support the government's poverty alleviation efforts through the provision of credits to disadvantaged people. Furthermore, the government introduced in 2009 a policy to provide agricultural producers with short-term concessional interest rate loans to purchase machines, mechanical equipment, facilities and materials in order to reduce investment costs, to improve production capacity and promote industrial development in rural areas. Access to subsidized credit has been provided since 2010 for the purposes of mitigating losses in agricultural production. Post-harvest losses are high in Viet Nam: 11-12% for paddy, 13-15% for maize, 20-22% for vegetables and fruits, 15% for coffee and 18-20% for cassava (MARD, 2014b). Preferential loans can be used to buy equipment to reduce post-harvest losses. They also offer preferential loans to develop projects of production and storage facilities for such purpose.

The above-mentioned policies are not as effective as anticipated for many reasons. Many farmers cannot access the credit support because of complicated and inconsistent procedures such as the requirement of submitting an invoice; the minimum local content requirement for machines is not realistic; to access the concession loans, enterprises have to sign contracts for production linkages, consumption of agricultural products and usage of agricultural mechanical services with cooperatives, households and individuals (Tran and Dinh, 2014a).

3.6. Agricultural insurance

Agricultural insurance markets are underdeveloped in Viet Nam. The high risk of natural disasters and epidemics mean that insurance premiums are quite high, out of reach for many farm households. A three-year pilot insurance programme was introduced in 2011 and provided through two state-owned insurance companies, Bao Viet and Bao Minh. The insurance premium is subsidized on a progressive scale: 100% for poor farming households, 80% for farming households just above the poverty line, 60% for other farming households, 20% for agricultural production organizations.

The pilot programme was implemented in 21 provinces, opened to paddy, livestock (buffalo, cows, pigs and poultry) and aquaculture (catfish and shrimps) producers, and covered a specific list of diseases (e.g. storms, floods, blue-ear pig

disease and foot-and-mouth disease). Payment of subsidies are handled directly by MOF with the insurance company and loss coverage payments are handled directly by insurance company with the insured party (JICA, 2012).

Table 7. Outcomes from the pilot agricultural insurance programme as at June 2014

	Number of participants	Value insured	Insurance fee paid by government	Compensation provided
Total	304 018	VND 7 748 billion (USD 370 million)	VND 394 billion (USD 19 million)	VND 702 billion (USD 33 million)
By type of agricultural production (%)				
Paddy	78	28	23	3
Livestock	20	35	21	2
Aquaculture	2	37	55	95

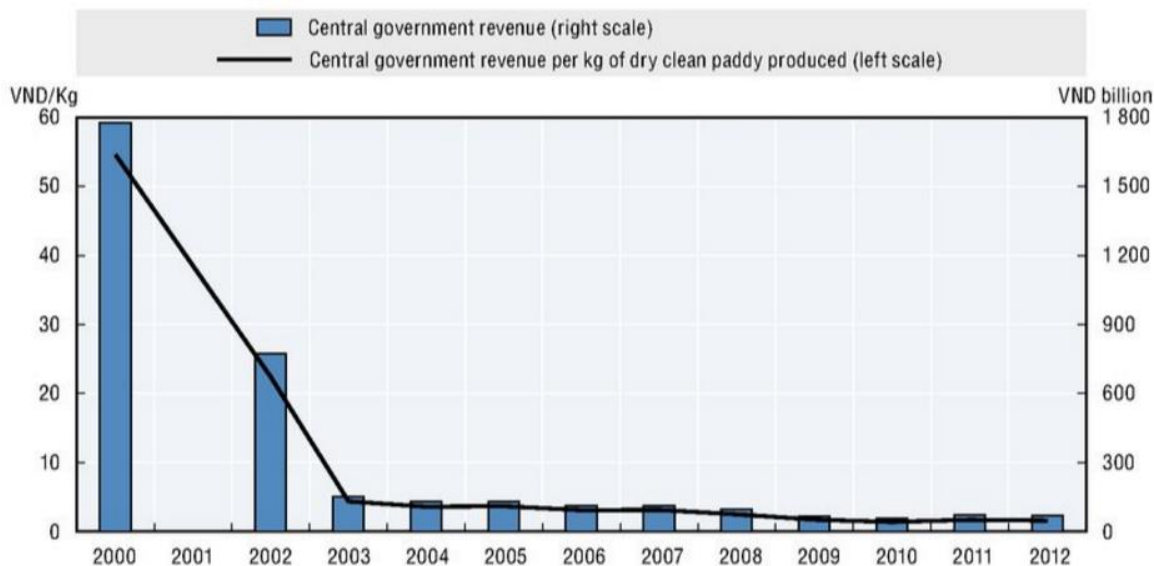
Source: MARD, 2014

Just over 304 000 households and one agricultural production organization participated in the pilot insurance programme. Poor households accounted for 77% of participants with near poor households accounting for a further 15%. While a full evaluation of the programme is underway, a number of problems have contributed to the relatively low take up of the scheme. These include the fact that many common diseases are not covered, the process of disease certification is confusing and the loss coverage payments are not high enough (Tran, 2014c).

3.7. Income support measures

In July 1993 an agricultural land use tax was introduced as the main mechanism of central government to tax farm income. In order to encourage agricultural production and support farmers, exemptions and reductions to the agricultural land use tax were introduced in 2003. The exemptions and reductions were then extended in 2010 out to 2020. Exemptions from the agricultural land use tax is provided for: agricultural land under the limits assigned by the government to both farm households and individuals; agro-forestry land under the land limits allocated to households from SOEs; and agricultural land, both under and above the land limits, for poor households and households located areas classified as having special difficulties. Reduction in the agricultural land use tax by 50% is provided for: organizations which manage and use agricultural land; and land holdings in excess of the land limits which are used for agriculture and forestry by households and individuals, including land allocated by SOEs. Reductions in land use taxes have been used to encourage commercial investment in agriculture and incentivize infrastructure development.

Figure 3. Revenue from agricultural land use tax, 2000-12



Source: General Statistics Office (GSO), www.gso.gov.vn/default_en.aspx?tabid=468&idmid=3&itemID=15443

3.8. Extension services

The government's agriculture extension system was officially established in 1993 by Decree No. 13/1193/ND-CP dated 2 March 1993, now repealed by Decree No. 02/2010/ND-CP dated 8 January 2010 and effective from 1 March 2010. The main objectives of the system are to:

- a) Raise producers' awareness through training in production and business knowledge and skills;
- b) Provision of services to assist farmers in carrying out effective production and business activities adapted to ecological, climate and market conditions;
- c) Contribute to restructuring the agricultural economy towards commodity production, higher productivity and quality as well as food hygiene and safety;
- d) Accelerate agricultural and rural industrialization, ensuring national food security, socio-economic stability and environmental protection.

The public extension system is organized into 5 levels: a Central-level National Agriculture Extension Centre (NAEC) within MARD, Provincial centers within their respective DARDs, District stations under the control of the provincial extension centre, Commune cadres, and Village/Hamlet collaborators and clubs.

NAEC was created in July 2003, when the Government reorganized some functions and organizational structure of MARD. Through this decree, the Government approved the reorganization of the former Department of Agriculture and Forestry Extension (DAFE), and separated the department into two agencies within MARD due to difficulties in serving the broad assignments: the Department of Crop Production and NAEC. According to the current regulations, the NAEC has the following responsibilities (Nguyen, 2012):

- a) Developing policies and mechanism of management for extension in agriculture, forestry, fishery, rural industry;
- b) Developing economic-technical cost-norms for extension works;
- c) Lead, organize and guide the transfer of advanced techniques through setting up demonstration models, disseminating information, training, providing services and international collaboration in related fields.

All 63 provinces have their own extension centers with a total of 2 694 staff, an average of 43 persons per center. At the district level there are 641 extension centers out of 703 districts, with 3 335 staff for an average of 5 persons per station. At the commune level, there are 7 804 workers, about 1 worker per commune. Village level data are not present for all regions. In total, there are about 30 000 people working, making an average of one public extension worker per 300 farming households. Expenditure on extension services amounts to about USD 3.80 per farming household, of which 80% comes from the local government.

Table 8. Government extension system by region, 2013

Variable	Region						Total
	Red River Delta	Northern midlands and mountainous areas	North Central and Central coastal areas	Central Highlands	South East	Mekong River Delta	
Agricultural land (000 ha)	771	1 596	1 882	2 000	1 355	2 067	10 211
Agricultural households (000)	1 750	1 789	2 215	743	537	1 833	8 867
Districts in region	129	141	172	61	69	131	703
Communes in region	1 946	2 254	2 416	593	468	1 270	8 947
Stations at the district level	107	135	158	58	53	130	641
Investment (million VND)	220 058	113 537	99 849	38 197	81 360	153 506	706 507
Central budget	19 753	27 697	16 797	5 717	3 052	18 346	91 362
Local budget	198 519	69 652	78 828	27 222	77 496	123 907	575 624
ODA	1 786	16 188	4 224	5 258	812	11 253	39 521
Staff	2 828	14 624	4 635	5 269	511	2 141	30 008
Provincial	799	376	535	180	222	582	2 694
District	440	1 032	647	413	178	625	3 335
Commune	1 589	3 102	1 403	701	111	934	7 840
Village/Hamlet	n.a.	10 114	2 020	3 975	n.a.	n.a.	16 139
Investment per household (USD)	5.97	3.01	2.14	2.44	7.19	3.97	3.78
Central budget per household (USD)	0.54	0.73	0.36	0.37	0.27	0.47	0.49
Local budget per household (USD)	5.38	1.85	1.69	1.74	6.85	3.21	3.08
ODA per household (USD)	0.05	0.43	0.09	0.34	0.07	0.29	0.21
Households per staff	619	122	478	141	1 050	856	295
Staff per commune	1.5	6.5	1.9	8.9	1.1	1.7	3.4

1. Agricultural land in 2011.

2. Agricultural households taken from GSO (2012), Results of the 2011 Rural, Agricultural and Fisheries Census.

3. Investment includes central and local government budget plus ODA.

4. Expenditure and staff include those involved with forestry and fisheries extension.

Source: *MARD 2014, Statistical Yearbook of Agriculture and Rural Development 2013.*

The current extension activities are focusing on the following content:

- Setting up models demonstrating advanced techniques for transferring to farmers. The models concentrate on introducing new varieties, techniques/ technologies.
- Organizing training farmers. Not all new techniques are demonstrated in the field, therefore training is a means to transfer them quickly to farmers. Training methods are face-to-face training, training via TV, radio, brochures, CD, VCD, DVD, and via websites. Training of trainers (ToT) is also an effective training method to expand the number of skilled extension practitioners.
- Organizing science and technology forums, specific festival and exhibitions, where farmers can exchange directly with scientists, managers and examples of successful cases of applying new technology.

Viet Nam extension system, especially the government extension still has some limitations as follows:

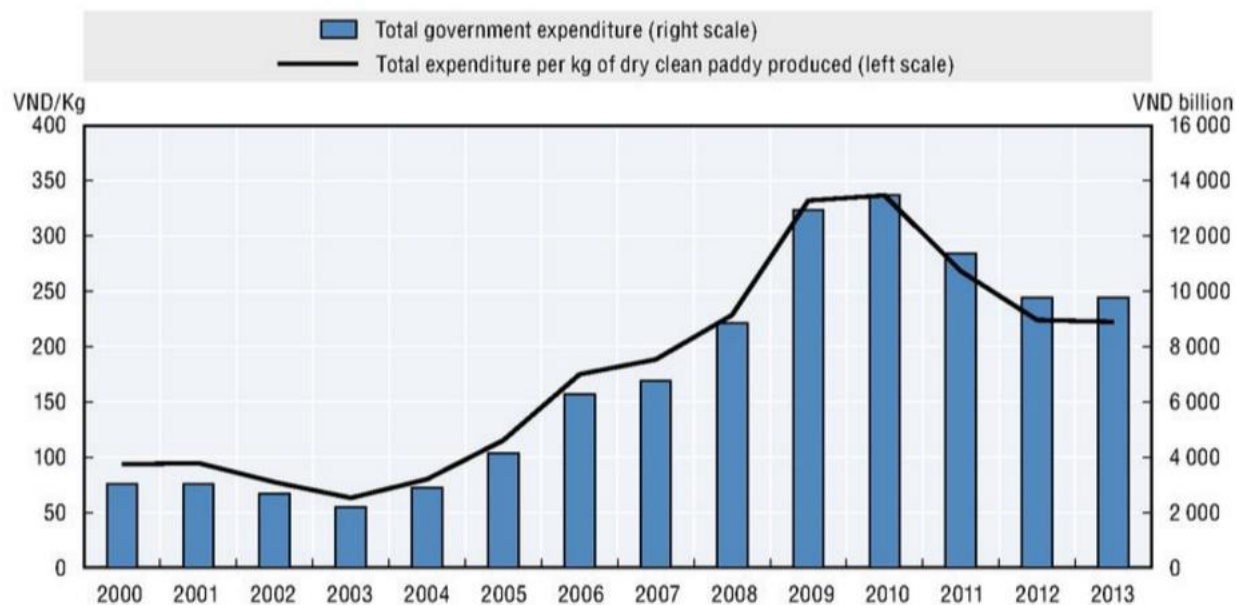
- Human resources are lacking in both quantity and quality.
- The extension workers specialties not yet meet the requirements for improving production to achievable levels. Most of them are specialized in crops and husbandry; other fields are lacking.
- Extension has focused mainly on hunger alleviation and poverty reduction. It has not yet really developed to provide support in the processing and marketing of products. This is a reason why small and medium farm owners and agricultural enterprises have received very limited attention and services from Government extension departments.
- The extension methods do not yet satisfy the diversified demands of the different farming systems, the differences in terms of knowledge and culture of farmers in many varied localities.
- The current extension policies and program is mainly focused on the government extension system, extension without any payment. The linkages among extension – research - education are not yet well developed.
- The system of monitoring and evaluation of extension activities is still lacking and working improperly. The involvement of local authorities is still very limited. Farmers are not yet involved in the extension works at the stage

of planning, therefore extension activities do not really meet the requirement of farmers as well as the reality of the agricultural production.

3.9. Irrigation and flood protection

Irrigation has played an important role in the success of Viet Nam's raising agricultural production. According to FAO, the irrigation potential in Viet Nam is 9.4 million ha, of which close to 50% (4.6 million ha) has been developed. Investment in irrigation and flood protection has been a major focus of the government since the 1970s, with around 80% of the capital investment funds available to the agriculture sector allocated to improving and expanding irrigation, and protecting flood prone areas from damage.

Figure 4. Expenditure on irrigation capital development, 2000-13



Source: OECD (2014), "Producer and Consumer Support Estimates", OECD Agriculture Statistics Database

MARD has the primary responsibility for irrigation management, and it works with MONRE and the National Water Resources Committee (NWRC). Since its establishment in 2002, MONRE has taken over responsibility from MARD for the management of water resources in general. The NWRC was established in 2000 to solve conflicts over water resources management between ministries and between ministries and provinces. MARD is also responsible for dykes, flood and storm management, and rural water supply.

In 2014 an irrigation restructuring scheme was introduced with the following objectives:

- a) Improving efficiency in the irrigation sector to contribute to agricultural restructuring towards greater added value and sustainable development;
- b) Meeting the prevention and response to climate change;
- c) Contributing to the modernization of agricultural and rural infrastructure and new rural development.

The major solutions that are being implemented are innovations in planning, including irrigation planning associated with agricultural restructuring, the application of water-saving irrigation technologies, and the reorganization of agricultural production.

3.10. Storage infrastructure

To support the temporary storage policy, the government has encouraged the expansion of rice storage capacity of enterprises. In 2009, the warehouse storage capacity was only 1.5 million tonnes compared with annual paddy production of over 20 million tonnes. The objective of this improvement was to increase the returns from rice exports by giving enterprises more flexibility as to the timing of shipment and lifting the quality of stored rice.

3.11. Consumer support

State Reserves of rice are used to provide direct food support to households. For example, poor households involved in forestation and forest protection or poor households in border areas are granted 15 kg rice/person/month until they can be self-sufficient in food. This is one of the direct support policies for the poor, but the government lack of measures to identify the right beneficiaries and provide the necessary quantity (MARD, 2014b).

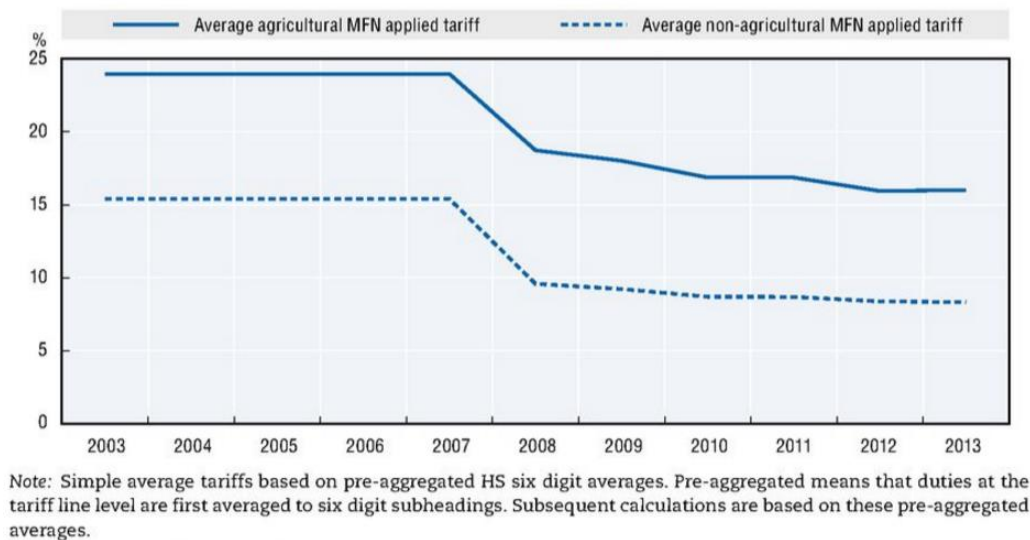
4. Trade policies affecting agro-food trade flows and agricultural commodity prices

4.1. Import policy measures

4.1.1. Tariffs

Since WTO accession in 2007, the simple Most Favored Nation (MFN) applied tariff on agricultural products has declined from 25% to 16.2% in 2013.

Figure 5. Average MFN applied tariffs for agricultural and non-agricultural commodities, 2000-13

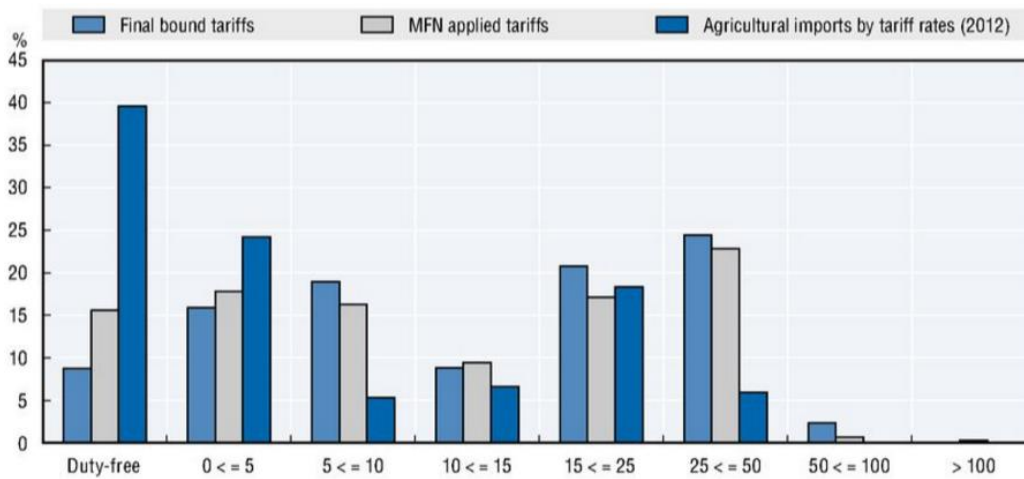


Source: WTO Tariff Download Facility, <http://tariffdata.wto.org/Default.aspx>

While tariff protection in Viet Nam has fallen, it is still higher than the overall simple average MFN applied tariff of 9.5% for agricultural products, and almost double the 8.3% average for non-agricultural products (see Annex 2).

One-third of agricultural MFN applied tariffs within the range of 0-5%. Almost two-third of agricultural imports enter Viet Nam at these low tariff rates, with almost 40% of that entering duty-free. At the other extreme, around one-quarter of MFN applied and final bound agricultural tariffs are 25% or more. Only 6% of imports in 2012 entered Viet Nam through these higher tariff lines.

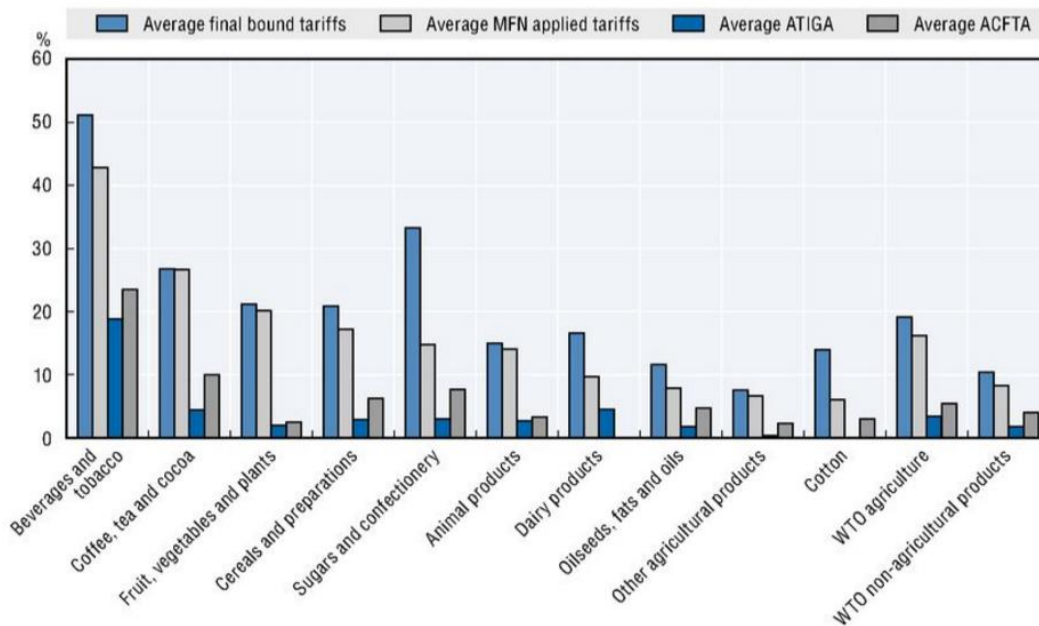
Figure 6. Frequency distribution of agricultural final bound and MFN applied tariff lines and imports by tariff rates, 2013



Source: WTO Tariff Profile of Viet Nam 2014, <http://stat.wto.org>

Among the agricultural product categories attracting the highest MFN applied tariffs are beverage and tobacco, coffee, tea, cocoa, fruit, vegetables and plants. Within these products, MFN applied tariffs are highest for cigarettes and cigars (100-135%) and wine and spirits (45-55%). An MFN applied tariff of 40% applies to a range of commodities including meat of poultry, turkey and duck, tea (green and black), grapefruit, milled rice, refined sugar, and many types of prepared and preserved fruits and vegetables.

Figure 7. Average bound, MFN applied, ATIGA and ACFTA tariffs by product groups, 2013



Note: ATIGA – ASEAN Trade in Goods Agreements; ACFTA – ASEAN China Free Trade Agreement.

Source: Final bound and MFN applied tariffs: WTO Tariff Profile of Viet Nam 2014, <http://stat.wto.org>

The import tariff is 0% for most materials and inputs associated with agricultural production, such as fertilizers, corn and rice seeds. The MFN applied tariff rate for most agricultural machinery (tractors, harvesting machines, seeders, manure spreaders, machines for cleaning, sorting or grading, etc.) is 5%, with the exception of ploughs and Harrows (20%). All

agricultural machinery is duty-free from ASEAN members. The government has implemented these low import taxes for agricultural inputs with the purpose of supporting agricultural production.

4.1.2. Tariff-rate quotas

Under its WTO accession commitments for agriculture, Viet Nam provides tariff-rate quotas (TRQs) for eggs, sugar (raw and refined), and unmanufactured tobacco and tobacco refuse.

Table 9. Tariff-rate quota commitments for eggs, sugar and tobacco

Product	Initial quota quantity 2007	Volume commitment	Final quota quantity	In-quota tariff rate	Out-of-quota final tariff rate	Administration method
Birds' eggs, in shell, fresh, preserved or cooked	30 000 dozen	5% increase per year	Infinity	40%	80%	Quotas allocated to firms that own a business registration certificate and who have actual import demand
Cane or beet sugar and chemically pure sucrose, in solid form	55 000 tonnes	5% increase per year	Infinity	25% for cane, 50% for beet sugar and 60% for sucrose	85% for cane, 100% for beet and 85% for sucrose	Allocated to end-users based on past performance
Unmanufactured tobacco, tobacco refuse	31 000 tonnes	5% increase per year	Infinity	30% except 15% for tobacco stems	80-90%	Quotas allocated to end-users who have cigarette-producing permits

Source: WTO 2013, Trade Policy Review of Viet Nam; Report by the Secretariat, WT/TPR/S/287/Rev.1

According to Viet Nam's WTO Goods Schedule, the TRQ volumes for all three groups of products must increase by 5% annually without any upper limit. The size of the annual import TRQ is fixed by MOIT, whereas the tariff rates for out-of-quota imports are determined by MOF. TRQs are allocated to end-users (WTO, 2013).

4.1.3. VAT rates and other duties on imports

According to the Law No. 13/2008/QH12 dated 3 June 2008 and applied since 1 January 2009, there are three VAT rates: 0%, 5% or 10%, with 10% being the standard rate. The zero rate applies to exports of goods and services, and international transportation. The 5% rate applies to a select group of essential goods and services including many related to agricultural production: clean water; fertilizers, insecticides and pesticides; feed for cattle, pigs and poultry; special purpose machinery for agricultural production such as ploughs, harrows and harvesters; unprocessed products of cultivation, husbandry and forestry; sugar and sugar by-products; semi-processed cotton; preliminary processed rubber latex; and fresh food (World Bank, 2014).

A number of agricultural related goods and service are VAT exempt including the main outputs from farming which have not yet been processed into other products or which have only been semi-processed by organizations or individuals self-producing and selling such products, and products at the stage of importation. Domestic raw and semi-processed agricultural production has been VAT exempt since the tax was first introduced in 1999. As part of its WTO commitments, Viet Nam extended the exemption to include imports from 1 January 2006 (WTO, 2006). Other goods and services not subject to VAT of relevance to agriculture include certain inputs, specifically animal breeds and plant variety products.

