



Achievements and Issues of the Agro-Food Value Chain in Vietnam

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Vietnam's agricultural export turnover of farm products in 2017 were over \$US 36 billion and is expected to reach \$US 40 billion in 2018. The number of agro-forestry and fishery commodities with the export value of more than \$US 1 billion increased to nine in 2017. The growth of agricultural exports is higher than that of the same period last year, contributing to the GDP growth of the whole country. Nevertheless, the produce rescue due to over-production has repeated in some localities like it happened in previous years. What are the causes and solutions to this problem?

Market failures in the agricultural sector might be the main cause according to the theories of institutional economics in agriculture as well as the national and international practices of the agricultural market. Recently, the agro-food value chain model has been of wide discussion for improving market access. A value chain is a series of activities, which are formed in response to market demand, ranging from the provision of input services to production, harvesting, processing, distribution, and consumption of a particular product (Gereffi G., 2010). The market demand here means the demand of consumers. The value chain institution model brings together modern management solutions that promote and enhance the effectiveness of existing traditional agri supply chains. A value chain is distinguished from a supply chain by the fact that the supply chain is based on the needs of consumers to meet those needs and creates added value through improved selling prices. In order to build this supply chain, it is necessary to have a governing regime within the value chain that allows information transparency regarding product origins, quality, and safety in order to create confidence in consumers. The values generated should be properly distributed among actors of the chain to ensure sustainable cooperation between them.

Rapid changes of agro-food consumption and retail systems

The development of a value chain is motivated by changes in demand for agro-food products through the retail systems. In 2013, the traditional retail system accounted for 75% of the total retail sales with more than 790,000 retail outlets. The retail system in urban areas, however, has transformed swiftly. While there was a total of 921 supermarkets, minimarts, and convenient food stores in 2014, the number climbed up to 3,354 in 2017. The retail system has continuously expanded, mostly in Ho Chi Minh city, followed by Hanoi and Da Nang. Noticeably, consumers are switching gradually from traditional markets to modern retail outlets. A study by the Asian Development Bank (ADB)/Malica reveals the proportion of purchases made at traditional or temporary markets reduced by 8.5% and trading with

street vendors dropped by 35.5% compared to five years ago. Consumers have paid also more attention to certified produce through logos, packaging, and labeling. The most identifiable certification systems to consumers of organic produce are the Participatory Guarantee System (PGS) (51%) and the Vietnamese Good Agricultural Practices (VietGAP) (32%) (Vagneron I. *et al.*, 2018). Nevertheless, consumers remain generally unfamiliar with quality standards, good production practices, and certification systems. The recent issuance of national standards of organic produce and VietGAP has helped form a technical basis for contract farming in the value chain. Research also shows that higher demand for safe produce has created a stable market for farmers.

The farm produce value chains in Vietnam, however, still have limited effectiveness. According to the Ministry of Agriculture and Rural Development (MARD), there are 818 certified value chains of safe produce in 2018 but half of them do not operate well. The reasons include high transaction costs, poor coordination among actors, outdated post-harvest and processing technologies, and lack of technological advances in production. In addition, the biggest obstacle in developing agricultural value chains is identifying leading enterprises who are able to accompany farmers, particularly poor ones, and small producers in remote areas. The value chain knowledge of farmers is still limited while there are absence of guidance and consultation services.

The application of technology in farm produce supply chain has started but has not yet met expectation. According to a Cel Consulting study, the rate of postharvest loss is as high as 32% for vegetables, 18% for meat, and 12% for fish (Cel Consulting, 2018). In particular, logistics for agricultural value chains are efficient since logistic costs account for around 21%-25% of the annual GDP (much higher than those of 6% in Thailand, 12% in Malaysia, and 300% in Singapore).

There is a global trend of applying cooling technologies for the development of the cold chains. Nevertheless, the level of cooling application in Vietnam remains low, such as 33% for fresh milk, 12% for meat, 7% for vegetables, 6% for fruits, except 95% for the fishery chain (ABA, 2018). It is necessary to have a strategy to attract private investment in value chain services and information sharing for linking production areas with logistic services.

Value chain development and technology application for information transparency

Vietnam's value chains involve too many small stakeholders. There are currently 8.61 million small farmers, 20,065 farms, 4,500 agricultural enterprises, 11,688 agricultural cooperatives, and about 20,000 farmer groups (MARD, 2018). Although the participation of various stakeholders is key to the development of value chains, the principal actors should be enterprises, farmers groups, and new cooperatives formed under the 2012 Law on Cooperatives. Enterprises could cooperate with farmers through farmer groups for technology transfer, the application of eco-technology and good agricultural practices, as well as updates and management of traceability information.