4.1.4. Import licensing and state trading

The importation of various goods is subject to "line management", i.e. import licenses are issued by MOIT but other ministries regulate imports. The purpose of this system is to enforce minimum quality or performance standards for goods related to human, animal, or plant health; local network compatibility (telecommunication equipment); monetary security; or cultural sensitivities. Under the system, MARD regulates the importation of veterinary medicines, pesticides, plant and animal strains, animal feeds, fertilizers and genetic sources of plants, animal and micro-organisms used for scientific purposes.

Table 10. Imported goods subject to line management licensing by MARD

Description	Form of management
Veterinary medicines and materials for making veterinary medicines	TBT/SPS license
Biological products for veterinary use registered for first-time use in Viet Nam	TBT/SPS license
Pesticides and materials for making pesticides excluded in the List of pesticides allowed to be used in Viet Nam	Automatic license
Pesticides and materials for making pesticides included in the List of pesticides allowed to be used in Viet Nam	Automatic license
Plants and animals strains, and various types of insects not available in Viet Nam	TBT/SPS license
Animal feeds and materials for producing animal feeds newly used in Viet Nam	TBT/SPS license
Fertilizers newly used in Viet Nam	TBT/SPS license
Genetic sources of plants, animals, and micro-organisms used for scientific purposes	TBT/SPS license
Wild animals and plants subject to import control according to CITES Convention	Automatic license

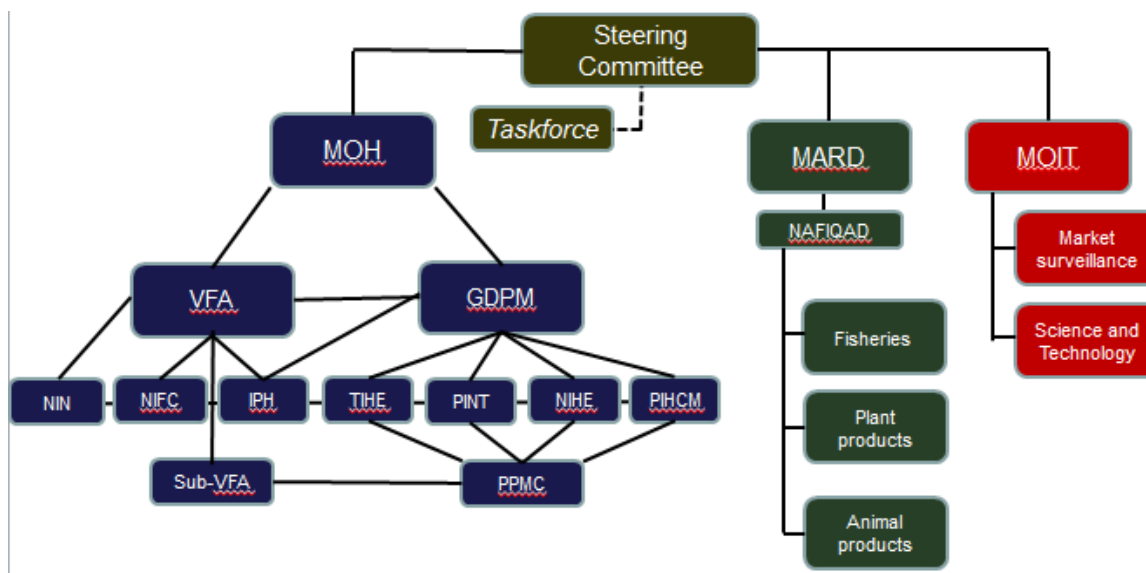
Source: WTO 2013, Trade Policy Review of Viet Nam; Report by the Secretariat, WT/TPR/S/287/Rev.1

4.1.5. Food safety and quarantine measures

Viet Nam undertook to comply with the requirements of the Sanitary and Phytosanitary (SPS) Agreement upon its accession to the WTO without recourse to any transitional arrangements. Since joining the WTO, Viet Nam has imposed different SPS measures on meats, fresh fruits and vegetables, feed, dairy, processed food, and other food imports from different countries. Further, Viet Nam has agreed to equivalence of foreign food safety measures, it has not fully adopted standards provided by international organizations. For example, Viet Nam maintained protective measures against bovine spongiform encephalopathy (BSE) on beef imports from the United States that contained stricter restrictions than the science-guided measures recommended by the OIE (Arita and Dick, 2014). Responsibility for state management of food safety rests with MARD, MOIT, and MOH. Together they oversee:

- The conformity to technical regulations for food safety regulations;
- Safety requirements for genetically modified food;
- Granting and withdrawing food safety certificates for establishments that meet food safety requirements;
- State inspection on food safety for imported and exported food;
- Labeling of products.

Figure 8. Multi-agencies food safety in Viet Nam



Source: Food Safety Working Group, 2016

Despite these efforts to set in place a legal framework and structure for food safety obligations, further work is required to effectively implement the regulatory regime. There are issues associated with the system of legal documentation and technical regulations, the organizational system and human resources (Dao T. A., 2014). The large number of legal documents relating to food safety, about 400 documents issued by the central government and ministries and about 1 000 documents issued by local governments, result in overlap and lack a clear focus. There is poor coordination between agencies, risk analysis and identification systems, both at central government level and between central and local government (Tran and Dinh, 2014a). The capacity of testing agencies is limited, leading to inconsistent enforcement that adds to uncertainty for foreign producers (Arita and Dyck, 2014).

Box 1. Implementation bottlenecks in developing countries for food safety issues

A critical bottleneck for implementation of a risk-based food safety control system in developing countries is the convoluted structure of the food safety administration system. While many OECD countries have separate agencies responsible for food safety surveillance at various stages of the value chain, the distinction of developing countries is that the lack of experience of inter-sectoral collaboration leads to inefficiencies in the food safety control system. The observations in Viet Nam show that separate roles of each of the three ministries lead to also a separate implementation of food safety control along the value chain. For example, under its areas of state management functions, MOIT issues specific regulations on standards of imported foods, beers, dairy products, and cooking oil. At the same time, MOIT is in charge of monitoring and inspecting all products for sale in markets and supermarkets (except the wholesale markets). MOIT has about 7,000 market inspectors tasked to control and monitor all types of markets throughout the country. The Department of Science and Technology is in charge of coordinating and developing related policies. That department works with three other departments of Market Management, Domestic Markets, and Import and Export to execute MOIT's functions and responsibilities in food safety aspects. MOIT has identified three key challenges for food safety within its area of jurisdiction: (i) Household-based and small-scale liquor production. 70% of liquor producers in the country are from household-based and small-scale sources. Out-of-date refinery technologies and unhygienic practices in liquor and wine making (from rice, corn, cassava, etc.) result in liquor with high degrees of ethanol, and other poisonous substances. This is considered as high risk area that needs urgent actions for mitigating food safety risks. Such household-based liquor production is very popular throughout the country, because its by-products are used as animal feed.(ii) Food safety in markets and supermarkets. There is a strong need to strengthen the capacity of market inspection (with rapid test equipment² and training) for their daily work. (iii) Increase the capacity of laboratories.

Source: FAO, 2015

Over the last years, food safety issue has raised concerns among government ministries and international development organizations. For a deeper inside of this important issue see Annex 3.

4.1.6. Standards and labeling

Viet Nam undertook to comply with the obligations of the Technical Barriers to Trade (TBT) Agreement from the date of its accession to the WTO. Since its accession, Viet Nam has sent over 50 TBT notifications of regular measures covering a variety of products. At the end of 2012 there were 6 800 Vietnamese standards (up from 25% in 2005) (Tran and Dinh, 2014a).

² It has been a common experience from other countries (e.g. some provinces in China, Kazakhstan) that market supervision should be based on rapid tests. Assumptions by regulatory agencies that rapid tests will keep unsafe food out of markets contain several flaws: (i) such rapid testing equipment, if available, only has very specific limited use, (ii) end-product testing is the opposite strategy of a risk-based system, (iii) major risks in the marketplaces relate to hygienic and sanitary conditions of facilities.

4.2. Export policy measures

4.2.1. State trading and export taxes

Before 1989 the state held the monopoly position in foreign trade. In the period 1975-80 the Ministry of Foreign Trade established Import and Export Companies, and only these companies were allowed to trade. During 1981-88 foreign trade was decentralized, so companies which belonged to other ministries and local governments were allowed to trade. In 1989 the monopoly of the SOEs was broken. Private trading companies were allowed to engage in trade, but their activities were severely impeded because of import and export licenses were required. In 1998, the licensing requirements for trading were largely abolished, and since 2001 private companies and SOEs have been allowed to export most products without any license. While the legal control of SOEs over exports has been eliminated, they still exert a high degree of influence over the export of important agricultural products like rice, coffee, rubber and tea.

In accordance with the current Law on Export and Import Duties, in effect since 1 January 2006, export taxes are levied on just a few agricultural related products. Cashew nuts in shell are currently zero-rated, while duty rates of 0-10% apply to raw hides and skins, and 0-5% to rubber.

4.2.2. Export subsidies and promotion

A national trade promotion programme has been in operation since 2005. The programme provides funds for a wide range of trade promotion activities, such as hiring domestic and foreign experts for advice and assistance on export development or product quality improvements, the organization of trade fairs and exhibitions, sponsorship to participate in trade events, and to carry out surveys or market investigation (Tran and Dinh, 2014a). In addition to it, the Viet Nam Development Bank (VDB) provides export credits, investment credit guarantees, and export project performance security along with implementing state policies with respect to the financing of investments, post-investment assistance, and investment credit guarantees (WTO, 2013).

In recent time, the government has launched some agricultural specific measures to facilitate greater access to commodity markets and trade promotion. Since 2011, the government has provided credit facilities for exporters of tea, pepper, cashew nuts, processed vegetables (box, fresh, dried, pre-processing, fruit juice), sugar, meat, poultry, coffee, seafood and handicrafts such as rattan, bamboo and wicker products. Effective from January 2014, the government supports 50% of the cost of advertising on the mass media, 50% of the cost for fair exhibitors in the country, 50% of the cost for obtaining market information and other services from the state promotion agencies.

4.3. FTA commitments and economic integration process

Viet Nam has progressively liberalized its economy over the past 3 decades. Progress can be divided into two distinct periods. The first was 1986–2000 when the focus was moving from a subsidized and bureaucratic centrally-planned economy to a multi-component commodity production economy. The Doi Moi initiative kicked off reform efforts in 1986. Within 10 years, Viet Nam had joined ASEAN and applied for World Trade Organization (WTO) membership.

During this initial period of liberalization, Viet Nam became more active in regional economic integration as the two processes of economic reform and integration developed in parallel. In this way, economic integration has motivated domestic reform and in return domestic reform has been the basis for promoting sustainable integration. In Viet Nam's second period of liberalization from 2000 onward, the goal has been to build Viet Nam into a socialism-oriented market economy. This period has been characterized both by greater international involvement via the WTO and also greater participation in trade agreements in the region.

Accession to the WTO posed several difficulties for Viet Nam. First, the accession process required Viet Nam to make substantial institutional changes to the domestic legal structure to achieve compliance with WTO rules, especially with regard to liberalization of trade in services. This was complicated by a lack of bureaucratic capacity and technical, administrative, and

human resources. As a result, it was not until January 2007 that Viet Nam officially became a member of the WTO. In this phase of liberalization, particularly after 2007, Viet Nam has become a more active participant in regional negotiations. This trend can be seen with the rise of independent bilateral FTAs (ADB, 2014).

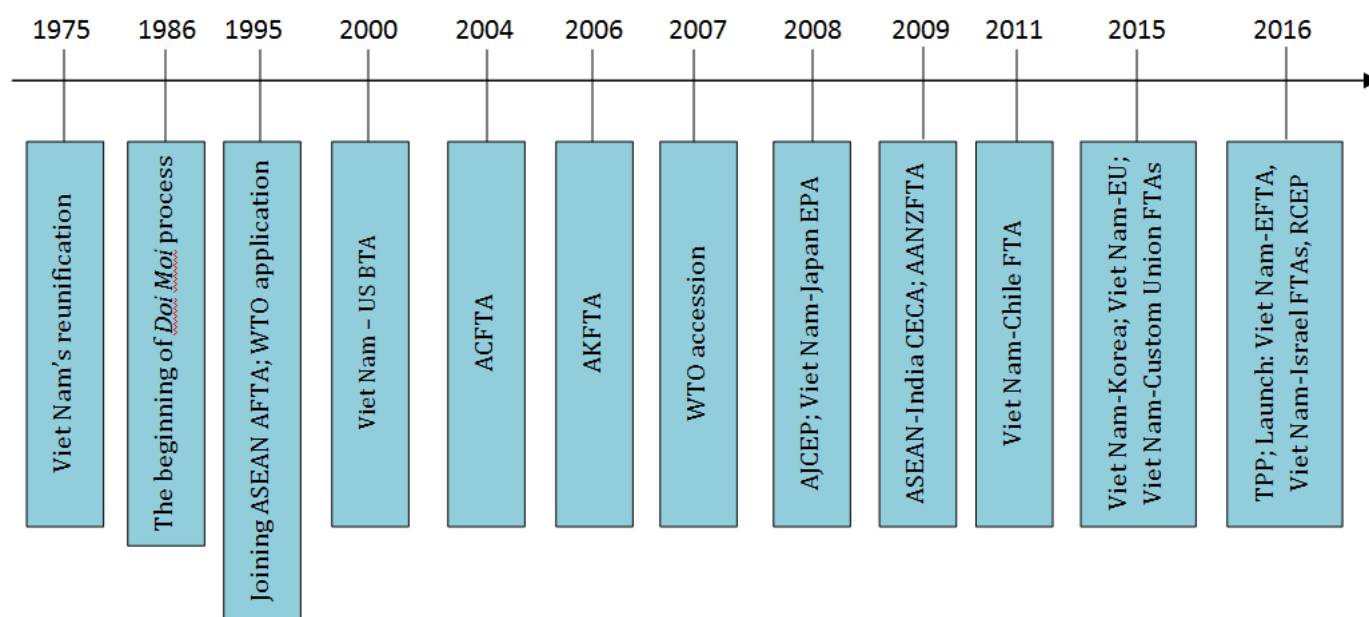
Table 11. Viet Nam participation in FTAs

Acronym	Name	Members	Year into force
AFTA	ASEAN Free Trade Area	Brunei Darussalam Cambodia Indonesia Lao PDR Malaysia Myanmar Philippines Singapore Thailand Viet Nam	Signed: 28-01-1992 In Effect: 01-01-1993
ACFTA	ASEAN-People's Republic of China Comprehensive Economic Cooperation Agreement	ASEAN Members China, People's Republic of	Signed: 29-11-2004 In Effect: 01-07-2005
AKFTA	ASEAN-[Republic of] Korea Comprehensive Economic Cooperation Agreement	ASEAN Members Korea, Republic of	Signed: 24-08-2006 In Effect: 01-06-2007
AJCEP	ASEAN-Japan Comprehensive Economic Partnership	ASEAN Members Japan	Signed: 14-04-2008 In Effect: 01-12-2008
Japan-Viet Nam EPA	Japan-Viet Nam Economic Partnership Agreement	Viet Nam Japan	Launched: 01-01-2007 Signed: 25-12-2008 In Effect: 01-10-2009
AIFTA	ASEAN-India Comprehensive Economic Cooperation Agreement	ASEAN Members India	Signed: 13-08-2009 In Effect: 01-01-2010
AANZFTA	ASEAN-Australia and New Zealand Free Trade Agreement	ASEAN Members Australia New Zealand	Signed: 27-02-2009 In Effect: 01-01-2010
VCFTA	Viet Nam-Chile Free Trade Agreement	Viet Nam Chile	Launched: 01-10-2008 Signed: 01-11-2011 In Effect: 01-01-2014
[Republic of] Korea-Viet Nam FTA	[Republic of] Korea-Viet Nam Free Trade Agreement	Viet Nam Korea, Republic of	Launched: 03-09-2012 Signed: 05-05-2015 In Effect: 20-12-2015
Viet Nam-Customs Union of Russia, Belarus and Kazakhstan FTA	Viet Nam-Customs Union of Russia, Belarus and Kazakhstan Free Trade Agreement	Viet Nam Belarus Kazakhstan Russia Federation	Launched: 27-03-2013 Signed: 29-05-2015 In Effect: Not yet
EVFTA	European Union- Viet Nam Free Trade Agreement	Viet Nam EU Members	Launched: 08-10-2012 Signed: 02-12-2015 In Effect: Not yet
TPP	Trans-Pacific Partnership	Viet Nam Australia Brunei Darussalam Chile Japan Malaysia New Zealand Peru Singapore United States	Launched: 15-03-2010 Signed: 04-02-2016 In Effect: Not yet
Viet Nam-EFTA FTA	Viet Nam-European Free Trade Association Free Trade Agreement	Viet Nam Iceland Liechtenstein Norway Switzerland	Launched: 05-07-2012 Signed: Not yet In Effect: Not yet

RCEP	Regional Comprehensive Economic Partnership	Viet Nam Australia Brunei Darussalam Cambodia China, People's Republic of India Indonesia Japan Korea, Republic of Lao PDR Malaysia Myanmar New Zealand Philippines Singapore Thailand	Launched: 09-05-2013 Signed: Not yet In Effect: Not yet
VIFTA	Viet Nam-Israel Free Trade Agreement	Viet Nam Israel	Launched: 03-12-2015 Signed: Not yet In Effect: Not yet

Source: Author's collection from ADB <https://aric.adb.org/fta-country> and WTO <http://wtocenter.vn/fta>

Figure 9. The Economic Integration Process of Viet Nam



Source: Adapted from ADB (2014)

The rise of Viet Nam's participation in FTAs occurred as a natural progression in its process of liberalization, which began as a function of Viet Nam's participation in ASEAN activities. Initially, Viet Nam relied on ASEAN to direct regional integration initiatives. In recent years, Viet Nam has begun pursuing FTAs independently of ASEAN. This is partly a result of Viet Nam's reclassification by the World Bank as a lower middle income country in 2009, with Viet Nam no longer identifying itself with low income countries.

International economic integration is the core content through the country reform. In recent years during the implementation of guidelines and policies of the Party on international integration, the international economic integration of Viet Nam has achieved stable results. The integration is expected to create opportunities and bring positive results for agriculture and rural development (ISGMARD, 2015).

Viet Nam started implementing **ATIGA** since 1999 and will have to reduce import tariffs for most tariff lines down to 0% in 2015, 7% of tariff lines will be flexible to 2018. The principle of ATIGA commitment development is that ASEAN countries must grant each other preferential rates which are equivalent or more favorable than the preferential rates for the partner countries of FTA. ATIGA entered the stage of deep reduction and removal on tariff lines under the principle signed by relevant parties since 2015.

ACFTA committed to reduce 90% of tariff lines down to 0% by 2018. The Early Harvest Programme in ACFTA has been implementing tariff reduction since 2004 and tariff removal in 2008 (including most of the agricultural, fishery products from Chapter 1 - 8 in Import Tariff such as animal, fresh seafood, vegetables, fruits, beans). Viet Nam reduced the tariff down to 0% in 2008, 61% of tariff lines in China and ASEAN was reduced to 0% in 2006. About 80% of Vietnamese tariff lines has been reduced to 0% from 2006-2015, some commodities are flexible to 2018.

AIFTA committed to set 78% of tariff lines down to 0% by 2020. AIFTA will complete the first phase by 31st December 2017 by reducing 71% of tariff lines to 0%. According to AITIG, tariff reduction roadmap is distinguished into five groups with different tariff reduction period and rate, including Normal track (NT), Sensitive List (SL), Highly Sensitive List (HSL), Special Products List (SPL), and General Exclusion List (GEL). Viet Nam can follow a longer tariff reduction (5 years) compared to the ASEAN-6 and India. With the request of Viet Nam, India agreed to reduce the tariff to 45% for coffee and black tea, and 50% for pepper by 31st December 2018.

Under **AKFTA**, 90% of tariff lines have been reduced since 2007 will be removed by 2016, some tariff lines will be flexible to 2018. Particularly, Viet Nam must cut 50% items in General List (GL) down to 0-5% on 1st January 2013, 90% items on 1st January 2016, 95% items on 1st January 2016 and 100% items on 1st January 2018.

AJCEP was signed in 2008. This is a comprehensive economic agreement in trade of goods, services, investment and economic cooperation. AJCEP committed to reduce 90% of tariff lines to 0% in the 2nd Quarter/2024 and end the first phase on 31st March 2020, when 76.2% of tariff lines will be reduced to 0%.

AANZFTA committed to reduced 91% of tariff lines to 0% by 2020. AANZFTA will end its first phase on 1st January 2018, when 85% of tariff lines will be cut down to 0%. *Agri-food and seafood 2015*: 117/1539 lines are 0%, 332 lines are 5% (living animals and animal products, lamb, poultry and byproducts, honey, fruits and vegetables), 680 lines are 10% (pork, fish, crustaceans and molluscs, poultry eggs, vegetables and fruits, coffee, tea, Hom-Mali Thai rice, sugar). *By 2018*, 176 lines > 10% (including meat and poultry byproducts, fresh or chilled fish, preparations from meat and fish), 145 lines are 4-5%. *Forest products 2015*: 68/149 lines are 0% 2018: 148/149 lines will be 0%. According to AANZFTA, Viet Nam committed to remove 90% of tariff lines by 2018-2020 under NT; 7% of total tariff lines under SL, tariff rate will be reduced to 5% by 2022, and tariff rate under HSL will be reduced to 7-50% by 2022. GEL consisted of 3% of total tariff lines. Australia, New Zealand and ASEAN-6 countries: 90% of tariff lines will be 0% by 2015, some of them will be flexible to 2020.

The Viet Nam-Chile Free Trade Agreement (**VCFTA**) was signed in November 2011 and officially took effect since 1st January 2014. According to this Agreement, Viet Nam and Chile will end the first phase on 1st January 2024, when 41% of the tariff lines will be reduced to 0%.

As first bilateral FTA that Viet Nam has signed, **VJPEA** has a comprehensive range, including the regulations on trade in goods, services, investment, intellectual property, competition, government procurement and other economic cooperation. Japan committed to removed tariffs for 83.8% of Vietnamese exported agri-food in 10 years. This is also the highest EPA commitment in ASEAN EPAs. Vietnamese products under highest preference by Japan (compared to other ASEAN countries) include honey, ginger, garlic, lychee, durian, shrimp and crab. According to the statistics, 23 out of 30 top agricultural-forestry-fishery products from Viet Nam to Japan will be under 0% tariff rate immediately or within 10 years. *Agri-food and seafood 2015*: 93 of tariff lines are 5-10% (fresh frozen and chilled meat of cattle, pigs, chicken by-products, poultry, some kinds of fruits and vegetables, flour, corn flour, animal and plant fats, edible preparations) ; 902 lines are 10-25% (beef, pork, fresh chicken, frozen and chilled chicken, whole chicken, headless or cut pieces chicken, ornamental fishes, tuna, other sea fishes, freshwater fishes, poultry eggs, milk and dairy products, tropical vegetables and fruits, coffee, tea and its preparations, grain

and its preparations, milling fragrant rice and many kinds of processed seafood); 35 lines are 25-45% (semi-processed seafood, steamed rice, instant coffee) and 41 lines are not yet committed to be reduced (poppy seeds, sugar cane, sugar beet, tobacco leaves and stems). 2018: 160 lines will be 5-10%, 582 lines will be 11%-under 25%, 19 lines will be 25-45% [frozen seafood (excluding fillet), condensed milk or cream, other sauces].

VKFTA reached the negotiation conclusions in 2014. The contents of the Agreement include regulations for Trade in goods, Trade in Service, investment, intellectual property, Food safety and Sanitary and Phytosanitary measures (SPS). The Agreement also provided rules of origin, customs facilitation, trade remedies, Technical Barriers to Trade (TBT), E-commerce, competition, economic cooperation, institution and legality, etc. As part of the Agreement, Korea will remove tariffs for Viet Nam 11,679 of tariff lines (accounting for 95.44% of tariff, equivalent to 97.22% of total import turnovers from Viet Nam to South Korea in 2012). Meanwhile, Viet Nam will remove 8521 of tariff lines for Korea (accounting for 89.15% of tariff, equivalent to 92.72% of total import turnovers from Korea to Viet Nam in 2012).

The **Viet Nam-Custom Union of Russia, Belarus and Kazakhstan Free Trade Agreement** has strategic meaning which opened a new page in the cooperation between Viet Nam and the Asia-Europe Economic Union generally and other member countries particularly. Being officially launched in Ha Noi on March 28th, 2013, after two years of negotiation and finalizing internal approval, the Parties signed a comprehensive FTA with high level of commitment, ensuring benefit balance with concrete condition of the parties taken into account. The Agreement covers the programs on Trade in Goods, Rules of Origin, Trade Remedies, Trade in Services, Investment, Intellectual Property, Food safety and Sanitary and Phytosanitary measures (SPS), Customs Facilitation, TBT, E-Commerce, Competition, Institution and Legality. According to the initial assessment of the Union, after the agreement takes effect, export and import turnover of both parties will reach \$10-12 billion by 2020 (about \$4 billion in 2014). According to the estimate of Viet Nam, export turnover from Viet Nam to the Alliance will increase by 18-20% annually.

EVFTA has 99% of import tariff lines removed within 7-10 years. The main contents of EVFTA are related to agricultural commodities. Once EVFTA takes effect, EU will remove import tariff for about 85.6% of tariff lines. After 7 years, it will be 99.2% of tariff lines. For the remaining commodities, EU committed to grant Viet Nam the tariff quota, in which, the import duty is 0%. For seafood (except canned tuna and fish ball): EU will remove completely the import tariff for Vietnamese products within 7 years after the Agreement takes effect. For canned tuna, EU agreed to grant Viet Nam a satisfactory tariff quota. The EU granted Viet Nam a significant amount of quota for milled rice, unmilled rice and fragrant rice. Imported rice under this quota is completely exempted from tax. Particularly for broken rice, the import tariff will be removed according to the roadmap. For rice products, the EU will reduce import tariff down to 0% within 7 years. All of other products like vegetables, processed fruit and vegetables, fruit juices as well as handbags, suitcases, plastic products, glass ceramic products will basically be removed from tariffs once the Agreement takes effect. The EU also did the same with Vietnamese honey. Viet Nam committed to remove 65% of tariff lines for EU commodities once the Agreement takes effect. Within 10 years, Viet Nam will remove more than 99% of tariff lines. For the rest, Viet Nam will apply the tariff quota with the rate of 0%. Import tariffs for wine, beer, pork and chicken will be removed within 10 years. For export tariff, Viet Nam committed to mostly remove the export tariff under a fixed roadmap: only reserve export tariff for some important products, including crude oil and coal. The EU granted Viet Nam a commitment in trade, service and invest areas, which is better than in WTO and equivalent to highest rate in the recent EU's FTAs. In contrast, Viet Nam granted the EU a better commitment than in WTO and at least equivalent to the highest open rate that Viet Nam used for current FTA negotiating partners, including the TPP.

TPP is the deepest and most comprehensive commitment which commits to bring 95-100% of commodities into the roadmap of import tariff removal (long term); 70-95% of tariff lines will be removed once the agreement takes effect. The remaining will be removed under basic roadmap in 3-10 years, some sensitive goods will be removed in 11-15/16 years. *For agriculture, forestry and fishery*: Remove the import tariffs for agricultural and forestry products. *For SPS*: specify the key principles to facilitate further trade including: SPS measures applying only to the necessary and not discriminated levels, equivalent recognition, recognition of the non-disease regions, transparency, application of emergency measures allowed, facilitation on the inspection process, technical consultation and strengthening cooperation among the related stakeholders. Re-establish a fair part of agricultural trade in the TPP area through the commitment to remove agricultural export subsidies

in the region. *Rules of origin*: hold similar commitment level to the FTAs Viet Nam has signed, some products (sensitive products for manufacturing or common resources) have a higher level of commitment than the existing FTAs. Another greater opportunity is the trans-national investments together with advanced Science and Technology and labor skill improvement. It also creates favorable conditions to scale up production size and promotion of sector's restructuring process towards increased value addition and sustainable growth.

RCEP is a free trade agreement between the ten member states of ASEAN and the six states with which ASEAN has existing FTAs (Australia, China, India, Japan, South Korea and New Zealand). This agreement aims to establish the East Asia Free Trade Agreement (EAFTA) and the Comprehensive Economic Partnership in East Asia (CEPEA). RCEP is expected to bring new opportunities for Viet Nam through the improved access to the investment and export markets of ASEAN and its partners (both developed and developing countries) with demand for diversified products and services. At the same time, it is also expected to help the business sector to actively participate in the value chain and regional production region. TPP negotiation concluded between 12 member countries at the beginning of November 2015 has promoted the RCEP negotiation process led by China. 16 member countries agreed to waive tariffs for 65% of trade in goods - equivalent to 8,000-9,000 items, under the RCEP plans. Out of the 35% of total products not included in the initial agreement, RCEP members are expected to gradually cut tariffs to 0% within 10-year-roadmap after 2017 for 20% of items, while further talks are needed for the other 15% of remaining products, which are mostly sensitive items. The RCEP was launched in November 2012 with the aim of establishing deeper economic cooperation between the 10 ASEAN members and Australia, China, India, Japan, New Zealand and South Korea, with a focus on trade in goods, services and investment. If signed, the Agreement will create an economic bloc with a combined population of 3.5 billion and trade volume of \$10.7 billion, accounting for nearly 30% of the global trade.

5. Vegetable sector

5.1. Introduction

The global demand for vegetables is increasing. Global vegetable consumption, as defined by FAO, has increased from 190 million Mg in 1961 to 880 million Mg in 2009, because (1) the global population has increased from 3.1 billion in 1961 to 6.8 billion in 2009, and (2) the daily vegetable intake has increased from 170 g per capita per day in 1961 to 360 g per capita per day in 2009. The daily vegetable intake is increasing because of a growing awareness of the important positive effect of vegetables on health, and because of a demand for year-round availability and diversity of foods. Continuing urbanization and increasing welfare in the cities result in an increasing year-round demand for commercially produced vegetables.

Vegetable and fruit production plays an important role on the agriculture of many countries in the world. Vegetable and fruit sector is also an important production sector of Vietnamese agriculture. Viet Nam enjoys numerous favorable conditions for vegetable and fruit production in which climate and ground are suitable with tropic, subtropical vegetables and fruits and some temperate vegetables and fruits.

5.2. Production

In recent years, the vegetable production is increasing in term of quantity and in term of quality demand. As shown in Table, the major cause in production increase is due to an increase in the vegetable area harvested. Yield has not been improved a lot in recent years.

Table 12. Area harvested, yield and production of all kinds of vegetable in Viet Nam

Vegetables Primary + (Total)					
	2008	2009	2010	2011	2012
Area Harvested (Ha)	690,620.00	787,890.00	818,008.00	835,918.00	848,200.00
Production (tonnes)	7,724,502.00	9,064,085.00	8,975,534.00	9,014,988.00	9,439,000.00
Yield (Hg/Ha)	111,849.00	115,043.00	109,724.00	107,845.00	848,200.00

Source: FAOSTAT, 2013

In different regions of country, the growth rate of vegetable production was very divers depending on climate condition and the dynamic of local demand. The vegetable is cultivated mostly in Red River Delta and Mekong River Delta.

Table 13. Area harvested and yield of vegetables per region, 2007-09

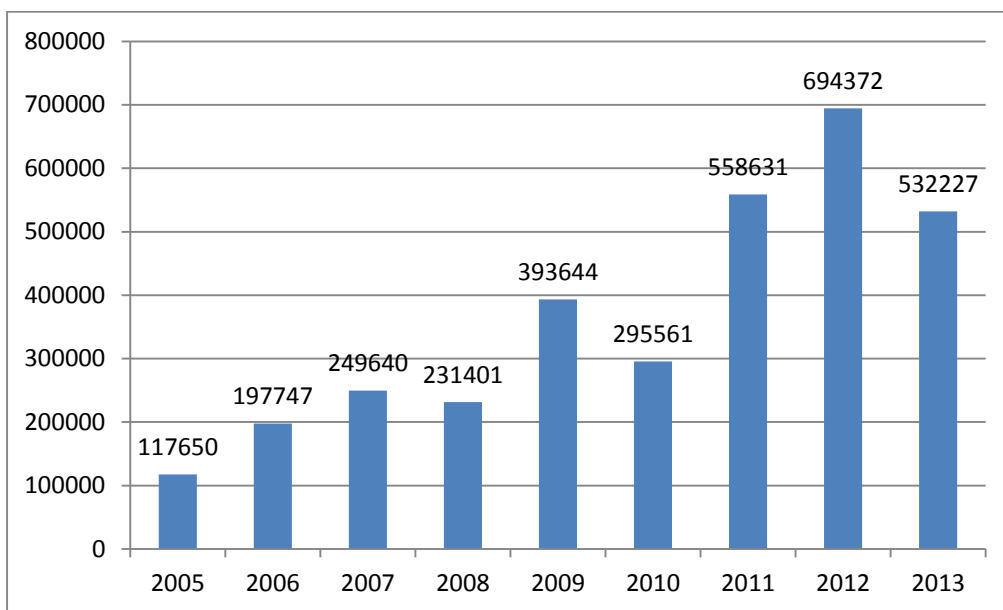
	2007		2008		2009	
	Area (ha)	Yield (tons)	Area (ha)	Yield (tons)	Area (ha)	Yield (tons)
Red River Delta	160 747	2 996 443	156 144	2 961 669	142 505	2 832 753
Northeast	82 543	947 143	85 948	1 018 904	89 359	1 084 037
Northwest	15 543	179 419	16 681	195 605	18 093	211 852
North Central Coast	76 982	766 829	80 761	826 152	80 620	828 024
Tot. North Area	335 835	4 889 834	339 534	5 002 330	330 578	4 956 667
South Central Coast	47 427	708 316	46 646	695 107	49 459	713 473
Central High Land	61 956	1 274 728	67 075	1 482 361	74 299	1 635 944
Eastern Mekong Delta	69 723	892 631	70 923	940 225	73 094	1 014 715
Mekong Delta	191 538	3 319 055	198 402	3 392 694	207 905	3 564 268
Tot. South Area	370 644	6 194 730	383 046	6 510 387	404 757	6 928 400
Tot. Nation	706 479	11 084 655	722 580	11 510 700	735 335	11 885 067

Source: MARD, 2010

5.3. Trade

The statistical data shows that the export of vegetable sector has increased for the last ten years. The increasing trend has been realized over recent years despite the negative impact of the global financial crisis and economic recession. In particular, a huge increase has been shown 2012, with a relative slow down of export in 2013. In 2014, data report a huge increase, mainly due to one product (HS 0709 – Vegetables nes, fresh or chilled). It is not clear if the 2014 value of this product is a typing error. However, it has been preferred to drop the outlier value and consider exports since 2013, in which data are more in line with the trend.

Figure 10. Viet Nam's exports value for edible vegetables and certain roots and tubers, 2005-13 (in USD)



Source: ITC calculations based on UN COMTRADE statistics

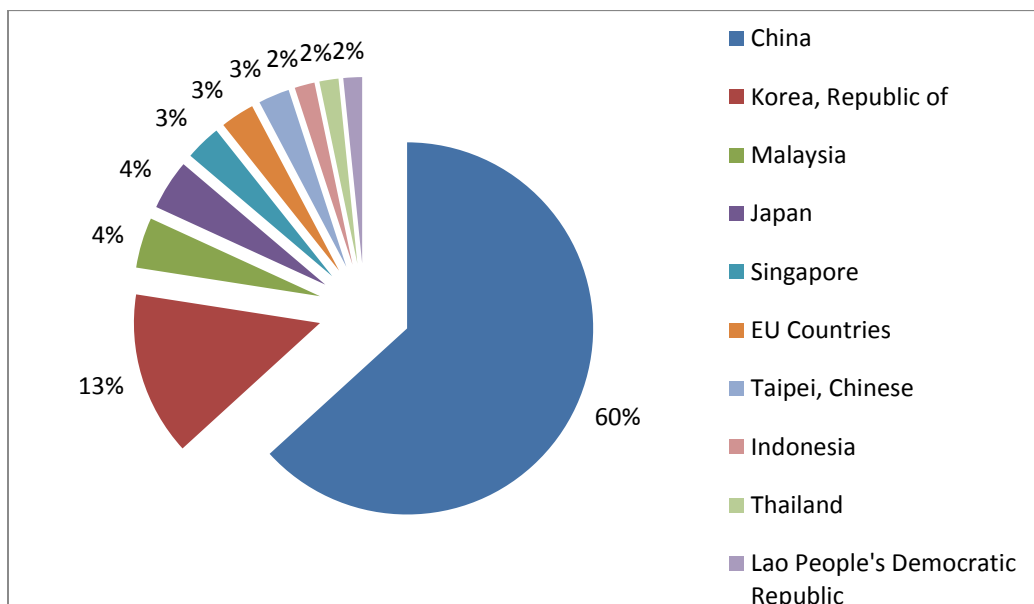
Table 14. Vegetables export value by country, 2013 (in USD)

Countries	Value (USD)
China	316252
Korea, Republic of	71201
Malaysia	21942
Japan	21791
Singapore	15531
EU Countries	14762
Taipei, Chinese	13563
Indonesia	8715
Thailand	8298
Lao People's Democratic Republic	8118
Philippines	6603
Cambodia	6332
United States of America	6035
Norway	3083
Canada	2842

Australia	2097
Switzerland	1207

Source: ITC calculations based on UN COMTRADE statistics

Figure 11. Top 10 importers of vegetables from Viet Nam, 2013



Source: ITC calculations based on UN COMTRADE statistics

5.3.1. Main export items

The export of fresh fruits and vegetables is reducing while that of processed fruits and vegetables is increasing. Fresh fruits and vegetables account for only 2.5% of the sector's export. Dragon fruit is the main export item of fresh fruits and vegetables. Main export items of fresh fruits and vegetable are as below (VIETRADE, 2009):

- Fresh fruit products: dragon fruit (pitaya), water melon, litchi, longan, mangoes, mangosteen, rambutan and banana;
- Fresh vegetables: onion, garlic, potatoes, cabbages, cucumber, taro, pumpkin, long bean

The main exports items of semi processed and finished products are:

- Drying/desiccated: coconut, mushroom, bamboo shoot, and litchi, long an, jack fruit, banana, taro
- Pickled /in brine: cucumber (gherkin), mushroom, baby corn;
- In syrup: pineapple, litchi, longan, mangoes;
- Fruit juices: pineapple, mangoes, Guava, litchi, yellow pumpkin, tomatoes;
- Frozen: spinach, pineapple, rambutan, litchi, and watermelon.

5.4. Vegetable supply chain

This section presents the current generic value chain of Viet Nam's vegetables and fruit sector: key players in the value chain, their roles, characteristics and the linkages among them are explained in the following (VIETRADE, 2009).

Growers

The horticulture sector in Viet Nam is dominated by relatively small-scale producers who grow and supply primarily for the domestic market. The export volume accounts for only small percentage in total output. With regard to vegetables, they

are often grown in house gardens or in concentrated horticultural areas, which have smaller sizes varying from a few hundred squared meters to 1 ha per household. In the campaign of developing farm economy, the individual growers are encouraged to join farming clubs, co-operatives, farming societies and associations. However, the number of growers joining these organizations is still limited. There are 2 big regions growing vegetables in Viet Nam, in which, Red River Delta counting for 26% and Mekong River Delta 25%. Fragmented and small-scale production base are making sourcing of consistent quality and maturity difficult. There are some more characteristics associated with the current growers in vegetables and fruits sector as follows:

- Although awareness of growers/farmers about quality and food safety in producing vegetables such as Spinach has increased, there is generally still lack of understanding of modern cultural practices that could lead to low productivity, low yields, high unit costs and serious latent disease problems in producing vegetables and fruits.
- Poor Post Harvest Practices that lead to bruising and skin blemishes and short shelf life.
- No dedicated cold storage facilities offering controlled atmosphere (C/A) storage, ethylene and CO₂ scrubbing.
- Few long-term contracts between the growers and collectors/exporters/processors, and less commitment from the growers in implementing product supply agreements. The mode of direct document agreement signed between the grower and the processor is in limit except a small part of raw pineapple, cucumber, tomatoes and high value vegetables supplied for processing exporters.

The above analyses suggest some changes for improvement in the future such as rationalizing the production base through encouragement of larger units or plantations; organizing growers into co-operatives that could develop into large co-operative export houses. This could help increase production yields, ensure consistent product quality, and contribute to rural/regional development.

Collectors/Intermediaries

The distribution chain in vegetables and fruits sector is involved with too many intermediaries playing a key role in collecting vegetables and fruits from the growers and then do packing and transportation to market, including selling to exporters/processors. Specifically, raw fruit and vegetables are purchased directly from growers to small private intermediaries who are often earn money by re-selling to other private intermediaries or/and processors or/and exporters or/and fruit, vegetables shops. Not only does this add to cost but it also causes too many breaks in the cool chain, excessive handling and deterioration in final product quality. This way may be acceptable for processing but excessive handling, breaks in the cool chain and the resulting deterioration in quality make such sourcing unsuitable for export marketing, especially for exporting fresh vegetables and fruits. Excessive handling through collection by intermediaries can cause inconsistent product quality and source of latent quality defects that may not be apparent until arrival at port of destination.

Processors/Exporters

The development of the sector has in the past focused on the supply of raw material to the many fruit and vegetable processing and freezing factories. Many of these factories are equipped with modern machinery and equipment, and most have adopted quality management certification (ISO 9001 and HACCP). The management of these factories are well conversed with the Quality Standards required by prospective importing countries particularly in minimal chemical residues (MRL's) and Good Agriculture Practice (GAP).

A major problem facing the processing factories is how to get the regular and consistent supply of raw material. This applies particularly to the factories situated in the city away from the production areas and who are reliant upon raw material sourced either directly from growers, intermediary agents/brokers, or the wholesale market. Contracts with growers appear unenforceable and growers regularly divert product to the wholesale market when prices are higher than the contracted price. Therefore, these factories appear reluctant to risk investment in farming or in providing seed and planting material for contracted farmers to secure supply of raw material.

The combined problems of sourcing raw material from a fragmented production base for processing and developing dedicated fresh produce export/packing organizations could be resolved by encouraging growers to form grower owned co-operatives that could develop into the role of specialized export houses. The co-operative could provide planting material, chemicals and fertilizer at lower cost because of their buying power, share machinery and offer technical assistance. Individual growers, as members, would each benefit from the activities of the co-operative and receive dividends from trading profit. The co-operative pack-house could provide the pre-cooling, packing and cold storage facilities and export market the packed products under a single brand.

Seed, Fertilizer, Pesticide and Packaging Suppliers

The essential inputs like fertilizer, seeds, planting and packaging materials are plenty and available in local market. Almost all of these materials originated from import, which can be purchased and sold freely in local market. Sometimes, shortage of packaging materials need to overcome by using imported sources. This has happened in several packaging factories and had contributed to higher production costs. The fresh vegetables and fruits exporting to China (border trade) are mainly packed by local package materials as bamboo basket, banana leaves, straw, etc., so it has undergone quite a loss.

Seeds are available in Viet Nam from various sources with different quality. However, Viet Nam is still struggling with development of high yielding crops and high quality seeds for vegetables and fruits sector. This issue needs to be improved in the future to help production of vegetables and fruits become more efficient. The sector also lacks indigenous fertilizer/chemicals causing high input production costs.

6. Case study: Vegetable in Son La and Dien Bien provinces for Hanoi market

6.1. Situation of commercial vegetable production in Son La and Dien Bien

6.1.1. Characteristic of participants in vegetable producer groups

Table 15. Characteristics of producers participating in group discussion

Indicators	Units	Moc Chau (n=20)	Thuan Chau (n=20)	Average Son La	Dien Bien	Total average
Age	Years	42.55	38.00	40.28	44.89	42.46
Family members	Person/household	4.00	5.50	4.75	4.33	4.55
Agricultural land	Hectare/household	0.92	0.75	0.83	0.49	0.67
Area of land for vegetable production	Hectare/household	0.28	0.05	0.17	0.17	0.17
Average income/month/household	1000 VND	12,050.0	2,430.0	7,240.0	5,344.4	6,342.11

Source: Survey results by FAVRI, 2013

According to the table, we see that average age of producers participating in group discussions in Son La and Dien Bien reached 42.58 years. Average area of agricultural land per household reached 0.66 hectares and average area of land for vegetable production per household reached 0.17 hectares (average area of land for vegetable production of households in Thuan Chau is the smallest, only 50m²). These are important resources in the process of developing commercial vegetable production in the study area. Through group discussions, we also see that households participating in commercial vegetable production in Moc Chau district, Son La province and Dien Bien district, Dien Bien province, are mainly Kinh ethnic while those in Thuan Chau district, Son La province are mainly Thai ethnic. The survey also showed that the group of vegetable producers in Moc Chau district has improved income levels of their family from 70-100% compared to the prior situation of underdeveloped vegetables production, while the group of vegetable producers (Thai ethnic) in Thuan Chau creates about 40% of the income of the household from vegetables. Rate of income from 30-50% of total income of the household is resulted by the groups discussion of vegetable producers in Dien Bien district.

6.1.2. Supply sources of seeds and inputs

Thus, supply sources of vegetable seeds for producers are varied. Each of these supply sources has advantages and disadvantages, they are:

- 1) Imported seeds: Types of vegetable seeds are very diverse, so producers will have many choices when purchasing vegetable seeds. However, the issues of controlling the term for using, using method and the quality of seeds are difficult for them.
- 2) Seeds purchased in the country:
 - They are distributed by companies in the country: Their types are not diverse, so producers have very little choice when purchasing them. In many case, they are not fully available to meet demands for vegetables about both quantity and quality to buyers.
 - Seedlings are produced and sold by some households: their types are not different, they are available without significant quantity, so they cannot be provided for producer groups with the scale of commodity production.

Most opinions of producer groups indicate that the price of seeds is high nowadays.

- Seeds self-produced: In conditions when there are many problems for supply sources of seeds in the market such as seed quality, quantity and varieties not to meet demands of producers, source of seeds self-produced plays an important role in vegetable cultivation. The types of vegetable seeds self-produced are mainly H'mong mustard,

chayote, loofah, gourd, cucumber, courgettes, pumpkin, kangkong, sauforus, beans, while there are some types of vegetable seeds not self-produced by households such as tomato, cabbage, kohlrabi, cauliflower. The types of vegetable seeds self-produced have some advantages because households can save more money to buy seeds, they are tolerant to extreme weather conditions (frost, cold, etc.). However, they also have some disadvantages such as their low yield, and the uneven quality of products.

Supply source of fertilizers, pesticides: Research results showed that types of fertilizers and pesticides used for vegetables are offered by stores, large agents located in the district center close to the production areas of commodity vegetables. Particularly for Moc Chau district, Son La province, in each commune, there are collection points and they also undertake the sales of inputs like seeds, fertilizers and pesticides, so it is easy to purchase inputs and poor households can apply forms of postpaid when purchasing.

Table 16. Types of vegetable seeds that they have purchased or self-produced

District	Purchasing	Self-producing
MocChau	French bean, cabbage, cauliflower, eggplant, cucumber, small mustard, celery cabbage, Chinese cabbage, tomato, kohlrabi, courgettes, lettuce, Chinese lettuce.	H'mong mustard, lettuce, Ceylon spinach, kangkong, sauforus, loofah, pumpkin, chayote.
ThuanChau	Cabbage, beet, kohlrabi, green mustard, Chinese cabbage, celery cabbage, potato, carrots, tomato, cucumber, cauliflower, pakchoy, Chinese lettuce.	Pumpkin, courgettes, peppers, H'mong mustard, lettuce, onion, garlic, kangkong, sauforus, French bean, tomato, amaranth, ceylon spinach, bitter melon.
Dien Bien	Celery cabbage, Chinese lettuce, green mustard, bitter melon, cauliflower, kohlrabi, Chinese cabbage, cabbage, cucumber, tomato, green peas.	Ceylon spinach, sauforus, jute, colza, loofah, yard longbean, onion, garlic, pumpkin.

Source: Survey results by FAVRI, 2013

6.1.3. Conditions for development of vegetable production

Table 17. Resources for commercial vegetable production development

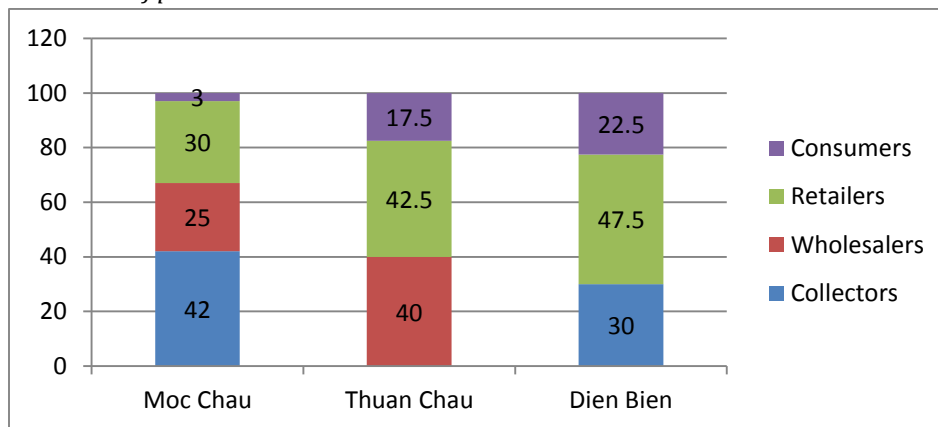
Resources	Thuan Chau district	Moc Chau district	Dien Bien district
Land	Soil for vegetable production in river areas of Muoi stream, mainly alluvial soils. Vegetables are grown on the area of cultivating paddy, they are conducted in winter.	Soil for vegetables production mainly alluvial soil. Vegetables are grown mainly on garden land.	Soil for vegetable production is mainly alluvial soil. Vegetables are grown mainly in winter, in the rice fields.
Water source	Water is supplied from Muoi stream, water quality ensured. Water shortages happen in months: March, April, May, June, July.	Water comes from streams, wells, pumping water from canals. Water shortages happen in months: March and April each year.	Water is supplied from Pe Luong lake, through system of canals; water quality is relatively good. Water shortages happen in months: February, March and April each year.
Transportation system	Field near asphalt, able to transport by trucks and motorbikes.	Field near motorways, convenient for transportation.	Field near the road, able to transport by trucks and motorbikes.
Labor	Both men and women	Both men and women	Both men and women
Capital	Lack of capital to buy seeds, pesticides for vegetables	Lack of capital for investment in the grid	Not have to conduct loans, enough capital for production.
Production experience	Conducting production according to experience.	Under direction of safe vegetables.	Producing following process of normal vegetables.

Source: Survey results by FAVRI, 2013

6.1.4. Vegetable distribution situation

For different producer groups, selling their products to agents also have significant differences. For example, producer groups in Moc Chau district sells products primarily to collectors, while producer groups in Thuan Chau and Dien Bien district mainly sell to retailers at markets in these districts. In all of discussion groups, the producer group in Tu Nhien village, Dong Sang commune, Moc Chau district has produced some vegetables for supermarkets and stores in the area of Hanoi. Leader of this group also collects products from some other groups within the scope of the Project. And there are transportation vehicles, so they are proactive in their delivery and each trip averaged 2 tons and maximum 5 trips per week. Producer group in An Thai village, Muong Sang commune, Moc Chau district has also some vegetable products to supply for retail stores in Hanoi but these are small volumes due to limited means of transport: transportation is made by passenger car with average only 250kg/time. Remaining producer groups mostly sell vegetables to collectors, wholesalers, retailers in the area of district.

Figure 12. Vegetable distribution of producers

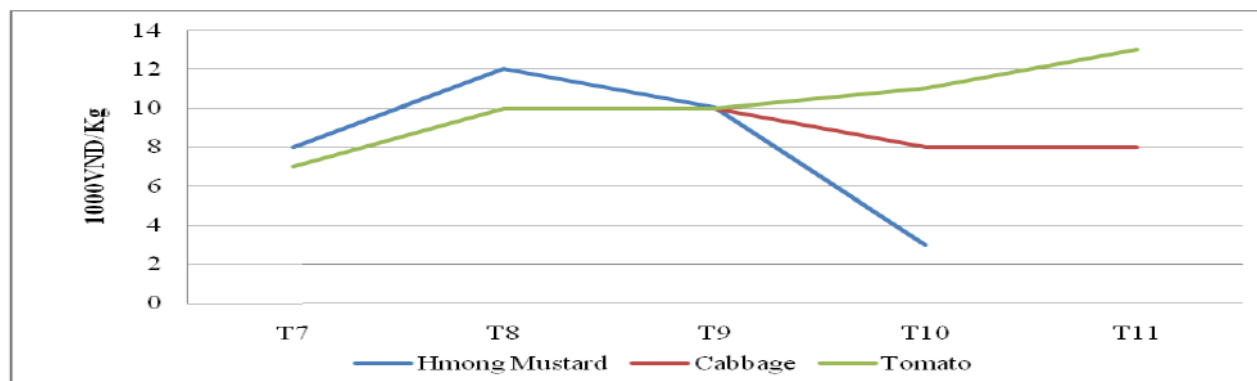


Source: Survey results by FAVRI, 2013

6.1.5. Fluctuation in the prices of some types of vegetables

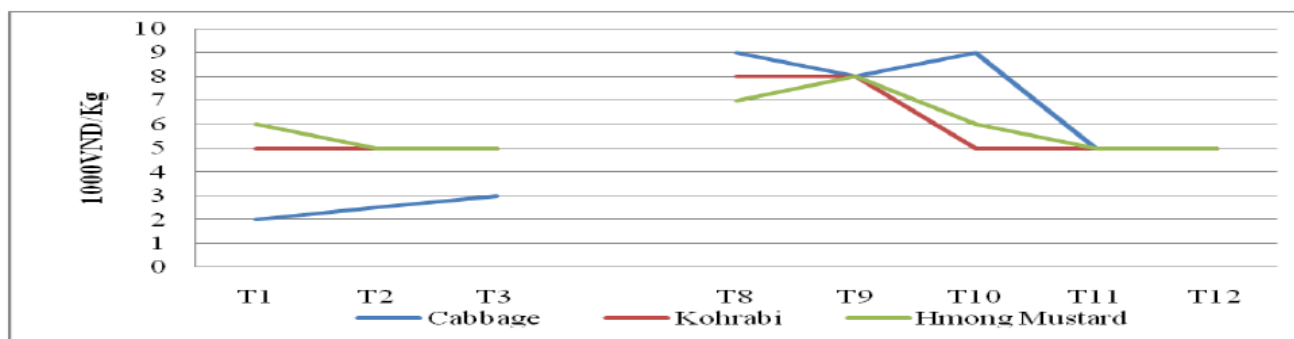
Discussion results showed that in the area of Moc Chau and Thuan Chau district, prices of vegetables decreased from October to December. Price of tomato in Moc Chau district tends to increasing from September to November due to quality of tomato improved, chosen by many consumers. According to producers, there are such quality tomatoes because they buy seeds with quality guaranteed, grafted seedlings. Besides, producer groups in Moc Chau district have established a new distribution channel to provide vegetable products for supermarkets and stores in Hanoi, so retail prices of tomato products tend to increasing in this period.

Figure 13. Fluctuation in the price of some types of vegetables in Moc Chau district, Son La province, 2013



Source: Survey results by FAVRI, 2013

Figure 14. Fluctuation in the price of some types of vegetables in Thuan Chau district, Son La province, 2013



Source: Survey results by FAVRI, 2013

Group of producers in Dien Bien: Price of some vegetable kinds strongly evolve and has downward trend in last months of the year because that is winter season of vegetable production at research area, vegetable volume to supply market demand is increasing.

Figure 15. Fluctuation in the price of some types of vegetables in Dien Bien district, Dien Bien province, 2013



Source: Survey results by FAVRI, 2013

From results of the group discussions, we see that there is a significant difference between the retail price of vegetables in Hanoi market and Son La, Dien Bien market. The levels of price also fluctuate very powerfully between months of the year. For example, in 2013, the price of tomato in Dien Bien market ranges from 3 to 15 thousand VND/kg, in Son La market, it ranges from 7 to 13 thousand VND/kg and in Hanoi market, it ranges from 19 - 25 thousand VND/kg. Thus, compared with the retail prices in Hanoi market, retail prices of vegetables in Son La and Dien Bien are significantly lower. This is an opportunity for producers in Son La and Dien Bien how to provide vegetables to the Hanoi market.

Table 18. Comparing the retail prices of some market vegetables in Hanoi market and Son La, Dien Bien markets, 2013

Market	Tomato	Cabbage	H'mong mustard	Courgettes	French bean	Lettuce	Taro
Hanoi	19-25	15-24	15-25	10-30	10-25	15-50	19-29
Son La	7-13	5-10	7-12	8-10	8-15	8-12	8-10
Dien Bien	5-15	5-12	7-10	8-10	8-10	6-12	7-10

Source: Survey results by FAVRI, 2013

6.1.6. Bottlenecks and difficulties for Moc Chau, Thuan Chau and Dien Bien producers

For Moc Chau producers

- **Product distribution:** This is the most difficult stage of vegetable producers. Households produce vegetables freedom, so they mainly sell vegetables to local collectors, they have not the organization of production and distribution as planned. Price of vegetables is not stable, there is great variation. There is the vegetable production model of off-season vegetables project, from that, groups were formed and they have succeeded in connecting to sell safe vegetable products to stores and supermarkets in Hanoi market. However, because they have small scales and have the supports of the project, they are initially assessed as successful due to the huge demands for off-season vegetables in Hanoi.
- **Seeds:** At the points of sales in villages, only a few types of seeds are often produced. When they want to purchase types of seeds with clear information, they often have to go to places very far from where they live, these points are concentrated at the center of Moc Chau district. Besides, to have good types of seeds for cultivating vegetables, they also have to purchase them with high price, but at these points, categories of seeds are not diverse. On the other hand, for these points of sales, seeds with small packages are not available to sell for producers that have small scales, they have to accept purchasing seeds with bigger packages, spend more money to purchase them, the remaining parts cannot be used for the next season due to poor germination.
- **Water source:** Happening water shortages in March, April and months in winter. In case of cultivating vegetables on uplands, the water source is mostly rainwater. In locations that producers can reserve water for production, their ponds/wells are too small, so the amount of water reserved is limited.
- **Pests and diseases:** The common pests and diseases are wilt disease on tomato, caterpillars, harmful green worms for leafy-vegetables, etc. They use pesticides once, these pests and diseases are not fell. Ability to detect and controlling solutions for pests and diseases are limited. The use of medicines and methods of pest control are difficult issues for them, especially biological medicines.
- **Cultivation techniques:** There are only some areas which have been involved in training courses, there are many places not yet to be equipped with technical knowledge about cultivating vegetables. In the localities that officials organizing training courses for producers, producers do not really attend, so the number of producers participating is very fewer.
- **Lack of capital:** In production, there are some households that want to build the mesh house for the purpose of limiting pests and the effects of weather to grow vegetables in all months of the year. However, they are also lack of capital to invest.

For Thuan Chau producers

- **Product distribution:** Vegetables produced are mainly distributed in the district. However, the price of vegetables is not stable, it is usually cheaper in main-season. For example, for cabbage, it is often sold at the price level ranging from VND 7,000-10,000 per kg in period from August to October, but it drops to VND 2,000-3,000 per kg in period from January to March. Some producers have to sell vegetables at the market that is away from production area about 3km, there is also the market distancing from production area about 60km (in case of producer group of commercial vegetables in Tong Lanh commune, Thuan Chau district, Son La province). Vehicles used to sell vegetables are mainly motorbikes, for each shipment, they can carry out from 60-80kg of vegetables.
- **Seeds:** For the producer groups in Thuan Chau district, they believe that it is very hard to access sources of vegetable seeds ensured about quality. They also cannot distinguish between good seeds and bad seeds. They often purchase vegetable seeds in Son La City, it is distant from the place where they live about 20km. High seed price is also difficult for them.
- **Water source:** Among 02 discussion groups, there is 01 group that is often lack of water from March to May each year. This also causes significant difficulties in the vegetable production for them.
- **Vegetable Cultivation Techniques:** Households participating in group discussions have not been trained techniques of growing and caring vegetables. They produce vegetables mainly based on their experience and learning together. So

they want to participate in training courses about techniques of cultivating, caring and harvesting, preserving vegetables;

- Pests and diseases: In production, there are some pests that they do not know-how to prevent. They are damaged by green worms for cabbage, kohlrabi, etc., in February and March.

For Dien Bien producers

- Product distribution: Vegetables are mainly sold at wholesale markets and sold to collectors in the field. Their price is not stable, so this is also one of the difficulties for producers there.
- Seeds: This is the place where producers can produce vegetable seeds, however, it happens the case of purchasing seeds with bad quality (this usually occurs for cauliflower, the major crop in winter). For many cases, in main-season of cultivating vegetables, because producers do not purchase seeds, they leave vacant lands and wait to purchase seeds (the longest time is 2 months – for cauliflower). This significantly affects the layout of crop season for vegetable production.
- Pests and diseases: In production, they face some pests and diseases that they do not have any method of prevention such as: cockchafer, harmful helix for types of mustard (April and July), wilt disease on tomato and insects for cauliflower, kohlrabi, ...
- Cultivation techniques: Among two discussion groups, the producer group in Thanh Xuong commune has trained on techniques of cultivating and caring vegetables from supports of the Department of Science and Technology in Dien Bien. However, the producer group in Thanh Xuong commune has not participated in any training course. So, they also hope that they will be trained on techniques of cultivating, caring and harvesting vegetables. In addition to the difficulties mentioned for each producer group in the districts.

For all producers

From research results, we also see that organizing production as well as conditions to serve for production and distribution by these groups have many constraints, they are shown as followings:

- The ability of marketing products: Most vegetables are produced to sell at close markets, so they are pre-processed, packaged and shipped very little. Households mainly grow types of vegetables that are easy for them in cultivation and caring. They also like to grow vegetables that have short time of growth (around 1 month) for the purpose of quick returns. They are not interested in produce types of vegetables according to market demand, method of distributing them to markets, recording sales, ... Therefore, the price as well as quantity of vegetables sold are very non-constant. Whereas for the marketing of vegetables to canteens of schools, State agencies, restaurants ... in this area, they do not know how to implement it;
- Production scale: Because groups, organizations or cooperatives producing vegetables have not been established, the development of vegetable production is also at the household scale. Vegetable categories are diverse but they have not significant quantity. So they are difficult to meet bulk orders regularly. Therefore, the expansion of production is done only when the interest groups have established for the purpose of planning and using the production together, and market research,...from that, they can promote the expansion of commercial vegetable production.
- Main transportation: except for vegetable producer group in Dong Sang commune, Moc Chau district, Son La province that has trucks to transport vegetables for the Fivimart supermarket, the remaining groups mainly use motorbikes to transport vegetables when selling, and when transporting vegetables very long-distance, they must send to passenger car.
- Techniques of harvesting, storing and packaging products: Like techniques of cultivating and caring for vegetables, most households participating in group discussions of commercial vegetable production do not know about the method of harvesting, preservation, packaging for vegetables to reduce post-harvest losses. This is one of the difficulties of producer groups, they need supports.

- Conditions of weather and climate: during the survey, we also found that the phenomena of frost, hail, low temperatures also had affected significantly their commercial vegetable production.

Table 19. SWOT analysis for vegetable producers in Son La and Dien Bien

Strengths (S)

- S1: Land area is suitable for vegetable planting;
- S2: Farmers are experienced in vegetable production;
- S3: Using seeds of some vegetable produced by their own households (H'mong cabbage, cucumbers, some kinds of beans...);
- S4: High income from vegetable production.

Weaknesses (W)

- W1: Use of local vegetable varieties that produce low productivity;
- W2: Limitation in planting technique of some vegetables such as: tomato, cauliflower, sweet chili, cabbage...;
- W3: Production is not followed market-oriented;
- W4: Manual labor;
- W5: Undiversified kinds of vegetable.
- W6: Weaknesses in skills to approach market.

Opportunities (O)

- O1: Potential to export vegetable product to Laos;
- O2: Vegetable field is near roads, therefore it is convenient for transportation with high volume;
- O3: Some areas would produce vegetable in all months of year;
- O4: Application of net-house production technique;
- O5: Increasing demand in Northwest vegetable;
- O6: A number of producer groups have supplied vegetable for Hanoi market.

Threats (T)

- T1: Limitation in vegetable seeds and fertilizer sources;
- T2: Water shortage for planting and cultivating vegetable;
- T3: Phenomenon of hoarfrost and hail affect planting and cultivating process;
- T4: Pest;
- T5: Low quality seeds.

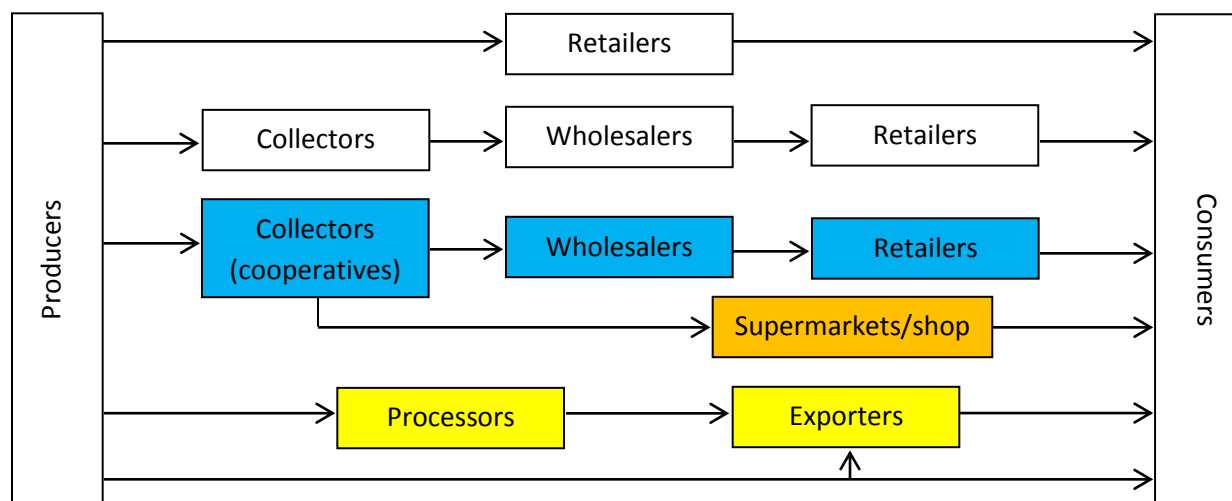
Source: Survey results by FAVRI, 2013

6.2. Vegetable business situation in Hanoi

6.2.1. Vegetable supply chain from Son La province to Hanoi

Subjects providing vegetables to retailers and street vendors in Hanoi are mostly producers and wholesalers, while retailers in Son La primarily take vegetables from producers or collectors. Research results showed that number of street vendors tend to increase. Usually, they are people who live in rural areas or in the neighboring provinces of Hanoi.

Figure 16. Son La province vegetable supply chain



Note: **White**: local supply chain in Son La; **Blue**: safe vegetable supply chain in Hanoi; **Yellow**: future trend in supply chain

Source: interview with FAVRI, 2016

Unlike retailers at markets and street vendors, objects who supply vegetables to supermarkets and stores in Hanoi are mainly farmer groups or cooperatives. These are agencies meeting the requirements of supermarkets and stores on the certification, quantity of deliveries and legal procedures. Among these suppliers, there are vegetable producer groups from Tu Nhien village, Dong Sang commune, Ta Niet village, Chieng Hac commune and An Thai village, Muong Sang commune. All of 3 communes belong to Moc Chau district, Son La, they often provide vegetables for stores and supermarkets in Hanoi. The vegetable categories provided are very rich (15 types) and large quantities focusing on some categories such as tomato, Hmong mustard, pakchoy, chayote, courgettes and beans.

Table 20. Seasonal distribution quantity of vegetables by sellers

	Hanoi		Son La	
	Supermarkets and stores (n=4)	Markets, street vendors (n=20)	Markets (n=5)	Average
Rainy season (May-October)				
Minimum quantity	375.00	47.75	70.00	96.70
Maximum quantity	762.50	74.25	104.00	174.30
Average	537.50	61.00	84.00	130.70
Dry season (November-April)				
Minimum quantity	662.50	51.25	70.00	138.80
Maximum quantity	1237.50	82.00	116.00	247.20
Average	912.50	65.50	90.00	186.60

Source: Survey results by FAVRI, 2013

Vegetable quantities distributed by retailers at markets and street vendors are relatively stable in months of the year while there is a considerable difference in sales of supermarkets and stores between seasons: average sales volume in dry season reaching 912.50kg/day, it is higher than in rainy season, only 537.5kg/day because some supermarkets and stores

were deficient for supply source of vegetables in rainy season. They only have sources of leaf- and fruit-vegetables produced in the Red River Delta, lack of temperate vegetables. They are not assured when purchasing these vegetables from suppliers around Hanoi. This is also an opportunity for increasing vegetable quantity distributed to supermarkets and stores by suppliers of the Northwest region to meet the needs of consumers in Hanoi.

Thus, in most of channels, centralized sales of main-season and off-season vegetables are not actually more. This is really a good chance for vegetable production areas in the North-west to develop production to be additional for shortages of this source and limited importing vegetables from China. In all of vegetables sold, there are some types assessed tend to increase in the recent 3 years:

Table 21. Some vegetables tending to increase sales in recent 3 years

Location	Hanoi	Son La
Supermarkets and stores	Tomato, cabbage, courgettes, green pepper, green mustard, colza, sauforus, beans, kangkong, Ceylon spinach, jute, lettuce, cauliflower, kohlrabi, carrot.	NA
Retailers at markets and street vendors	Tomato, courgettes, cauliflower, green mustard, beans, loofah, kangkong, sauforus, Ceylon spinach, jute, lettuce, chrysanthemum, cress, celery cabbage.	Courgettes, chayote, pumpkin, pakchoy, Chinese lettuce.

Source: Survey results by FAVRI, 2013

6.2.2. Transportation vehicles and method of packaging

Vehicles to transport vegetables from production areas to supermarkets and stores mainly are trucks while the ones to transport vegetables for retailers at markets and street vendors are mostly motorbikes.

Method of packaging and shipping

Most of retailers entry vegetables products from regions near places that they sell, so the transportation does not affect the form and quality of vegetables so much. In contrast, vegetables supplied to supermarkets and stores usually are shipped from distant production areas (Lam Dong, Son La, Lao Cai, etc.), so methods of packaging, the shipping time significantly influence to the quality of vegetables. Therefore, group of representatives for supermarkets and stores said that vegetables should be simply processed before packing, and, when shipping, suppliers should using appropriate packages for each category to limited crushing ratio.

Research results for chayote products shipped from Moc Chau district, Son La province (about 200km from Hanoi) providing for the Hanoi market showed that chayote products are usually packed in plastic bags by households with an average weight being 25kg/bag when shipping. This has affected the quality of chayote because plastic bags are not breathable, and they are easy to cause rotting or damaged/crushed for products.

Thus, to ensure the quality of vegetables during packaging and transportation, it is necessary to have supports and advices from research institutions for producers, transporters about methods of packaging, packaging materials, appropriate arrangements to limit crushed or damaged vegetables during shipping.

Method and time of harvesting

Among objects that are interviewed, there is 100% of opinions of representatives for supermarkets and stores, 50% of retailers in Hanoi and 60% of retailers in Son La.

Interviewees said that method and time of harvesting had affected the quality of vegetables. Therefore, they recommend that producers need to harvest vegetables in the morning or late afternoon. As for research team, we shared that

method of harvesting is also very important because it affects not only the quality of vegetables but also the quality of plants when they are harvested with many times.

6.2.3. Business process of vegetable products derived from the North-West region

100% of opinions from people in charge of business vegetables in supermarkets and stores said that they had sold vegetables from the North-west region such as Hmong mustard, cabbage, kohlrabi, tomato, celery cabbage, green peas, lettuce and taro;

25% of opinions from retailers at markets said that they had sold some vegetables such as chayote, Chinese lettuce, green peas originated from the North-west region.

Thus, vegetables sourced from the North-West region are mostly sold in some supermarkets and stores in Hanoi. However, types and quantity of vegetables sold are limited.

When asked about differences between the quality and price of vegetables produced from the north-west region and those of vegetables from other regions, there are 100% of opinions from people responsible for vegetable industry in supermarkets and stores said that vegetables from the North-west region have better quality and higher price compared to those from other regions, while only 60% of retailers at markets and street vendors in Hanoi said that the quality and price of vegetables from the North-west region are higher than those from other regions. This shows that vegetables produced from the North-west region have been provided to the Hanoi market and affirming their quality. This is an opportunity for sellers in increasing quantity of vegetables sourced from the North-west region to provide consumers in Hanoi as well as an opportunity to expand production for the North-West region.

Table 22. SWOT analysis for vegetable sellers

Strengths (S)

- S1: Experienced in vegetable selling;
- S2: Have number of regular customers;
- S3: Timely grasp tendency and customers' consumption habit;
- S4: Some sellers directly do business with final consumers therefore they understand market demand;
- S5: Understand quality of vegetable from different production areas. Some shops/stalls and supermarkets have sold products produced in North-west area;

Weakness (W)

- W1: Understanding of market retailers and street vendors about vegetable origin are limited;
- W2: Information related to regulations of vegetable safety and hygiene are modest;
- W3: Cannot thoroughly control vegetable quality that be sold daily;
- W4: Difficulty in vegetable transportation to selling point cause sellers are mainly women;
- W5: Difficulty in access to safe vegetable origin, especially market retailers and street vendors.

Opportunities (O)

- O1: Increasing consumption demand in vegetable;
- O2: Improvement in vegetable supply source;
- O3: Diversified kinds and origins of vegetables;
- O4: Hanoi city has supported in selling register condition for sellers.

Threats (T)

- T1: Consumers' trust in vegetable quality;
- T2: Limitation in kinds of safe vegetable to supply market demand;
- T3: Shortage of vegetable in cross-season;
- T4: Unstable price;
- T5: Increase in number of sellers;
- T6: Increase in transportation fee.

Source: Survey results by FAVRI, 2013

6.3. Results of vegetable consumer group discussions in Hanoi and Son La city

6.3.1. Vegetable consumption calendar

Through surveys of consumer groups in Hanoi and Son La, it was found that households use a variety of vegetables. They use types of vegetables that are available in the market. Specifically, we see that consumer groups in Hanoi city have used nearly 40 different vegetables, the ones in Son La city not only use vegetables as the plains but also use forest products and up to 47 types of indigenous vegetables. However, in the opinion of consumers, in all of 2 these research sites, they concern about the vegetable safety, so that they usually focus using more for some certain types of vegetables.

Figure 17. Vegetable consumption calendar of consumer groups in peri-urban area of Hanoi

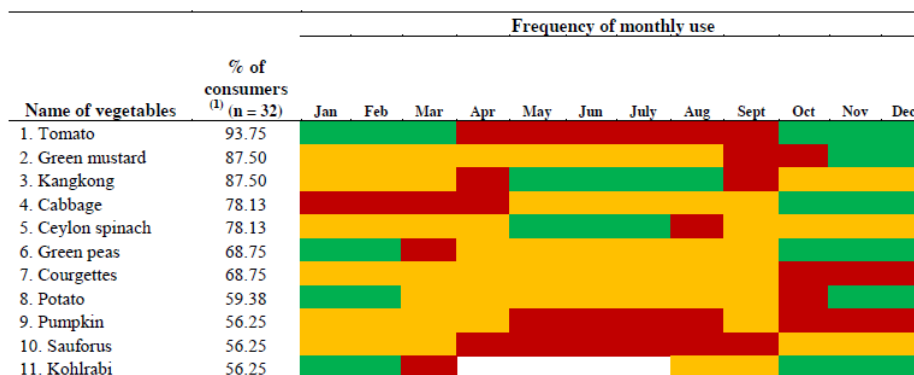


Figure 18. Vegetable consumption calendar of consumer groups in urban area of Hanoi

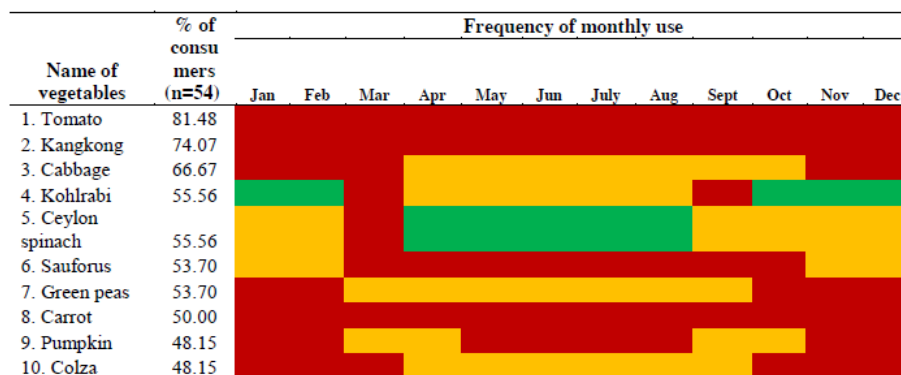
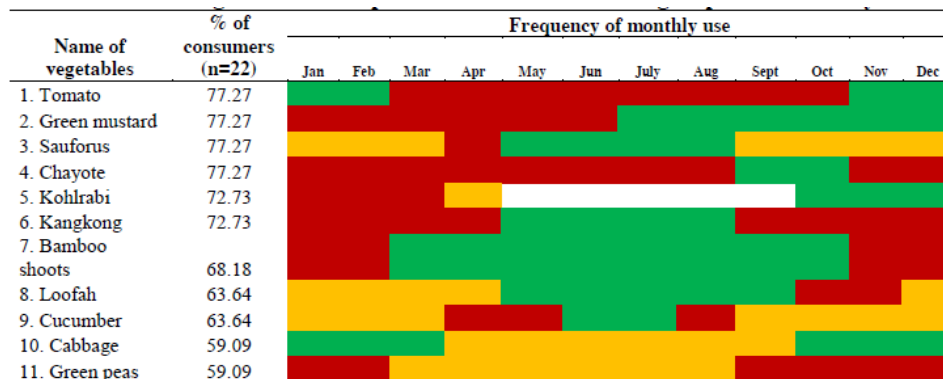


Figure 19. Vegetable consumption calendar of consumer groups in Son La

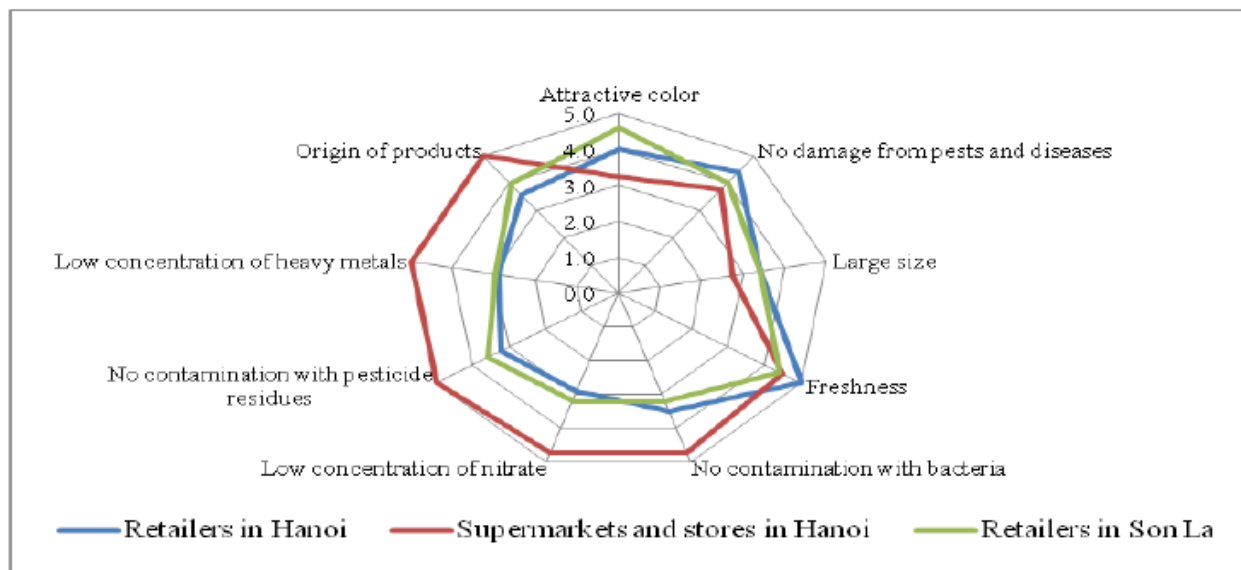


Note on the Figures: **Green:** use a large amount; **Red:** use a medium amount; **Yellow:** use little; **White:** do not use

6.3.2. Criteria for vegetable selection by consumers

From research results, we see that sellers' assessments of various sale channels on vegetable selection criteria of consumers are significantly different.

Figure 20. Criteria for vegetable selection by consumers



Source: Survey results by FAVRI, 2013

For example, consumers that purchasing in supermarkets have more concerns about issues such as origin of the products, the safety of vegetables (concentration of heavy metals, pesticide residues), while others purchasing vegetables from retailers at markets in Hanoi choose criteria of freshness, no damage from pests and diseases and attractive color for vegetables. In Son La, consumers concerned more about the freshness and no damage from pests and diseases for vegetables. Thus, the freshness, attractive color and other criteria related to product safety are important factors in vegetable selection of consumers. This suggests that the preservation, packaging and selling for vegetables that ensuring the quality are attended by sellers nowadays.

Table 23. SWOT analysis for vegetable consumers in Hanoi

Strengths (S)

- S1: Consumers' awareness towards role of vegetable are improving;
- S2: Volume of vegetable consumed has a tendency of increase in daily meal.

Weaknesses (W)

- W1: Consumers' understanding about effects of each specific type of vegetable is limited;
- W2: Consumer cannot recognize the products' origin;;
- W3: Consumers do not eat diversified vegetables due to the habit of using some traditional ones, the worry of vegetable products' safety;
- W4: Preference of buying vegetable nearby houses;
- W5: Consumers are mainly women and old people.

Opportunities (O)

- O1: Vegetable distribution channel is gradually diversified: market, supermarket, shop, mobile stall, home-delivery;
- O2: Vegetable is supplied from number of different areas;
- O3: Increasing demand in North-West vegetable;
- O4: Tendency of using domestic vegetable;
- O5: Consumers take lots interests in food safety issue.

Threats (T)

- T1: Consumers' trust in vegetable quality;
- T2: It is difficult to evaluate the differences in quality among vegetables from different areas and among normal vegetable and safe products;
- T3: Increasing price of indigenous vegetable.

Source: Survey results by FAVRI, 2013

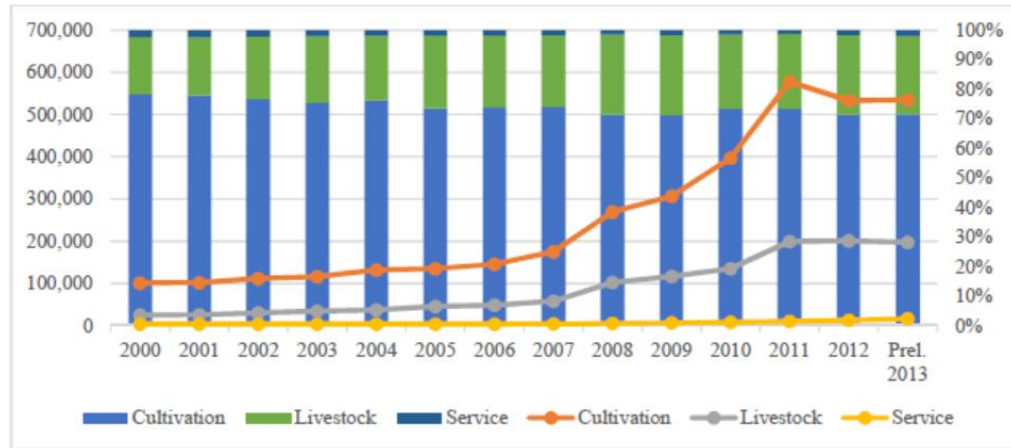
7. Pig sector

7.1. Production

The share of livestock in the output of Viet Nam agriculture increased continuously through the period of 2000 – 2011, recovering from two epidemic diseases in 2006 and 2010. However, within the last 3 years, the livestock output has reached a plateau at 200 thousand billion VND.

Regarding the structure of agriculture, the proportion of livestock sector witnessed a significant increase from about 20% in 2004 to the range of fluctuation of 25 – 27% in the next period, before reaching 26.3% in 2013 (VEPR, 2015).

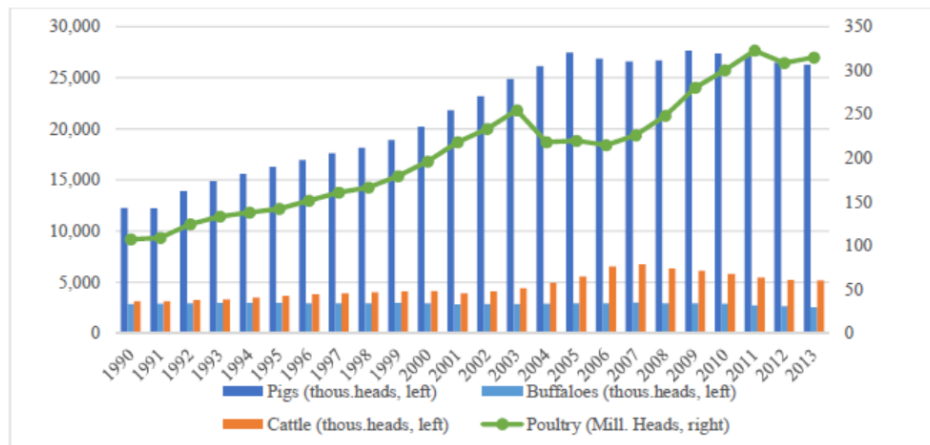
Figure 21. Gross output of Viet Nam's Agriculture, 2000-13 (billion VND)



Source: GSO, 2014

Consider the production of livestock sector only, most of livestock population experienced decrease, together with a stable trend in output of cattle output and a slight increase in the output of poultry and swine, which reflect the stagnation of this sector. The period 2008–2013 witnessed the fall in the population of swine by 1–3% to 26.3 million heads, of cattle by 1–5% to 7.7 million heads in 2013 and a fluctuation trend in the number of poultry around 300 million fowls with the overall increase of 5% per annual.

Figure 22. Viet Nam's Livestock population, 1990-2013



Source: GSO, 2014

7.1.1. Production systems and scale

There are four types of pig production in Viet Nam— smallholder or backyard with 1–10 pigs, small-medium with 5–20sows or 30–100 fattening, medium with 20–500 sows or 100–4000 fattening, and large with more than 500 sows or 4000 fattening pigs. In 2000, commercial farms were classified as production units that produce more than 100 pigs per year or generate products with a value of at least VND 40–50 million. From 2011, a commercial farm is one sells VND1 billion, equivalent to pig herd of more than 200 sold in a year.

Table 24. Pig production holdings in Viet Nam, classified by scale of production

Holding	Herd size	% of national herd (1999)	% of national herd (2006)	Breed
Smallholders or backyard	1-10 pigs	80	64	North: mostly local South: mostly cross with exotic
Small-medium	5-20 sows or 30-100 fattening	10	20	Cross and exotic
Medium	20-50 sows or 100-400 fattening	5	10	Exotic
Large	>500 sows or >4000 fattening	5	6	Exotic

Source: Kin and Hai (2008)

Farms with more than six pigs accounted for only 2% of the total of pig farms in 1994 (Tung et al., 2005). According to Viet Nam's Agricultural Censuses for 2001 and 2006, the percentage of pig-raising households with at least 21 pigs rose from 0.3% in 2001 to almost 2% in 2006. At present, small-scale production predominates. There are more than 4million pig-raising smallholders in the country, of which 52% are raising 1–2 pigs (GSO, 2011). Household pig production supplies at least 80% of Viet Nam's pork (Lapar et al. 2011).

Table 25. Scale of household pig holdings, 2011

Number of pigs	Share of pig-rearing households (%)
1-2	51.9
3-5	25.7
6-9	8.9
10-49	12.8
>50	0.8

Source: GSO, 2011

Many small mixed-production households that produced several different crops and raised pigs that consume by products or excess crop production have become large farrow-to-finish production units. There is significant growth in the number of commercial pig farms in all regions in the country. In 2011, the total number of commercial livestock farms were 6202, or 31% of the total commercial farms in the country, of which commercial pig farms were 23%.

Table 26. Types of commercial farms in Viet Nam, 2011

Type of farm	Farm products	Total units	Share of total (%)
Cultivation		8642	43.1
Livestock		6202	30.9
	Beef cattle	29	0.1
	Pigs	4676	23.3
	Chicken	1497	7.5
Forestry		51	0.3
Fishery		4433	22.1
	Fish	455	2.3
	Shrimp	3399	16.9
Mixed		737	3.7
Total		20065	100.0

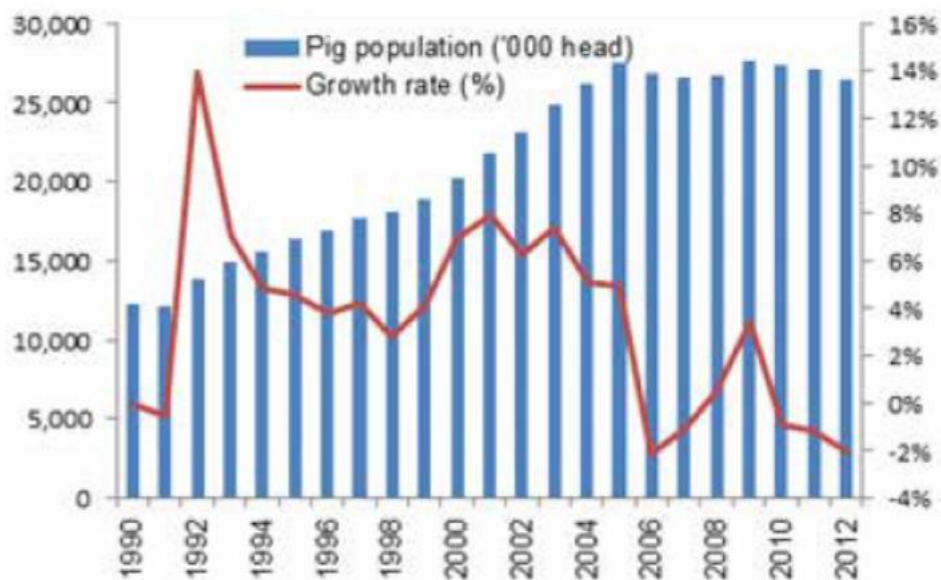
Source: GSO, 2011

7.1.2. Trends in pig production

Pig population numbers exhibited a persistent upward trend during 1990–2012, although at a slowly declining growth rate. In 2006, a Foot-and-Mouth Disease (FMD) outbreak reduced the total pig population, and Porcine Reproductive and Respiratory Syndrome (PRRS) occurred in 2008. The Department of Livestock Production in MARD has acknowledged that 2009–2010 was one of the toughest periods for livestock production in general and pig production in particular, due to widespread disease outbreaks, especially PRRS and FMD. Rising input costs (16% increase in electricity rate, 43% increase in the price of coal, 12–14% increase in feed prices, 20% increase in transportation costs, and 9% increase in interest rates) have also discouraged pig producers from expanding production. Problems in the marketing of pigs and pork, among other factors, might have caused a zero growth rate of pig production in 2010. The growth rate of meat production, including pig production, is slowing for several reasons. The number of farm households engaged in livestock production has decreased over the years because of unfavorable movement of relative input–output prices, urbanization that draws land and labor out of the agricultural sector, environmental problems, and especially disease outbreaks. As long as the growth rate of meat production is greater than growth in demand (which depends on population growth and growth in per capita meat consumption), meat imports will largely depend on price gap (between domestic and import prices) and quality (mainly based on demand for high quality meat).

The pig sector consistently contributed about 74–80% of total meat production in Viet Nam during 2000–2012, and pigs and poultry consistently make up about 90% of total meat production. The trends of their contributions are opposite, suggesting that these two products might be substitutes (Nga et al., 2014).

Figure 23. Pig population and annual growth rate, 1990-2012

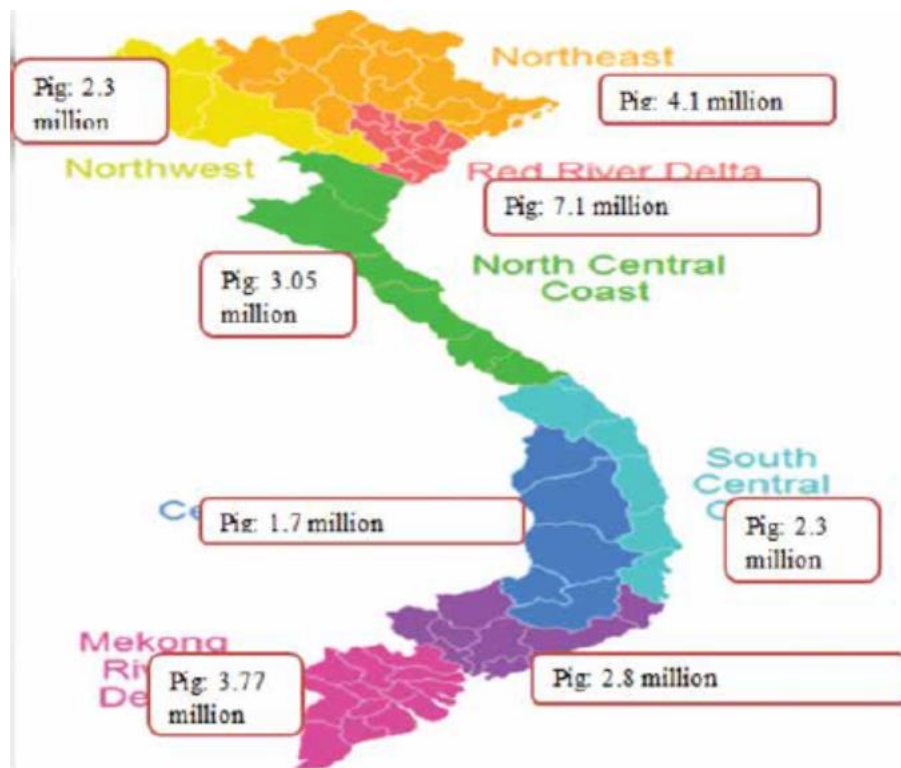


Source: GSO, 2013

7.1.3. Distribution of pig production in regions

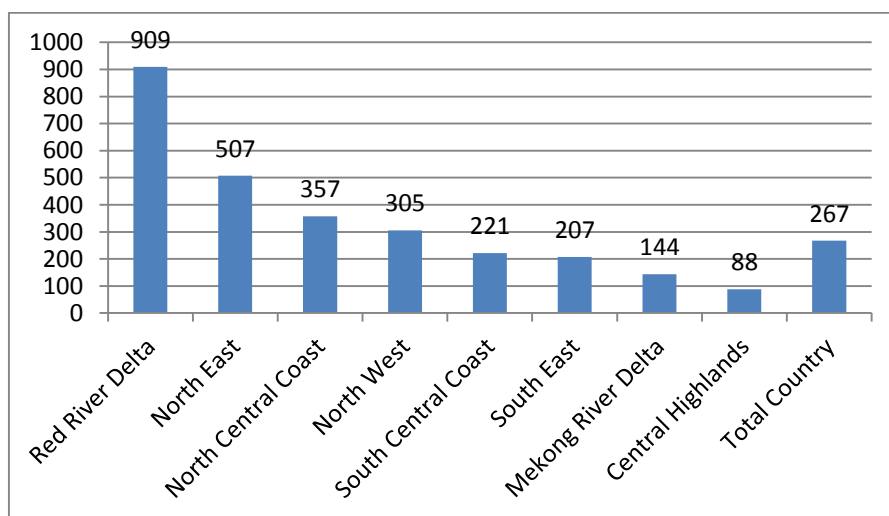
In 2011, the Red River Delta had the largest pig population in the country with about 7.1 million, and the Central Highland recorded the lowest number with 1.7 million. RRD had the highest pig density of 909 pigs/km² of agricultural land, followed by the North East and North Central Coast.

Figure 24. Pig population distribution in regions of Viet Nam



Source: GSO, 2013

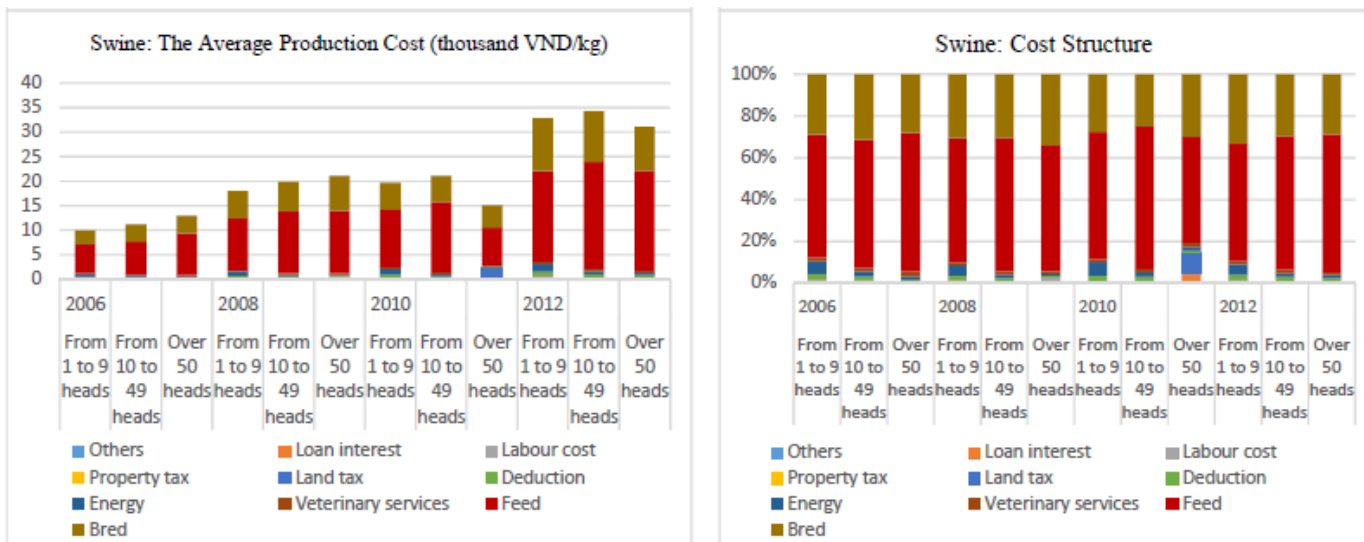
Figure 25. Pig population density in regions of Viet Nam (head/km² agricultural land)



Source: GSO, 2013

To clarify the competitiveness of livestock products, compared to the taste factor and shopping habits, production cost is considered as the standard can easily be quantified and used to evaluate. The total production cost of main livestock products in Viet Nam in comparison with some main trading partners remains high (Nguyen et al., 2014). Since production costs are still relatively high in meat products, except the pork carcass, the domestic livestock sector will face risk of intense competition from overseas after all tariffs lifted by the various Free Trade Agreements Viet Nam has signed over the last years. In the situation that small livestock farms currently account for nearly 90% in Viet Nam, farmers need to reduce production cost by increasing production scale. The livestock sector also needs to enhance vertical integration (from inputs to retail products) as well as horizontal integration (between the units in the chain) to help lower costs by reducing the intermediation expenses.

Figure 26. Average production cost per 1 kg of Swine and cost structure by farm size

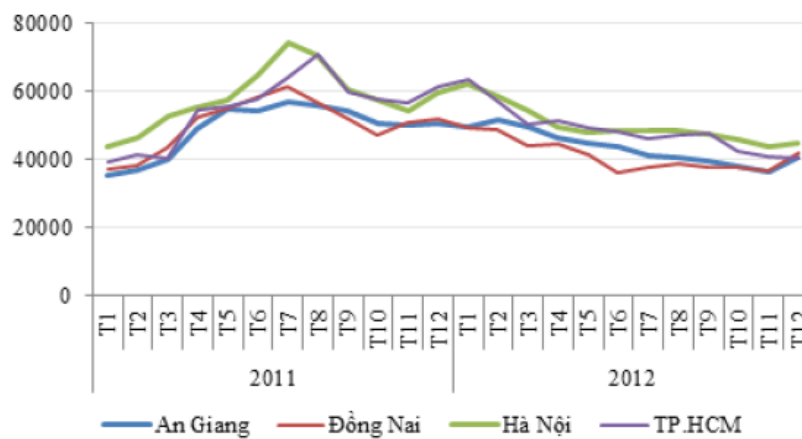


Source: SCAP, 2014

7.1.4. Domestic prices of pigs and pork

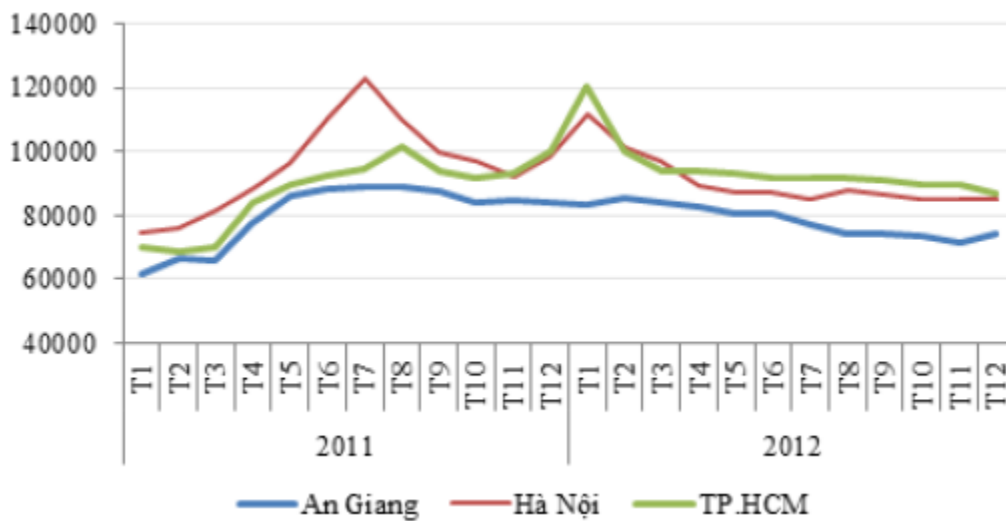
The year 2012 saw a downward trend in live pig and ham prices. In 2012, food prices were down but feed prices were still up due to a strong effect from world input prices, so causing a decrease in profitability for farmers.

Figure 27. Volatility in live pig prices, 2011-12 (VND/kg)



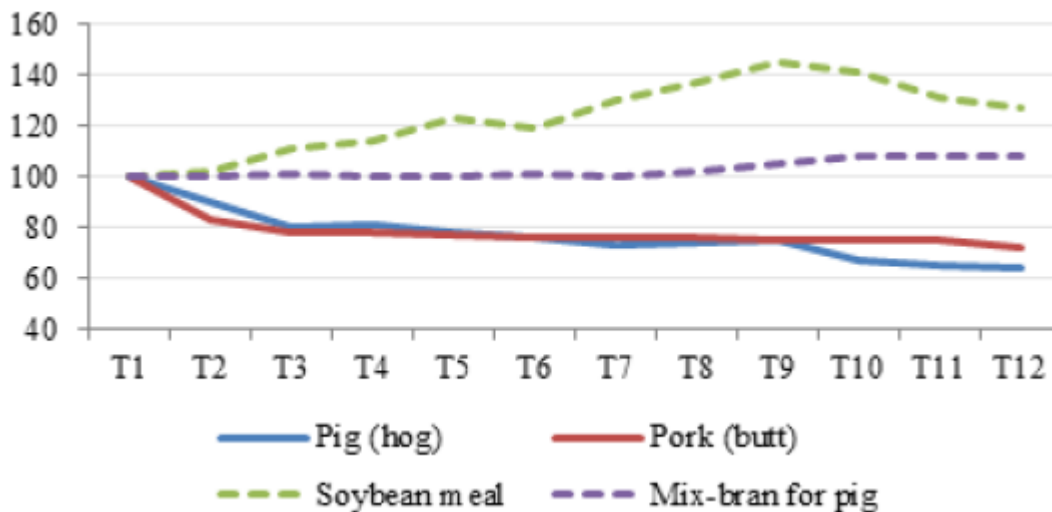
Source: AgroInfo, 2013

Figure 28. Ham price volatility, 2011-12 (VND/kg)



Source: AgroInfo, 2013

Figure 29. Changes in pork and feed prices, 2012 (baseline= Jan 2012, unit %)



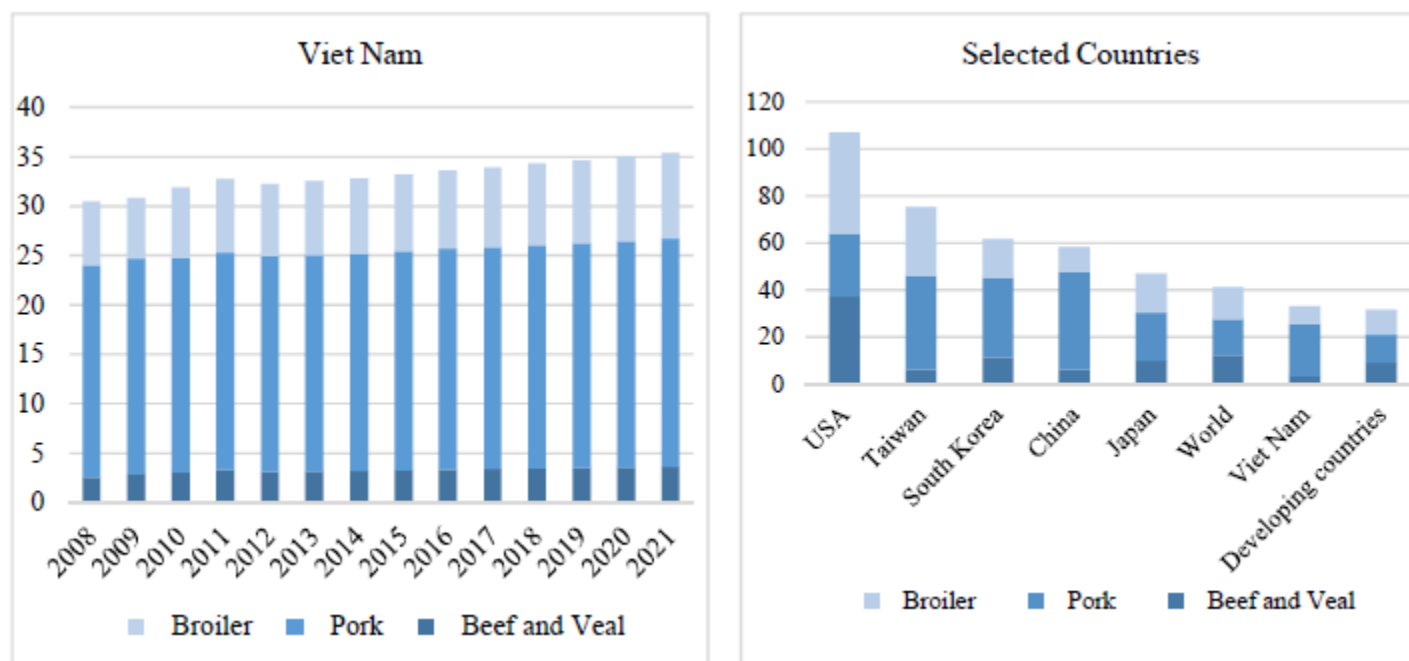
Source: AgroInfo, 2013

7.2. Consumption

According to the 2012 Outlook for the US and World agriculture of FAPRI, with the statistics until 2011 and the 2012 – 2021 forecast, the average amount of carcass consumed per capita of Viet Nam is 32.8 kg per annum in 2011 and is predicted to reach the point of 35.4 kg per capita per year in 2021.

Forecast for meat consumption per capita of Viet Nam in 2014 is 32.8 kg/person/year, including 22 kg of pork, 7.6 kg of chicken and 3.2 kg of beef. With the total population of Viet Nam in 2014 at 92.5 million, the total meat consumption of Viet Nam in 2014 is estimated at 3,034 thousand tons, of which 2,074 thousand tons of pork, 703 thousand tons of chicken and 296 thousand tons of beef (VEPR, 2015).

Figure 30. Per capita meat consumption of Viet Nam, 2008-21*, and selected countries, 2015 (kg/p.a.)



*: projection from 2012 to 2021

Source: FAPRI Outlook, 2012

During 2010, per capita consumption of pork was estimated at 13.7 kg. Using the same VHLSS data, pork consumption by an urban consumer during 2010 was about 14.8 kg/year compared to about 13.2 kg/year by a rural consumer. The same pattern is observed for chicken and other poultry meat and beef. Recent trends show that rural consumption is catching up with urban consumption of pork in terms of quantity per person, with urban pork consumption growth slowing relative to that of rural pork consumption over the last decade. If this trend continues, the meat consumption gap, including pork, between the two areas will likely narrow and possibly converge over time.

Table 27. Per capita consumption of pork in Viet Nam (kg), selected years

Region	2002	2004	2006	2008	2010	Average annual growth rate (2002-10) (%)
Country						4.5
Urban	13.5	15	16.4	14.4	14.8	1.2
Rural	9.1	10.7	12.1	10.2	13.2	5.6

Source: VHLSS, 2013

Pork consumption was highest in the North East at 18.3 kg/capita during 2010, followed by the Red River Delta and the North West. Per capita consumption of pork was lowest in the South Central Coast, at only 9.7 kg during 2010 and equivalent to about one-half of that in the North-West. Growth in pork consumption is highest in the North-West, North Central Coast, and the Central Highland, with per capita pork consumption during 2010 increasing by 50% compared to 2002 in these regions (Nga et al., 2014).

Table 28. Regional per capita consumption in Viet Nam, selected years

Region	Quantity (kg)			Comparison
	2002	2008	2010	2010/2002
Red River Delta	12.8	14.3	17.1	1.3
North East	13.1	13.2	18.3	1.4
North West	9.1	9.6	13.5	1.5
North Central Coast	8.3	9.0	12.6	1.5
South Central Coast	6.8	8.1	9.7	1.4
Central Highland	7.8	9.0	12.6	1.5
South East	10.5	12.9	12.2	1.2
Mekong River Delta	8.3	9.3	11.1	1.3

Source: VHLSS, 2013

Expenditures for pork and other meats Vietnamese consumers spend the largest share of their meat budget for pork, 34 and 38% in urban and rural areas, respectively. Consumers in both areas also rank pork as the most important meat in the meat basket. While beef and carabeef are 28% of total meat spending for urban consumption, this figure is very low in rural areas, at 7%.

Table 29. Percentage of household meat budget spent on different types of meat and seafood

Type of meat and seafood	Urban households		Rural households	
	%	Rank	%	Rank
Pork	34	1	38	1
Beef and carabeef	28	2	8	4
Poultry	20	3	27	3
Fish and seafood	18	4	27	2
Total	100		100	

Source: ILRI, 2010

Among food and drink expenditures by Vietnamese consumers, spending on Animal Source Food (ASF) is highest. During 2010, the monthly per capita expenditure for food and drink was estimated at VND 556000, of which spending on ASF was about one-third (VND 180 500) (GSO, 2012a). The share of food in total household expenditures was about 50% and accounted for at least 80% of total household expenditures for protein-source food. The proportion spent for meat is quite stable, 21–22% during 2002–2008.

Table 30. Per capita monthly spending for food and meat in Viet Nam, selected years

Spending category	2002	2004	2006	2008	2010
Per capita monthly food and drinks ('000 VND)	140.9	182.5	229.3	353.1	555.9
Food in total household expenditure (%)	52.0	48.6	47.6	47.1	49.7
ASF in total food and drink expenditure (%)	33.1	34.5	35.6	35.1	32.5
Meat in total food and drink (%)	20.2	20.5	22.0	21.6	21.2
Meat in total ASF (%)	61.2	59.5	61.7	61.6	65.4
Pork in total meat (%)	63.1	65.1	63.5	59.4	53.9
Pork in total food expenditure (%)	12.76	13.33	13.96	12.86	11.45

Source: VHLSS, 2013

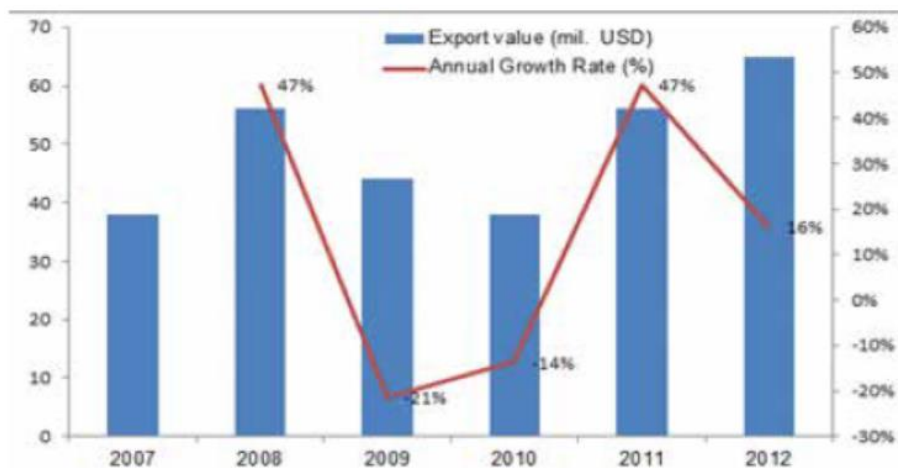
7.3. Trade in pigs and pig meat

7.3.1. Exports

Export of livestock products from Viet Nam is very limited. The export value of meat is quite low and has fluctuated over the years, from USD 59 million in 2008 to about USD 40 million in 2010. While other ASF exports recovered in 2010 after the economic crisis of 2008 and 2009, meat exports slowed in 2010. Generally, pork exports make an insignificant contribution to total exports from Viet Nam, with the share decreasing from 0.1% in 2007 to 0.06% in 2010.

Traditionally, Viet Nam had exported meat to a number of countries in Western Europe and Asia, but its export market has recently narrowed. Meat exports fluctuated widely during 2007–2012, largely due to disease outbreaks and higher production costs. In 2009 and 2010, export values dropped sharply as a result of a shortfall in the meat supply for the domestic market, and disease outbreaks that caused many farmers to quit production.

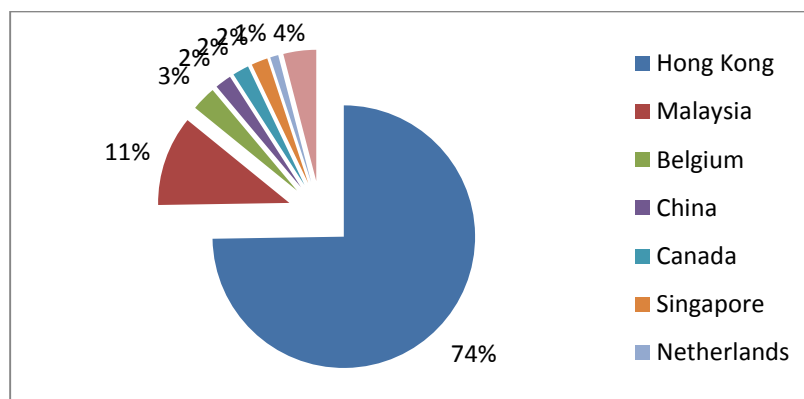
Figure 31. Trends in export of meat and edible offal from Viet Nam, 2007-2012



Source: Viet Nam General Custom Office, 2013

During 2007–2012, Hong Kong and Malaysia were the top importers of meat from Viet Nam, with a share in export value estimated to be 74 and 11%, respectively. Viet Nam exports mainly suckling pigs, and in the past it exported carcasses of pigs and suckling pigs (frozen) to Western countries. At present, most pork exports are live pigs to China (Nga et al., 2014).

Figure 32. Top importers of pigs and pork meat from Viet Nam, 2013

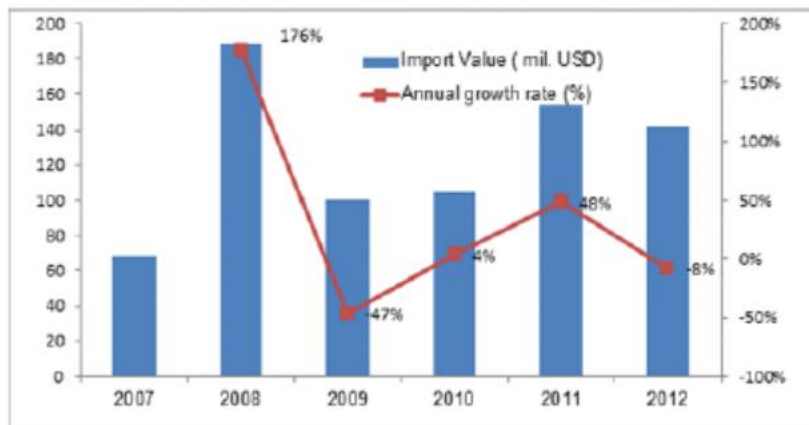


Source: ITC calculations based on UN COMTRADE statistics

7.3.2. Imports

Meat imports climbed to over USD 180 million in 2008 as a result of a severe shortfall in the domestic supply. Demand for imported meat declined in 2009 because of a recovery and a decision specifying maximum residue levels for meat products. In 2012, total value of meat imports was about USD 142 million, down about 8% compared to the previous year.

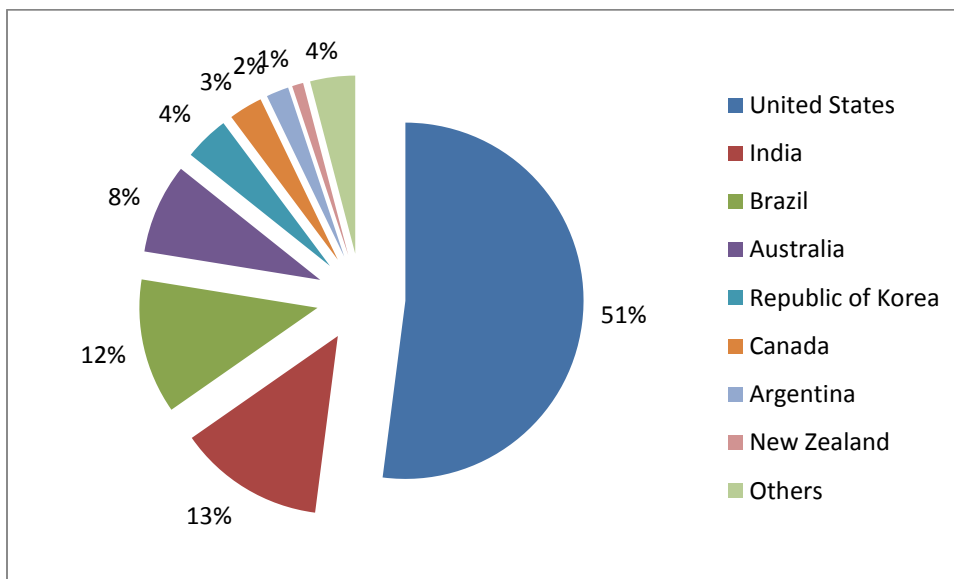
Figure 33. Meat imported by Viet Nam, 2007-2012



Source: Viet Nam General Custom, 2013

The U.S. is the leading meat exporter to Viet Nam, about 51% of total meat import value during 2007–2012. The U.S. and Canada are key suppliers of frozen pork. For frozen pig offal, Hong Kong, the U.S., Poland, Denmark, and Canada are the main suppliers. The U.S., Turkey, Hong Kong, and Brazil are the main exporters of chicken parts and offal to Viet Nam. Viet Nam imports beef mostly from the U.S. and Australia (fresh/chilled beef), and India (frozen beef) (Stanton and Sia, 2009).

Figure 34. Value of meat imported by Viet Nam, by exporters, 2007-12



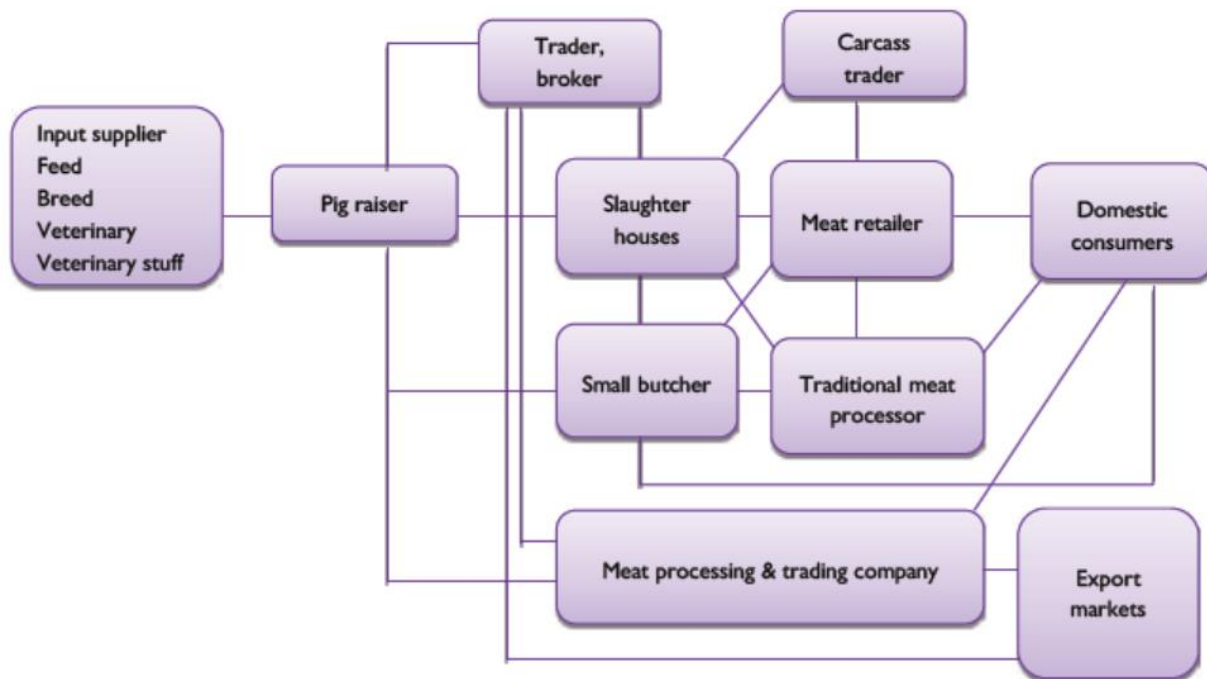
Source: ITC calculations based on UN COMTRADE statistics

7.4. Value addition, marketing, and value chain governance

7.4.1. Generic value chain in Viet Nam

The pig sector and value chain have changed and become more organized, but small scale and fragmentations are basic characteristics of pig production and marketing in Viet Nam. There are two predominant types of pork value chains (ILRI 2010). The first is typical of value chains in lowland areas, generally including both low land rural and urban and peri-urban areas. The other is typical of upland areas across the country. Pork supply chains in low land areas are generally longer and more complex and include a range of actors. Live pigs are traded, usually within and across provinces because of an insufficient supply at the province level in lowland areas. In contrast, pork supply chains in upland areas are generally shorter and simpler. Pig trade in upland areas is usually localized, with live pigs sold where they are produced.

Figure 35. A generic pork value chain in Viet Nam



Source: Nga et al., 2014

7.4.2. Post-farm nodes in the chain

Finished pigs go through several nodes in the pig value chain before reaching final consumers. Depending on the value chain gradient, the number of post-farm nodes in the chain varies, but in general, post-farm nodes include (Nga et al., 2014):

Trader/broker: Trader buys live pigs from farmers and sells to slaughterhouses or other traders. Brokers help traders search for live pigs for sale in their areas, and obtain commissions for providing this service.

Slaughter man: Slaughters pigs and also sells meat carcass, offal, and blood to meat wholesaler, meat retailer, processors, and/or consumers.

Meat wholesaler/carcass trader: Buys meat in bulk and sells to meat retailer. Institutional meat buyers may also buy from meat wholesalers.

Meat processor: Undertakes processing functions to transform pork into processed pork products. This is the node where processes add more value to pig meat.

Meat retailer: Sells meat to consumers (individual/institutional). Meat retailer can also sell processed meat.

7.4.3. Actors along the value chain

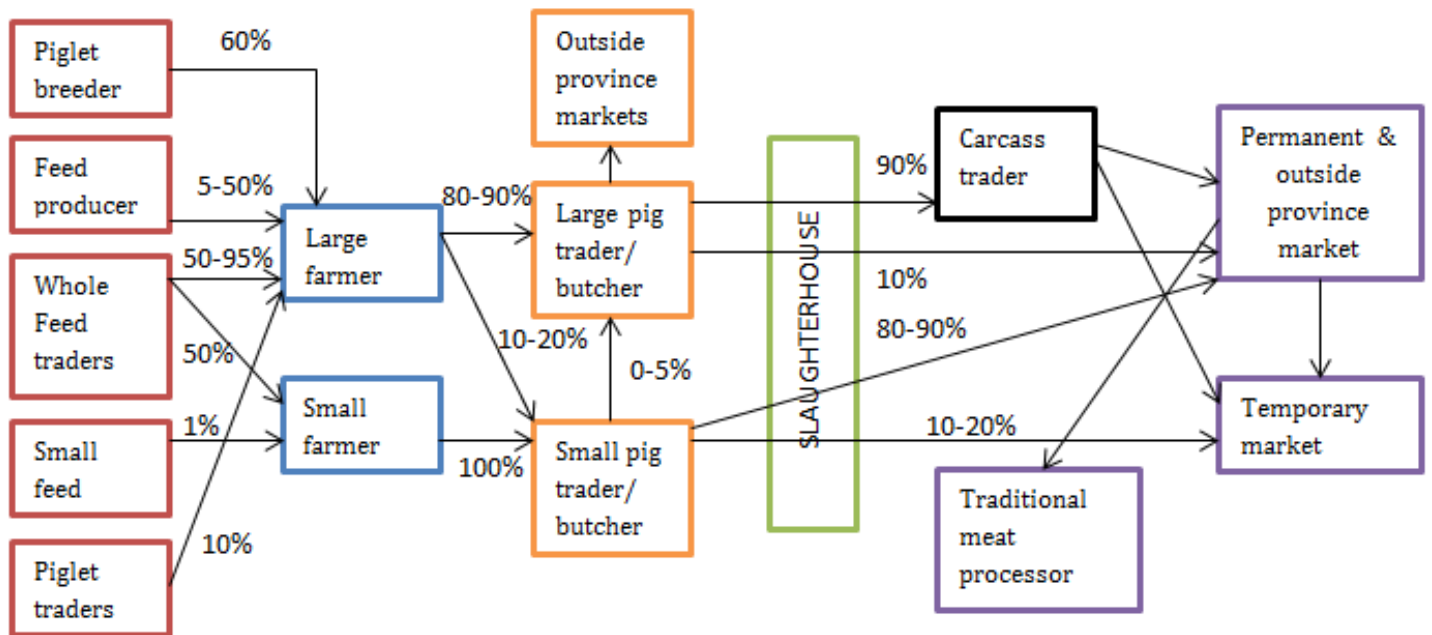
Input suppliers

Input suppliers for feed, breed, and veterinary inputs operate at different scales and distribution across regions, and depend heavily demand from pig growers.

Feed suppliers

Feed suppliers could be small private shops in villages/communes, feed agents, or feed producers selling directly to farmers. The feed shop is usually owned and run by both husband and wife. In regions where demand for compound/concentrate feed is low (either small-scale production or farmers can produce/procure feed on their own), there are typically few feed retail shops in the commune. Normally feed producers do not deal directly with pig producers, however, for a significantly large and regular volume as in the case for large commercial farmers, there is incentive for both to do so. Large pig farms and farmer groups usually purchase feed in bulk directly from feed producers or feed agent, significantly reducing the unit cost of feed. Large-scale pig farmers tend not to buy feed from small feed shops in villages/communes. For farmers contracted with feed and meat groups (such as C.P., DABACO), feed is provided directly from the contractors. In many places, feed is delivered to a farm by the feed shop owner. A feed supplier in communes may also raise pigs.

Figure 36. Typical pork supply chain in lowland areas of Viet Nam



Source: Nga et al., 2014

Breed suppliers

Breed suppliers may be piglet traders or piglet producers. A trader buys piglets from various sources (farmers, breeding stations) and sells to farmers. The traders may source piglets from different areas, with or without quality control,

and hence may be a source of diseases. In most cases, a piglet trader is male, probably due to the characteristics of the job that demand good health and time to be able to source, collect, and sell piglets in many places. Some large farms contract with feed and meat groups, such as C.P. group, and also sell piglets to farmers when there is an excess supply but at a higher price than the prevailing market because piglets from these farms are better quality. More farmers tend to raise sows and produce piglets on their farms because they perceive that their own piglets are healthier than those bought from traders (RIA, 2013). After disease outbreaks, piglets are challenging to find and expensive. The number of piglet traders and their scale of operation has seemingly declined over time as farmers respond to disease outbreaks and epidemics.

Veterinary inputs suppliers

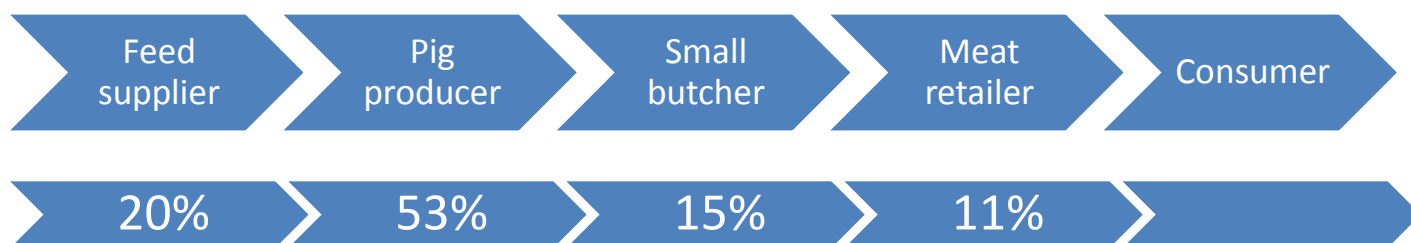
Suppliers of veterinary products range from small shops in a commune/village to bigger shops in town/city, and trading/producing companies. This service must have permission from the government to operate. Normally the number of veterinary shops is less than the number of feed shops in a commune. In some communes where pig density is low and small-scale production is dominant, there are no veterinary facilities and farmers have to go to the nearby communes/towns to obtain their veterinary supplies. In some cases, feed retailers in the commune also sell veterinary supplies. Another supplier is para-vets in the commune/village. They treat livestock on farms as well. Small scale farmers usually buy veterinary inputs in shops, but large farms are more connected with big traders or veterinary manufacturing companies. For contracted farmers, the contractors might provide veterinary inputs directly.

Pig raiser

Pig farmers produce finished pigs, piglets, and in some rare cases, suckling pigs. The scale of pig production strongly shapes its relationships with other actors in the chain. Small-scale farmers have quite a loose relationship with upstream and downstream actors due to their low demand for inputs as well as low sale volume. For example, many smallholders produce piglets themselves and use less manufactured feed, especially in the central and mountainous areas (RIA, 2013). They also believe that pigs fed with feed they produce are healthier and less susceptible to diseases than those fed with manufactured feed. Smallholder pig farmers are usually women, while on large farms, men are more engaged in production functions, especially treating sick animals, artificial insemination, and making decisions about their livestock business.

Along the typical pig value chain, farmers generate the highest share of value added, accounting for 53% total value added in the entire value chain, followed by feed suppliers at 20%, meat retailers at 11%, and small butchers at 15%. Note that it takes 4–5 months for a farmer to produce a finished pig, while other actors have more frequent, or even daily, transactions.

Figure 37. Share of value added by actors in the pig value chain in Viet Nam



Source: Lapar et al., 2011

Another study by Huong et al. (2009) found that farmers generate the highest value added in the indigenous pig value chain. The indigenous pig (I and Mong Cai) value chain in upland areas includes farmers, collectors, traders/ slaughterers, and retailers. A different feature of indigenous pig production in upland areas is that the major source of animal feed is home production. In this chain, the farmer creates about 59% of total value added, followed by the trader at 21%, meat retailer at 16%, and a collector at 4%.

Pig traders and brokers

A pig trader buys live pigs from farmers and sells them to other actors such as slaughter men, small butchers, meat processing and trading companies, or other pig traders. Pig traders normally operate across provinces and regions, especially if trading volume is significantly large. The main function of this trader is to move live pigs among regions from surplus areas to deficit areas. Where there is excess demand in the final destination, price gaps between producing regions and demand regions can generate profits. For example, pig traders collect pigs from rural areas (e.g. Central region) and transport them to urban areas (Hanoi), or sell to China. There are no data available on live pigs exported to China, but according to DLP (2011), there were two cases during 2006–2011 when export of live pigs to China was significant. Export volume could reach 300–350 t live weight per day during November 2007–February 2008, and export volume could reach 500–600 t of live weight per day during November 2010–January 2011. Recently, Thang and Pham (2013) reported that China traders collected fat pigs in Viet Nam (heavier than 100 kg) in July–August 2013, and exported volume could reach 200 tons/day. DLP also emphasized that live pig exports across the border with China was not a regular occurrence and was influenced by the price gap between the two countries. During time of excess demand and reasonable price gap among regions or demand from China, pig trading is quite intensive, and viceversa. However, traders may be perceived as a source of risk for disease outbreaks when moving sick pigs between places. Almost 100% of pig traders are male, probably due to job characteristics.

For indigenous pigs, traders normally handle a small volume (1–3 pigs per day) while Mong Cai traders mostly trade 4–8 per day (Huong et al. 2009). Indigenous pig traders may operate quite far away from production areas to big cities where there may be high demand for indigenous pork. The number of pig traders has grown in line with rising pork demand (Lapar et al. 2011).

In Northern Viet Nam, probably the area with the most pig traders is An Noi wholesale pig market (Binh Luc district, Ha Nam province), where pigs collected from various places are shipped to many provinces in Viet Nam and China.

Pig brokers are those actors that connect pig raisers with pig traders/slaughterhouses/other meat dealers. They do not keep live pigs but earn a commission for their service. For example, in Hung Yen province, a pig broker earns VND 20,000/pig (about USD 1) for every successful sale (RIA, 2013). Pig brokers mostly operate in pig production areas with a surplus where traders/slaughter men are not local people and normally collect pigs from several farmers to fill one shipping quota. All brokers are male.

Slaughter men and butchers

Slaughter houses operate at different scales in Viet Nam. Large ones are more likely located near big cities. There is one large-scale pig abattoir in Hai Phong, which was designed in the 1980s for export purposes, especially for suckling pigs to Hong Kong (FAO, 2008). The second abattoir with continuous-line slaughter of cattle and pigs is the VISSAN abattoir in Ho Chi Minh City, built in 1974 by the German Government. Large abattoirs often supply meat for modern retail markets (supermarkets) as fresh/chilled and processed for export, rather than for the wet market. There were 29,281 slaughterhouses in 2011, of which about 50% were for pig.

Except large-scale pig abattoirs that are attached to processing, dealing, and exporting meat and carcasses, other large slaughterhouses buy live pigs from farmers/traders and slaughter daily. They could either (i) have labor doing the work and sell directly to other meat wholesalers, retailers, or processors; or (ii) have other butchers come, buy pigs from the slaughterhouse's stock, kill the animals, and sell meat/carcass either wholesale or retail, or both. Normally, it is difficult to trace the origin of pork in such large slaughterhouses because pigs are imported from many traders. Hence, meat quality is normally unknown.

In rural/semi-urban areas where demand for meat is lower and scattered, local butchers both kill animals and sell meat/carcass for retail or wholesale. A butcher can also sell meat to local traditional processors.

Meat processing and trading companies

Vietnamese consumers prefer fresh meat over processed products, so the share of meat for processing is quite low. There are about 28 pork processing factories in Viet Nam with products such as ham and sausage (Thanh, 2011). Tung et al. (2010) also noted that processed meat accounts for less than 6% of meat sold, especially in rural areas. This figure is highest in Hanoi and Ho Chi Minh City, at just over 10%. Some trading companies process and export meat. The key players in the meat processing industry include some of the largest multinational and joint-stock companies such as VISSAN, which is the largest company engaged in food processing in Viet Nam. The major processed pork products include pâté, ham, and meat loaf type products. The operation of modern market outlets such as BigC and Metro Cash and Carry has encouraged development of modern meat processing. Normally, these big companies have contracts with large pig farms.

Traditional small meat processors

Apart from a concentrated modern meat-processing industry, local traditional processing units have existed over the years in Viet Nam, and there are traditional villages that produce different traditional products such as grilled chopped pork, fermented pork, and Vietnamese meat loaf. In Northern Viet Nam, there are several meat processing villages where many small meat processors operate, such as Uoc Le, Chem, and Dong Huong. Processed meat for urban/semi-urban consumers mostly comes from meat processing areas where many meat processors operate, such as in villages.

In rural areas where demand for processed pork is relatively low, normally there are few or no meat processors in a commune. The scale of operation for these processors is very small, about 3–4 kg of meat processed each day. Many of them do slaughtering, processing, and retailing, e.g. husband slaughters pig, wife does retailing, and both process the meat. For communes near traditional meat processing villages, there may be no meat processors because consumers might buy directly from the villages or through meat retailers at communes.

Meat retailer

Meat is sold to consumers through various channels, including modern outlets (supermarket, trading centre, food stores), wet markets in communes/towns, temporary meat vendors in villages, or itinerant meat vendors hawking from home to home. In 2011, there were 8550 (open/wet) markets in the country, 638 supermarkets, and 116 trading centers. However, a majority of Vietnamese consumers do not like to buy pork from supermarkets, and prefer to buy fresh pork from traditional market outlets (Lapar et al., 2009), so most meat is available in traditional open/wet markets. In 2011, there was one open market for about every 39km² in the country. The density is highest in RRD (11.8 km²), followed by MRD (22.8 km²). In rural areas, only 58% of communes have markets. The operation of small meat vendors is popular in rural Viet Nam.

Almost all meat retailers are female and operate at a range of scale, depending on demand and supply capacity in the marketplace. They might specialize in fresh meat, processed/cooked meat, or combine with other foods such as eggs, tofu, and vegetables. Normally meat retailers who register in markets specialize in only meat, partly because it is regulated by the market management board. Meat retailers in villages or temporary market places normally sell meat plus several other types of foods. The former might sell up to several pig carcasses per day in urban/semi-urban areas, while the latter trades a much smaller quantity, as low as 5 kg/day (RIA, 2013). Many meat retailers in village or temporary markets in rural areas have multiple functions such as slaughtering and processing (traditional meat loaf and grilled chopped pork).

Consumers

Customers who buy meat from wholesaler/retailers are either institutional buyers (restaurants, food shops, schools, hospitals, kitchen of enterprises/government offices), or households. Given the increasing trend for consumers to eat out, as well as enterprises that provide meals (often lunch) for workers, demand for meat by institutional buyers might increase. High quality meat is demanded by high-end restaurants, and in many cases, it is imported (for example, beef from the EU and New Zealand). There is no study on institutional meat buyers. However, recent cases of food poisoning related to institutional buyers have raised much concern about food safety in Viet Nam. Almost all individuals who buy are female, who also prepare food for their families.

8. Conclusion

Vegetable demand of consumers in Viet Nam has sharply increased over the last years, and in particular markets in Hanoi have shown a great interest in North-West vegetable products. Consumers show an increasingly concern about safety vegetables. The supply of vegetables are becoming more diverse, from the usual street vendors to the newly supermarkets, which increases the importance of distribution, packaging, and marketing aspects of the products. From the survey (FAVRI, 2013), we notice that there are some areas which are benefitting more from development projects (e.g. Moc Chau district in Son La province) and which are developing a “modern” supply chain of safe vegetables. These pilot projects should be expanded to other areas, so the entire rural population can benefit from a more coordinated supply chain and consumers can benefit from safer products on the market.

In order to do that, government should establish interest groups in which participants can exchange experiences and discuss how to improve technical and post harvest practices, and the organization of the entire supply chain, thanks to the dissemination of best practices and international expertise. Government should also invest in promoting modern facilities (e.g. laboratories, cold transportation/warehouses) for testing and labeling products, since the trend in consumers’ choices shows an increasing awareness about food safety issues. This is also important from an export perspective, due to TBT and SPS agreements that Viet Nam has to comply with to expand its export and to fully benefit from the several FTAs government has signed over the last years.

According to the analysis, there is a need of coordination among producers, and this problem could be solved by a greater participation in farmers’ associations. These associations should and could play a more important role in the supply chain, being the contact point between producers and retailers. This could also enhance a better understanding of marketing issues and a better coordination “from farm to fork”. In doing so, associations should raise the importance of contract farming, that it has been used over the last years but it has shown lack of reliability and lack of enforcing measures. Another important issue for producers is the high input cost, mainly due to imported seeds and fertilizers. Organic procedures could be taken into account since they do not use many inputs, so since the labor costs are low it seems to be a viable option to reduce input costs. Furthermore, seeds shortages could be overcome by an installation of “Seeds Banks”, which are storages of local seeds maintain over the years for genetic improvement and as a store of seeds in difficult periods or periods with high input prices.

Development of the pig value chain that benefit the poor needs strong support and involvement of the government. Rapid urbanization and rising income might contribute to a longer and more complex livestock value chain and increase concerns for food safety. These food safety issues are likely to pose new constraints to smallholder participation and ability to compete in modern markets. Arrangements between primary producers, processors, and distributors are necessarily becoming increasingly sophisticated in this situation. Due to high transaction costs in designing and implementing agreements between an upstream chain actor with a number of small-scale and scattered pig farmers, proactive policies and investments can help ensure inclusion rather than exclusion of the poor who produce and sell on a small scale.

MARD has played a key role in designing pro-poor policies and rural poverty alleviation in Vietnam. It has implemented a number of policies to support, invest in, and promote the livestock industry and pig value chain specifically. However, there are still gaps that need to be considered, especially the fact that MARD strongly emphasizes the production side with little attention paid to product marketing and the accompanying issues of supply vs. demand, distribution, and prices. Therefore, smallholders might still face risks for not being able to market their products.

In Vietnam, the pig value chain offers livelihood opportunities for the poor. High and increasing demand for pork and consumer preferences present market opportunities for smallholder pig producers in Vietnam. Developing the pig sector to benefit poor people will improve their income and stimulate pork demand for the entire economy.

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Annex 1. Research and Development Institutions in Viet Nam

INSTITUTE	ORGANIZATIONAL STRUCTURE	FUNCTIONS & TASKS	CONTACT
Vietnamese Academy of Agriculture Sciences (VAAS)	<p>The 18 research institutes and centres that operate under VAAS include: Cuu Long Delta Rice Research Institute (CLRRI); Southern Horticulture Research Institute (SOFRI); Institute of Agricultural Science for Southern Vietnam (IAS); Sugarcane Research Institute (SRI); Plant Resource Centre (PRC); Institute for Agricultural Environment (IAE); Soil and Fertilizer Research Institute (SFRI); Plant Protection Research Institute (PPRI); Agricultural Genetics Institute (AGI); Northern Mountainous Agriculture and Forestry Science Institute (NOMAFSI); Fruits and Vegetables Research Institute (FAVRI); Maize Research Institute (MRI); Vietnam Sericulture Research Centre (Vietseri); Centre for Technology Development and Agricultural Extension (CETDAE); Field Crops Research Institute (FCRI); Agricultural Science Institute of Northern Central Vietnam (ASINCV); Agricultural Science Institute of Southern Coastal Central of Vietnam (ASISOV); Western Highlands Agro-Forestry Scientific & Technical Institute (WASI).</p> <p>Staff: total 2 674, including 31 Professors and Associate Professors, 207 PhD, 599 MSc.</p>	<ul style="list-style-type: none"> - To provide a comprehensive vision, strategic direction and oversight of agriculture R&D programs; - To conduct basic and applied research and to foster the transfer of new technologies; - To provide post-graduate and professional training; - To implement scientific activities in the following areas: Genetic resource conservation of plants, animals and micro-organisms; Plant and animal breeding and genetics; Agricultural biotechnology; Soil science; Plant and animal nutrition; Plant protection and animal health; Agricultural environment and ecology; Climate change mitigation and adaptation; Agrarian and farming systems; Food safety; Integrated farming technology; Rural development; Technology transfer and extension; Post-graduate training and capacity building; International cooperation. 	<p>Address: Vinh Quynh, Thanh Tri, Hanoi Tel: 84-4-38615487 Fax: 84-4-38613937 Website: www.vaas.org.vn</p>
Vietnamese Academy of Forest Sciences (VAFS)	<p>VAFS comprises 4 research institutes, 3 research centres, 2 regional institutes and 4 regional centres: Silvicultural Research Institute (SRI), Forest Industry Research Institute (FIRI), Forest Tree Improvement and Biotechnology Research Institute (FTIBRI), Forest Ecology and Environment Research Institute (FEERI), Forestry Economics Research Centre (FERC), Forest Protection Research Centre (FPRC), Non-Timber Forest Products Research Centre (NTFPRC); Forest Science Institute of South Vietnam (FSISV), Forest Science Institute of Central Highlands and South of Central Vietnam (FSICHSCV), Forest Science Centre of North Western Vietnam (FSCNWW), Forest Science Centre of Central of North Vietnam (FSCCNV), Forest Science Centre of North-Eastern Vietnam (FSCNEV), Forest Science Centre of North of Central Vietnam (FSCNCV).</p> <p>Staff: total 477, including 6 Associate Professors, 1 Doctor of Science, 31 PhDs, 40 PhD. candidates, 100 Masters of Science and Master of Science candidates, and 230 Engineers and University graduates.</p>	<ul style="list-style-type: none"> - To implement scientific research, technology transfer and development, technical standards and economic evaluations related to forestry; - To provide post-graduate training, international cooperation, advisory services and business regarding forest research, development and extension in Vietnam; - To advise the Minister on the strategic direction of forest research for the long term, including a five year plan and annual programs; - To assess, monitor and evaluate programs and projects related to forestry; - To implement basic and applied research in various fields of forest science including: Silviculture and ecology of tropical forests; Sustainable management of forest resources; Forest genetics; Seeds selection, storage and preservation; Bio-technology in forestry; Ecological restoration, protection and conservation; Sustainable forest land use; Climate change and environmental monitoring; Non-timber forest products; Forest policy; Production systems. 	<p>Address: Duc Thang, Bac Tu Liem, Hanoi Tel: 84-4-38389031 Fax: 84-4-38389722 Email: ykhln@vafs.gov.vn Website: http://vafs.gov.vn/en/</p>
Vietnam Academy for Water Resources (VAWR)	<p>VAWR comprises 3 regional institutes, 7 specialized institutes, 3 centres and 2 companies: Institute for Water and Environment, Central Vietnam Institute for Water Resources, Southern Institute for Water Resources Research; Institute for Pump and Water Resources Machines, Institute for Water Resources Economics and Management, Institute for Coastal and Offshore Engineering, Institute for Ecology and Works Protection, Institute for Hydraulic Construction, Institute for Hydropower and Renewable Energy, Key Laboratory of River and Coastal Engineering; Centre for Water Resources Software, Centre for Training and International Cooperation, Centre for</p>	<ul style="list-style-type: none"> - To advise the Ministry of Agriculture and Rural Development (MARD) on the national strategy, programs, plans in science and technology of irrigation, hydropower, environment, prevention and mitigation of natural disasters and adaptation to climate change; - To provide a scientific foundation for planning socio-economic development throughout the country and territories; institutional development policies, economic and technical norms on water, environment, construction, management, operation of irrigation structures, equipment and hydropower; - To implement research and transfer 	<p>Address: 171 Tay Son, Dong Da, Hanoi Tel: 84-4-8522086 Fax: 84-4-5632827 Website: www.vawr.org.vn</p>

	<p>Participatory Irrigation Management; Construction and Water Resources Technology Transfer Company, Other companies.</p> <p>Staff: over 1 500 members including 28 Professors and Associate Professors, 65 PhD, 267 MSc and more than 1 000 engineers and BSc.</p>	<p>advanced technology for production, national security and defense, disaster reduction and climate change adaptation;</p> <ul style="list-style-type: none"> - To provide international cooperation and training of highly-qualified human resources; - To organize production, business and export, import in accordance with law. 	
<p>National Institute of Animal Sciences (NIAS)</p>	<p>NIAS comprises 9 research departments and stations, 11 institute's branches and research units and one joint-venture company: Department of Animal Nutrition and Feed, Department of Forage Production, Department of Animal Genetic and Breeding, Department of Animal Psychology, Bio-chemistry and Behaviors, Department of Rare Animal and Bio-diversity, Department of Economics and Farming System, Department of Livestock Environment, Department of Animal Products and Animal Feed Analysis, Department of Animal Products Processing, Preservation and Food safety; Branch of NIAS for Southern Vietnam (HCMC), Key Laboratory of Animal Cell Technology, Thuy Phuong Poultry Research Center, Thuy Phuong Pig Research Center, Animal Experiments and Domestic Animal Conservation Center, Lareg Ruminant Breeding Center, Livestock Research and Training Center, Dai Xuyen Duck Breeding and Research Center, Ba Vi Cattle and Forage Research Center, Son Tay Goat and Rabbit Research center, Northern Mountainous Livestock Research and Development Center, Livestock Research and Development Center in Central part of Vietnam; Guoyomarc'h-VCN joint venture company (in collaboration between NIAS and Guyomarc'h nutrition animale, France).</p>	<ul style="list-style-type: none"> - To formulate, submit and implement the oriented basic research, applied researches projects and annual programs, 5 year programs and long term programs on Sciences and technology of animal production; - To implement the basic research, applied research on livestock production such as: Animal genetic and breeding; Pure animal breed conservation; Animal genetic conservation and the animal forage trees; Animal Bio-technology; Bio-diversity and Bio-informatics; Animal reproductive, physiology and behaviors and animal health; Animal feed and nutrition, pasture and forage production; Animal farming system and economics, livestock environment and effect of livestock production to the environment and climate; Animal housing and management, Animal products processing and storage, animal product hygiene - To build economical technical criteria, process, and standards in animal production; - To participate in the study, commending and proposing of policy orientation, strategy of animal development and test on livestock breeding, animal feeding, livestock science and environment, etc.; - To implement international cooperation on livestock research and production, technology transfer, human resource training on animal production, science and technology information etc.; - To organize the animal production business, animal import and export. 	<p>Address: Phuong Thuy Phuong, Quan Bac Tu Liem, Thanh Pho, Hanoi Tel: 84-4-38389267 Fax: 84-4-38389775 Email: admin@nias.org.vn Website: http://vcn.vnn.vn/</p>
<p>National Institute of Veterinary Research (NIVR)</p>	<p>NIVR comprises 8 research departments and units: Department of Virology, Department of Bacteriology, Department of Parasitology, Department of Pharmacology, Department of Animal Hygiene and Toxicology, Department of Immunology and Pathology, Department of Research and Extension, Unit of Experimental Production.</p>	<ul style="list-style-type: none"> - To conduct scientific research serving for epidemic disease prevention in livestock and aquatic animals in Central and Highland provinces of Vietnam; - To study and applying biotechnology in veterinary, animal husbandry, aquaculture and environmental treatment; - To transfer advanced techniques, applied technologies for veterinary and animal husbandry services and to participate in training human resources in the field of veterinary medicine; - To provide diagnostics and prevention services for animal epidemic diseases in Vietnam; - To produce variety of vaccines, bio-substances and veterinary medicines for the prevention of epidemic diseases in livestock and aquatic species; - To trade, import and export materials, chemicals, bio-substances and veterinary medicines. 	<p>Address: 61 Truong Chinh Street, Nga Tu Vong, Dong Da, Hanoi Email: vet.inst.hanoi@usa.net Website: under construction</p>
<p>Vietnam Institute of Agricultural</p>	<p>VIAEP comprises 6 research departments and 8 units immediately under the institute: Department of Measurement and Automation,</p>	<ul style="list-style-type: none"> - To implement strategies, policies, researches, and public services related to agricultural engineering and post-harvest 	<p>Address: 60 Trung Kinh, Trung Hoa, Cau Giay, Hanoi Email: viaep2004@yahoo.com</p>

Engineering and Post-harvest Technology (VIAEP)	<p>Department of Technology and Equipment for Food Preservation, Department of Post-harvest Biological Technology, Department of Animal Husbandry Mechanization, Department of Agricultural By-products and Environment, National Electrical Mechanical Laboratory – VILAS 019; Center for Testing and Evaluation of Machinery and Equipment, Center for Technology Transfer and Consultancy on Investment, Center for Development of Agricultural Engineering, Center for Research and Control of Food Quality, Research Center for Agricultural Machinery and Aero-hydraulic Machines, Research Center for Processing of Agro-products and Foodstuff, Center for Research and Technology Transfer in Agricultural Engineering in the Central (Hue City), Sub-Institute of Agricultural Engineering & Post-harvest Technology (HCMC).</p>	<p>technologies;</p> <ul style="list-style-type: none"> - To implement technology transfer and international cooperation; - To implement production and trade in engineering and post-harvest technology for agriculture and rural development nationwide; - To provide post-graduate education. 	<p>Website: http://www.viaep.org.vn/</p>
Research Institute of Aquaculture I, II, III (RIA1/RIA2/RIA3)	<p>RIA is composed by 3 institutes: the Research Institute for Aquaculture No. 1 (based in Bac Lieu near Hanoi), the Research Institute for Aquaculture No. 2 (based in Ho Chi Minh City), the Research Institute for Aquaculture No. 3 (based in Khanh Hoa province, Central Vietnam). RIA1 comprises 9 centres and sub-institutes: Centre of Environment and Disease Monitoring in Aquaculture, Northern National Broodstock Centre for Mariculture, Aquaculture Research Sub-Institute for North Central, Centre of Aquaculture Biotechnology, National Freshwater Broodstock Centre, Centre of Aquaculture Technology Transfer, Research Centre for Coldwater Resources, Research Centre of Aquatic Biodiversity and Resources, Tilapia Research Centre.</p>	<ul style="list-style-type: none"> - To carry out scientific and technological research in the field of aquaculture, including: Genetic and Seed production; Aquaculture techniques; Environment management and disease prevention; Resource protection and development for coastal and freshwater areas; Post-harvesting technology; Technology innovation and transfer; - To provide direction for research on aquatic technology and science and other relevant fields; develop plans for aquatic technology in the long term, every 5 years, and implementing every year after gaining approval from MARD; To identify the potential and capacity of aquaculture development; - To carry out research on and apply science and technological advances for cultivation, exploitation, conservation and protection of aquatic resources to satisfy the requirement of local consumption and export; - To implement the following activities: apply research results to trial production; transfer process of advanced production technology; draw up production processes; contribute to building sector standards, economics and technical norms and management regulations for aquaculture development; - To import and export aquatic products, equipment and raw materials used for aquaculture, processing and services (new function); - To collaborate with other institutions to supply services and consultancies regarding techniques, technology and science and other relevant fields to organizations and individuals both domestically and internationally (new function). 	<p>Address: Dinh Bang, Tu Son, Bac Ninh Tel: 84-043-8273069 Fax: 84-043-8273070 Email: vanphong@ria1.org Website: http://ria1.org/ria1/</p>
Research Institute of Marine Fisheries (RIMF)	<p>RIMF comprises 6 research laboratories and 5 attached units: Research Laboratory of marine resources, MPA Research Laboratory, Technology Research Laboratory operated, Technology Research Laboratory harvest, Research Laboratory marine biotechnology, Marine science laboratory; Seafood Research Institute South (Vung Tau City), Center for Marine Environmental Monitoring (Hai</p>	<ul style="list-style-type: none"> - To perform the function of scientific research, technology transfer, training, international cooperation and consulting and services for the conservation and development of marine resources; mining and processing of seafood in the country. - To develop and submit to the Ministry strategic planning and long-term, five-year and annual programs and projects of 	<p>Address: 224 Le Lai, Ngo Quyen, Hai Phong Tel: 84-3-13836656 Fax: 84-3-13836812 Website: http://www.rimf.org.vn/</p>

	Phong), Forecast Centre fishing grounds (Hai Phong), Fisheries Development Center Beibu Gulf (Hai Phong), Centre Consulting, production, service and technology transfer seafood, (Hai Phong).	<p>exploitation, conservation and development of marine resources and the organization implemented after being approved by the Ministry;</p> <ul style="list-style-type: none"> - To develop and submit to the Ministry the national standards, national technical regulations, and economic norms, techniques, procedures, rules and technical guidance in the field of mining; - To implement the scientific basis of remote sensing technology, oceanography and ecology; study of marine resources, the rule changes of marine resources and fisheries biology serves forecast ocean fisheries and fisheries management; relationship between the environment, marine resources and marine fisheries; effects of climate change to marine fisheries; microorganisms in environmental remediation; economic issues - fisheries society; fisheries management model; organizational models of production, and exploitation; biodiversity and marine conservation. 	
National Institute of Agricultural Planning and Projection (NIAPP)	Data not available because of website not available in English		<p>Address: 61 Hang Chuoi, Hanoi Tel: 84-4-39716408 Fax: 84-4-38214163 Email: khoahoc@niapp.org.vn Website: http://www.niapp.org.vn/</p>
Vietnam Institute of Fisheries Economics and Planning (VIFEP)	Data not available because of website not available in English		<p>Address: 10 Nguyen Cong Hoan, Ba Dinh, Hanoi Tel: 84-4-38345674 Fax: 84-4-38345674 Email: vifep@vifep.com.vn Website: http://www.vifep.com.vn/vn/</p>
Vietnam National University of Agriculture (VNUA)	RESEARCH INSTITUTES AND CENTERS: Institute of Agro-Biology; Institute of Economics and Development; Institute of Engineering Technology Development; Institute of Crops Research and Development; Center for Agricultural Research and Ecological Studies; Center for Experimentation and Vocational Training; Center for Interdisciplinary Research on Rural Development; Center for Consultation on Natural Resources and Environmental Technologies; Center for Tropical Plant Pathology; Center for Conservation and Development of Crop Genetic Resources; Center for Training and Application of Advanced Technologies.		<p>Address: Ngo Xuan Quang, Trauquy, Gialam, Hanoi Tel: 84-4-38276346 Fax: 84-4-38276554 Email: webmaster@vnua.edu.vn Website: http://www.vnua.edu.vn/</p>
Vietnam Forestry University (VFU)	RESEARCH INSTITUTES AND CENTERS: Institute of Biotechnology; Center for Biodiversity; Centers for Services; Center for Research and Technological Transferring in Forest Industry; Institute for Forest Ecology and Environment.		<p>Address: Xuan Mai, Chuong My, Hanoi Tel: 84-4-33840233 Fax: 84-4-33840063 Email: lienhe@vfu.edu.vn Website: http://www.vfu.edu.vn/</p>
Water Resource University (WRU)	FACULTIES AND DEPARTMENTS: Faculty of Economics; Faculty of Energy Engineering; Faculty of Water Resources Engineering; Department of Hydrology and Environment.		<p>Address: 175 Tay Son, Dong Da, Hanoi Tel: 84-4-38522201 Fax: 84-4-35633351 Email: tth@tlu.edu.vn Website: http://en.tlu.edu.vn/</p>
Bac Giang Agriculture and Forestry University (BAFU)	Data not available because of website not available in English		<p>Address: Bich Son, Viet Yen, Bac Giang Tel: 84-0240-3874265 Fax: 84-0240-3874604 Email: admin@bafu.edu.vn Website: http://bafu.edu.vn/home/</p>

Annex 2. Tariff Profile of Viet Nam

Viet Nam

Part A.1 Tariffs and imports: Summary and duty ranges

Summary		Total	Ag	Non-Ag	WTO member since	2007
Simple average final bound		11.5	19.1	10.4	Binding coverage:	Total 100
Simple average MFN applied	2014	9.5	16.3	8.4		Non-Ag 100
Trade weighted average	2013	5.1	7.3	4.9	Ag: Tariff quotas (in %)	1.1
Imports in billion US\$	2013	130.7	11.8	118.9	Ag: Special safeguards (in %)	0

Frequency distribution	Duty-free	0 <= 5	5 <= 10	10 <= 15	15 <= 25	25 <= 50	50 <= 100	> 100	NAV
	Tariff lines and import values (in %)								
Agricultural products									
Final bound	8.7	15.9	18.9	8.8	20.8	24.4	2.3	0.3	0
MFN applied 2014	15.5	16.7	16.2	10.6	17.0	23.0	0.7	0.3	0
Imports 2013	44.5	26.7	8.7	5.6	9.3	5.2	0.0	0.0	0
Non-agricultural products									
Final bound	15.0	34.0	13.6	12.8	20.1	4.1	0.4	0.0	0.0
MFN applied 2014	38.4	19.4	7.2	12.9	18.0	3.6	0.3	0	0
Imports 2013	56.5	14.1	8.2	14.4	5.6	1.2	0.1	0	0.2

Part A.2 Tariffs and imports by product groups

Product groups	Final bound duties				MFN applied duties			Imports	
	AVG	Duty-free in %	Max	Binding in %	AVG	Duty-free in %	Max	Share in %	Duty-free in %
Animal products	15.0	7.0	40	100	14.2	8.3	40	0.2	6.5
Dairy products	16.6	0	35	100	9.6	9.5	20	0.5	10.4
Fruit, vegetables, plants	21.2	8.1	40	100	20.1	8.0	40	1.0	4.3
Coffee, tea	26.8	0	40	100	26.8	0	40	0.1	0
Cereals & preparations	20.9	2.6	80	100	17.3	12.6	40	2.0	3.9
Oilseeds, fats & oils	11.6	1.4	35	100	8.4	15.7	35	2.7	79.3
Sugars and confectionery	33.3	12.5	100	100	17.8	11.8	40	0.2	8.4
Beverages & tobacco	50.2	0	135	100	43.0	0	135	0.3	0
Cotton	14.0	20.0	20	100	6.0	40.0	10	0.9	100.0
Other agricultural products	7.6	24.3	20	100	6.6	43.2	20	1.2	66.7
Fish & fish products	17.7	1.2	35	100	15.6	8.6	35	0.7	42.1
Minerals & metals	11.2	11.7	60	100	8.0	39.0	45	15.6	61.7
Petroleum	34.2	0	40	100	11.9	11.1	20	6.5	13.2
Chemicals	6.1	8.7	27	100	3.1	61.7	27	13.4	59.8
Wood, paper, etc.	11.5	15.4	25	100	10.4	25.3	25	2.8	40.9
Textiles	10.4	0.3	100	100	9.6	11.5	100	8.8	11.3
Clothing	19.9	0	20	100	19.8	0	20	0.4	0
Leather, footwear, etc.	14.1	1.9	35	100	12.9	15.2	35	2.4	13.8
Non-electrical machinery	5.7	34.6	50	100	3.3	64.3	50	11.3	77.0

Electrical machinery	9.7	31.5	35	100	7.9	49.5	35	23.8	78.3
Transport equipment	22.2	21.6	198	100	17.5	37.2	75	2.4	40.9
Manufactures, n.e.s.	10.3	38.2	35	100	9.8	42.0	35	2.9	56.0

Exports to major trading partners and duties faced

Part B

Major markets	Bilateral imports		Diversification		MFN AVG of traded TL		Pref. margin	Duty-free imports	
	in million		95% trade in no. of		Simple	Weighted	Weighted	TL	Value
	US\$		HS 2-digit	HS 6-digit				in %	in %
Agricultural products									
1. European Union	2013	2,290	10	24	13.9	1.4	0.5	19.3	90.8
2. China	2013	1,843	6	10	15.8	30.4	18.3	91.8	63.3
3. United States of America	2013	1,424	8	21	3.8	0.4	0.0	32.8	86.8
4. Malaysia	2013	528	12	27	18.5	24.6	1.3	50.5	34.9
5. Japan	2013	430	19	48	17.1	8.5	6.4	48.3	69.3
Non-agricultural products									
1. European Union	2013	25,412	42	310	5.0	3.5	1.4	62.3	72.4
2. United States of America	2013	22,840	40	324	4.6	8.6	0.0	42.2	41.5
3. China	2013	15,048	42	211	10.5	3.3	3.0	97.7	96.6
4. Japan	2013	13,657	64	632	4.3	3.6	3.0	92.3	91.9
5. Korea, Republic of	2013	6,726	76	1,153	7.9	8.5	0.0	11.8	7.3

Source: WTO Tariff Download Facility <http://tariffdata.wto.org/>

Annex 3. Food Safety in Viet Nam

Current status: food safety of agro-products

Agro-production has recorded remarkable achievements in quantity, quality and value in Viet Nam. The restructuring and reform of the agriculture sector has been being implemented and obtained initial encouraging results, making a contribution to better life for the people, security for the society and sustainability for the development. The consumption, production linkage, quality management, processing, scientific and technological application and export problem solution have been paid special attention. Agro-production in 2014 estimatedly increased by 3.86% in comparison with 2013 (prices in 2010 were used), in which agriculture, forestry and fisheries increased by 2.86%, 7.09% and 6.82% respectively. This helps to stabilize the macro-economy, control inflation and ensure the social security.

Besides the said achievements, not a few food safety problems have arisen, particularly a range of unsafe food cases affecting the consumers' health; abuse of pesticides, veterinary medicines and chemicals in production and trading of agro-products. These are causing serious concerns in the society. The production and use of unsafe food not only result in negative effects on human health, work capacity and life quality in daily life and long term. They also hinder the market access for a lot of high value agro-products with potential in Viet Nam. Facing the increasingly competing market, some of the big export markets have been lost and the risk in keeping the domestic market is getting more and more serious.

In the context of the continuously developing production, population growth, rapid urbanization and increasing demand of the consumers and abroad markets for product quality the management and control of food safety is getting an urgent issue which needs a synchronous and oriented strategy (and this strategy has effective measures in production in order to ensure safety, hygiene and matches the development strategy of agriculture, fisheries and salt production).

The inspection in the first 9 months of 2015 shows that 7,334 agro-product production and trading establishments were examined and ranked, including 1,504 establishment were ranked C (accounting for 20.5%). 676 establishment ranked C were re-examined (accounting for 45%), higher than in 2014 (27.9% of establishments were re-examined). After the re-examination, 536 establishment remained C (79%). The establishment ranked C and the re-examined establishments are mainly slaughtering and processing establishments. In other words, in the first 9 months of 2015, about 68% of C establishments were re-examined and 21% of them were upgraded.

The food safety monitoring on a large scale in the first 9 months of 2015 reveals a high percentage of samples violating food safety regulations, some food safety indicators have not been improved in comparison with 2014 (1.01% fishery samples contained chemicals and anti-biotics exceeding the limits; 10.3% of vegetable samples contained pesticide residue exceeding the limit; 16% of meat samples were contaminated with Salmonella, and 7.6% of meat samples contained chemical and anti-biotic residue exceeding the limit).

The above result shows that despite big improvements, a lot of problems in food safety of agro-products remain and the expectation of the people and managers for the food safety has not been realized (FAO, 2016).

Laws and institutions

With the recent adoption of the new Food Safety Law (2010), Viet Nam maintained the multiple-agency system for food safety control but streamlined the responsibilities of each of the lead agencies. The lead agencies are MARD, MOH, and MOIT. The MOH through the Viet Nam Food Administration (VFA) continued its role as the lead agency for policy, as well as for setting standards and technical regulations and coordinating communication and public awareness activities. It has also received a role of a "secretariat" to the Steering Committee of Food Safety chaired by the Deputy Prime Minister, and is the overall responsible agency for the implementation of the Food Safety Law. The MARD continued its role as the lead agency for the primary production of agri-products, and became the lead agency for the majority of agricultural value chains, such as meats, fish, grains, fruits and vegetables. MOIT is the lead agency for market supervision, and is responsible for quality control

and enforcement of adulteration, smuggling and counterfeit products related regulations. Notably both MOH and MOIT also have specific responsibilities for some groups of products, e.g. food additives (MOH) or alcoholic beverages (MOIT). In terms of specific areas, MOIT is responsible for the (1) beverages and drinks; (2) processed dairy products (both in powder and liquid forms); (3) processed flours (including confectionaries, biscuits, etc); and (4) cooking oils.

In four years since the adoption of the new food safety legislation, its implementation remains challenging. While the Food Safety Law went into effect in 2010, it took considerable time for the Government and respective ministries to promulgate implementation regulations. For instance, the Decree #38 detailing the implementation of key articles of the Law on Food Safety, including task-sharing and responsibilities, was only approved on April 25, 2012. Even more time has been required by the provinces to setup their food safety control systems, which according to the national legislation must mirror the central level systems.

In addition to institutional streamlining of the food control system, another significant feature of the new Food Safety Law is its adoption of the basic principles of the modern food safety control system³. One of the key principles is the risk-based food safety control system. Specifically, Article 3(4) of the Law states that “*Food safety management must be conducted throughout the course of food production and trading on the basis of food safety risk analysis*”. While more time is needed for an in-depth assessment of the implementation capacity for the risk-based food control system, the preliminary findings indicate that this capacity is mostly weak. There are examples of implementation of risk-based principles throughout the value chains (e.g. in export oriented aquaculture and honey sectors), but in most instances the food safety control system mostly focuses on enforcement of quality and safety of final products. Such a gap between a major policy statement and actual implementation is not typical to Viet Nam, and reflects a major challenge for the governments to shift to risk-based food safety control systems.

In order to implement the 2010 Food Safety Law, the “National Strategy on Food Safety 2011-2020 with vision to 2030” was developed, but resources to ensure its full implementation have not been fully identified yet. The VFA under the MOH is planning to review the 5-year implementation plan of the strategy in 2015 to take into account progresses and constraints to-date.

Value Chains and Characteristics of the Food Industry

Much of the food production in Viet Nam is marketed fresh, though the processing sector is demonstrating potential for growth. While fresh/open markets remain the preferred retail channel, supermarkets and small grocery stores are attracting more and more consumers. This is a trend that will continue even strongly in the future, as increasingly urbanizing consumers’ incomes grow. Three major categories for agro-food products essential for Vietnamese diets are: meat (pork and chicken), grains (rice), and leafy vegetables. Therefore, the authorities are focused on the enforcement of food safety for these three major value chains.

High-speed urbanization in two megacities – Hanoi and HCMC – is forcing the city officials to remove slaughterhouses from “downtown” areas. This trend is going to lead to consolidation of slaughterhouses, exit of small slaughterhouses from cities, and creation of large-scale industrial slaughterhouses. This trend will likely cause more food safety/public health issues than solve them (e.g. especially if the water/sanitation systems are not ready to accept additional sources of pollution). Small slaughterhouses (with a capacity of less than dozen pigs a day) are typical in Viet Nam, and most of the slaughter in the country is done through such slaughterhouses.

Another trend, connected to the consolidation of slaughterhouses, is the intention of city officials to establish so called gate markets – wholesale markets for meat/fish in the outskirts of the cities. This is generally driven by the consolidation of the slaughterhouses, because the larger slaughterhouses will have to be able to sell meat to consolidators, who in turn have to have wholesale facilities for distribution. There is also an assumption that larger markets will help keep unsafe food away

³Note that the Bank’s ESW on food safety and agriculture health had specific recommendations on adopting the “5 principles of modern food control system”, which seem to have been taken on board in this new legislation.

from the two cities, because they will have testing facilities. However, in practice this would be difficult to realize. First, if the authorities are successful of keeping unsafe food away from the cities, the food would end up in other areas with less oversight (unless it is destroyed in the premises, which is even less plausible). Second, if the wholesale markets fail to maintain good sanitation practices they would become an additional source or channel of contamination. Third, since the supply chain for meat is extremely short (around 10-15 hours between slaughter and consumption), the wholesale market adds two-three additional layers for food safety hazards (more transportation etc.), especially when there is no cool chain. However, the mission does not argue against the principle of wholesale markets, rather we argue against using wholesale markets to achieve the overall food safety goals at this stage, in the absence of functioning cold chains.

Food Safety Risks

Chemical contamination – heavy metals, antibiotics and hormones in meat and pesticides in products – remains the main food safety concern both by population and by the government. Microbial contamination is predominantly a concern for exports, although the MOH is conscious that food poisoning events are probably strongly under-reported in the country. Mycotoxin surveillance is mostly common for imported feed and grains. Still, there is overall growing concern in the public about the safety of food, which triggers significant government investment in the enforcement infrastructure (labs etc.).

With regards to national level risk assessment and standards development system, there is more time needed for investigation and analysis of capacity. As mentioned before, the GoV is willing to engage into adopting a risk-based Food Safety control system. Vietnamese agencies in charge of Food Safety are willing to establish a cross—ministerial risk analysis, assessment and profiling system that would feed the implementation of the national strategy and guide surveillance plans and interventions. However, resources, including human capacity (skills and numbers) are lacking to do so and the GoV is seeking long-term support for it.

Infrastructure and Capacity

All laboratories visited during the mission have been fully equipped with modern sophisticated equipment. A lot of investment came from various donor-funded programs, especially from avian flu related programs. In terms of the institutional structure, the laboratory network seems to have a streamlined structure: sub-department (province level) laboratories are in charge of routine surveillance, and regional (7 regions, gathering several provinces) and central laboratories play the role of reference labs, capacity building and certification for exports/imports. Accreditation has been obtained or is underway by some laboratories for specific substances and testing methods, including the ISO/IEC 17025:2005 and MARD accreditation for good Management practices. It highlights that laboratory knowledge and capacity to access this accreditation process is generally available. In terms of human resources, the lower level labs have less capacity and require more training than regional and central level labs. Notable lack of capacity at the lower level labs is with regards to microbiological tests. Most of the microbiological methods are based on traditional tests, which increases the time required for results and therefore reduces the likelihood of any fast response. In the meantime most chemical tests (e.g. heavy metals, antibiotics, toxins) are based on very complex modern methods and equipment, which require established testing methods, including good sample preparation facilities, access to test kits and solid testing experience. It is unclear at this moment whether the sub-department or local level labs have this capacity.

The impression is that the major focus of surveillance at the provincial level is on chemical contaminants of food. Sampling methods for such surveillance are yet to be investigated, but during the site visits the mission noted that most of the samples were taken from final products. It was unclear whether there was a government surveillance program for soil and water testing. Also it was unclear what the feedback mechanism was, and how test results affected the enforcement of regulations.

Conclusion and recommendation

There are still problems in the State management over food safety of producers and traders, mainly focus on control of processing and trading stages. Proper resources have not been invested in initial stages (growing/livestock

production/aquaculture, agricultural material supply) and intermediary stages (collection). No focus has been defined for the control by the producers, traders and State agencies and no specific document on risk assessment and hazard identification has been developed to identify key points to be controlled. The organization of control activities has not been done in a synchronous way in the whole chain, and not consistent among actors in the chain. These are fundamental causes hindering effectiveness of the State management over food safety of vegetables and fruits in particular and products in general.

Annex 4. Survey, evaluation and recommendation for implementation/improvement of vegetable and fruit chain model

Location: Son La province and Hanoi city

No	Content	Initial production	Collection	Processing, packing	Trading
1	Information about establishments in the chain (name and address)	Ta Niet Safe Vegetable Production Cooperative Group (safe vegetable chain in Moc Chau, Son La) 350 tonnes/year	Nguyễn Văn Duyên - Ta Niet Safe Vegetable Production Cooperative Group	Harvesting and packing at production establishment	Big green shop - Thanh Xuân
					Big green shop - Ba Đình
					Fivimart supermarket Võ Thị Sáu
					Fivimart supermarket Hoàng Quốc Việt
					Organic vegetable Tràng An - Linh Lang branch
					Fivimart supermarket Thái Thịnh
					Fivifood processing workshop
					Fivimart supermarket Lê Đức Thọ
					Safe vegetable shop chain Sơn Hà - Hà Nội
2	Establishments located in the local planned areas and granted business registration certificates				
2.1.	Located in the local planned areas	Located in the local planned areas	Granted production and trading licenses	Granted production and trading licenses	Granted production and trading licenses
2.2.	Granted business registration certificates.	Yes	Yes	Yes	Yes
3	Evaluation of the linkage in production and trading among actors of the chain (contract, commitment...)	Actors in the chain have their responsibilities, obligations and rights which are ensured in safe vegetable supply and procurement contracts.			
4	Information about products consumed in the chain (between provinces, export...)	Vegetables and fruits are supplied in the chain, 350 tonnes/year			
5	Evaluation of food safety eligibility at the establishments:				
5.1.	Workshops, equipment, control personnel	Establishments eligible for production in compliance with	Establishments have workshops and processing equipment which meet the related requirements and are granted food safety eligibility		Establishments are granted food safety eligibility certificates

No	Content	Initial production	Collection	Processing, packing	Trading
		VietGAP	certificates		
5.2.	Food safety control at the establishments	<ul style="list-style-type: none"> - Build production procedures and produce in accordance with the procedures - Control chemicals and pesticides applied during the production. - Check farmers' diaries 	<ul style="list-style-type: none"> - Check origin of raw materials, ensure that raw materials are from members of the cooperative group. - Monitor production process - Monitor hygiene conditions in production. 		<ul style="list-style-type: none"> - Monitor hygiene conditions in selling areas - Check origin of the products
5.3.	Establishments are granted food safety eligibility and quality assurance system certificates (VietGAP, HACCP ...)	Production areas are granted VietGAP certificates	Establishments are granted food safety eligibility certificates		Establishments are granted food safety eligibility certificates
6	Information about the products on labels and packing (origin, safe chain and product identification...)	Production diaries are kept but not well recorded as diary recording is not a habit for producers yet.	<ul style="list-style-type: none"> - Procurement diaries are kept. - Labels are available on the packing. 		<ul style="list-style-type: none"> - Procurement diaries are kept. - Labels are available on the packing.
7	Evaluation of major problems.	<ul style="list-style-type: none"> - Producers do not have the same awareness. - Diary recording is difficult as it is not a habit for producers. - No horizontal linkage with agricultural material suppliers. 	No horizontal linkage with packing suppliers		As the information between the two province and city is not very good Hanoi city Sub-AFIQAD (Agro-Forestry-Fisheries Quality Assurance Sub-Department) of has not monitored all the chain traders.
8	Solutions for actors to be eligible to participate in the chain	<ul style="list-style-type: none"> - Support training farmers/workers - Develop linkage 	<ul style="list-style-type: none"> - Support training farmers/workers - Develop horizontal linkage 		<ul style="list-style-type: none"> - Design labels that show product origin. - Formulate a coordination mechanism for chain control among management agencies; and mechanism for information provision.

No	Content	Initial production	Collection	Processing, packing	Trading
9	Other related issues to be evaluated	Safe vegetable chain in Son La-Hanoi has established linkage from initial production to collection, processing, transport, consumption... The related actors have fully participated in the chain model. In order to scale up the chain, only some technical problems should be solved and mechanisms should be formulated for chain control coordination among management agencies and information provision.			

Source: FAO, 2015

Annex 5. Survey, evaluation and recommendation for implementation/improvement of pork chain model

Location: Dong Nai province, Ho Chi Minh city

No	Content	Initial production	Collection, transport	Processing, packing	Trading
1	Information about establishments in the chain (name and address)	1. Lê Công Bình, Hưng Lộc commune, Thống Nhất district 2. Thù Chấm Phòng, Hưng Lộc commune, Thống Nhất district 3. Vũ Thành Lâm, Bàu Cạn commune, Long Thành district 4. Nguyễn Thị Kim Loan, Bàu Cạn commune, Long Thành district 5. Nguyễn Thị Tuyết Hồng, Bàu Cạn commune, Long Thành district 6. Phan Huy Hưng, Phước Thái commune, Long Thành district	CP Company	Anh Hoàng Thy Food Processing Ltd Company (An Hòa 2, An Bình, Biên Hòa, Đồng Nai)	1. Big C Đồng Nai supermarket 2. Thanh Danh Production, Trading and Service Ltd Company (Bình Điền market, Ho Chi Minh city) Big C Dĩ An supermarket – Bình Dương.
		Anh Hao Phat Food One-Member Company (Tân Biên, Biên Hòa, Đồng Nai)		Big C Dĩ An supermarket – Bình Dương.	
		1. Chicken farm of Bình Minh Ltd Company in Võ Đông, Gia Kiệm, Thống Nhất 2. Trần Thị Thơm, Tam Bung, Phú Túc, Định Quán 3. Nguyễn Đức Khương, Tín Nghĩa, Xuân Thiện, Thống Nhất 4. Nguyễn Minh Tuấn, Nam Sơn, Quang Trung, Thống Nhất 5. Phạm Đình Khôi, Nam Sơn, Quang Trung, Thống Nhất 6. Trương Văn Hiếu, Tân Lập 2, Cây Gáo, Trảng Bóm	Bình Minh Ltd Company	Bình Minh Ltd Company	Supermarkets in Đồng Nai, Bình Dương and Hồ Chí Minh
		Nguyễn Thanh Phi Long 1&2, Tân Lập 1, Cây Gáo, Trảng Bóm	Long Bình Industrial Ltd Company	Slaughtering establishment of Nguyễn Hoàng Minh Long	Long Bình Industrial Ltd Company, supermarkets in

No	Content	Initial production	Collection, transport	Processing, packing	Trading
				company	Ho Chi Minh city, Dong Nai province and Binh Duong province
		1. Nguyễn Khánh Tài, Xuân Phú, Xuân Lộc 2. Hoàng Thùy Khuê, Tân Lập 2, Cây Gáo, Trảng Bom 3. Lê Thị Thu, Hưng Thịnh, Trảng Bom 4. Lê Văn Quyết, Tam Phước, Long Thành 5. Ngô Thị Ngọc Bích, An Phước, Long Thành 6. Nguyễn Thị Hà, Bình Chánh village, Tân An, Vĩnh Cửu	Phạm Tôn Ltd Company	Slaughtering establishment of Phạm Tôn Ltd Company	Phạm Tôn Ltd Company and supermarkets in Ho Chi Minh city, Dong Nai province and Binh Duong province
2	Establishments located in the local planned areas and granted business registration certificates				
2.1.	Located in the local planned areas	Located in the local planned areas	Located in the local planned areas	Granted trading licenses	Granted trading licenses
2.2.	Granted business registration certificates	Yes	Yes	Yes	Yes
3	Evaluation of the linkage in production and trading among actors of the chain (<i>contract, committment...</i>)	Horizontal and vertical linkage is sufficient and sustainable			
4	Information about products consumed in the chain (<i>between provinces, export...</i>)	None			
5	Evaluation of food safety eligibility at the establishments				
5.1.	Workshops, equipment, control personnel	Workshops and equipment are sufficiently provided, ensuring production in accordance with VietGAP		Workshops and equipment are sufficiently provided, ensuring food safety conditions in accordance with HACCP	Workshops and equipment are sufficiently provided, ensuring food safety conditions
5.2.	Food safety control at the establishments	- Control systems are built in accordance with VietGAP	- Check origin of raw materials, ensure that raw materials are controlled from producers	- Comply with HACCP	Meet food safety conditions
5.3.	Establishments are	Producers are	Granted food safety	Granted HACCP	Granted food

No	Content	Initial production	Collection, transport	Processing, packing	Trading
	granted food safety eligibility and quality assurance system certificates (VietGAP, HACCP ...)	granted VietGAP certificates	eligibility certificates	food safety eligibility certificates	safety eligibility certificates
6	Information about the products on labels and packing (origin, safe chain and product identification...)	Implement sufficiently the production procedures, ensure traceability.	Implement the collection procedures, ensure traceability.	Sufficient information enables traceability.	Sufficient information enables traceability.
7	Evaluation of major problems.	<ul style="list-style-type: none"> - No model study and evaluation have been done for functional agencies to formulate long term policies for the model scaling up. - The staff involved in developing safe agrifood chain have not been trained on the commodities, value chain, marketing and branding. Therefore, the communication to help consumers identify the products in the chain is not very practical. 			
8	Solutions for actors to be eligible to participate in the chain	<ul style="list-style-type: none"> - Study and evaluate the model development of companies to help local functional agencies define proper and long term policies in order to facilitate the model scaling up. - Organize training courses for the staff involved in developing safe agrifood chain and actors in the chain on the commodities, value chain, marketing and branding. 			
9	Other related issues to be evaluated	-			

Source: FAO, 2015