Nevertheless, most cooperatives remain weak in management capacity. It is expected when the scheme of 15,000 cooperatives is in place the building of value chains would become easier. In the meantime, some farmers, farm owners, and enterprises have initiated to form the chains by locating the demand of consumption. They realize the transparency of information would facilitate sales and taking part in value chains. Value chain development help them improve their access to markets, increase product value, and thereby limit the situation of produce rescue.

One major problem to solve for a more sustainable agriculture is how to reduce and use cleverly fertilizers and plant protection chemicals. In order to encourage farmers to change their mindsets and practices, it requires extension services in forms of training and technical

transfer as well as the favor from consumers. Under the current context where unsafe produce are rampant, safe agricultural products would be distinct. Farmers whose products are safe should thus participate in value chains to provide consumers with transparent information for market confidence creation.

The application of information technology in value chains for traceability would help cut costs of value chain administration. Up to now, many businesses and cooperatives have initially invested in QR codes and other information applications of traceability which are welcome by consumers. For example, the Association of Food Transparency (AFT) formed in 2017 have already gathered 58 enterprises and cooperatives (<http://thucphamminhbach.org/>). All AFT members must obtain certificates for quality of products such as HACCP, GlobalGAP, VeitGAP, certifications for organic products, and food safety and hygiene certification.

Thanks to technology changes brought about by the Industrial 4.0, numerous enterprises and cooperatives in the world have started to apply the Internet of Things (IoT) and blockchain technology in chain management and traceability of agricultural products. Since traceability has become increasingly important for brand management, the blockchain technology which is cloud-based blocks and developed in 2015 has allowed more cost-effective supply chain management. The advantage of the blockchain technology is its reliability, transparency, durability, and low costs owing to community control rather than relying on the management of a certified company.

Not only the Walmart Group from the United States (US) but other retailers now require blockchain food traceability. The Carefour Group from France (holding 12,000 stores in 33 countries) has started blockchain trace for labels from France, Spain, and Brazil and then will apply the requirement for all labels from all over the world in 2022. Some corporations such as Topco Associates (US) with 15,000 stores and the Wakefern Food Corp (US) with 50 members and 344 stores, as well as BeefChain, Dennick FruitSource and Smithfield Foods also ask for verified blockchain. Before them, users of blockchain include Nestle, Dole Food, Tyson Foods, Kroger, and Unilever. To join the IBM blockchain, enterprises of all production scales have to pay from US\$ 100 to US\$ 10,000 for monthly data storage and equip themselves with RFID tags and stamps. They also have to hire a company to help with operation and connection.

In Vietnam, blockchain technology has been provided by some companies such as Lina Network. Their first clients are three big agricultural groups from Thailand, namely ChokChai, SAP Siam Food International, and AIM THAI, who have signed the memorandum of cooperation at the Spring Agriculture Forum on April 24, 2018 in Vietnam. Among them, ChokChai is the largest dairy group in the Southeast Asia while SAP Siam Food International trading in foods and AIM THAI specializing in dried fruits. The first apply of blockchain technology in Vietnam is particularly in animal husbandry. Ho Chi Minh city has taken the lead in adopting the QR codes following the European standards set by the TE-FOOD company, livestock diaries, and applying electronic records in all stages within the chain. Currently there are six big supermarkets, four wholesale markets, seven farms, and eight traders as its members (<https://te-food.vn/truyxuatnguongoc.php>).

In addition, information technology can allow digital information and easy access via smart phones for information of pesticides, fertilizers, technical processes or other policies.

Policy recommendations for a favorable development of agro-food value chains

The government for a sustainable development of the produce chain has recently introduced a number of policies in order to promote coordination to form large fields and certify the supply chain of safe farm produce. Their effectiveness yet remains limited. Adjustments have

been made also to Decree 107 on rice export, Decree 98 on the promotion of coordination, and Decree 109 on organic products. While waiting for their outcomes, it is still necessary to have integrated and interdisciplinary policies.

The government should provide enterprises and cooperatives participating in the chain with low interest loans in order to facilitate their contract consumption of safe products from farmers and the participation of small farming households in the chain. Industry associations should also be reinforced to improve their governance and competitiveness. In addition, it is necessary to raise awareness of farmers, promote the coordination between enterprises and cooperatives as well as public-private partnerships and investment in infrastructure to attract foreign investors in agriculture. More attention should be paid to planning of production areas in order to encourage application of advanced technology for quality and higher value-added products to meet requirements of importing countries. Besides, policies on supporting services and logistics for agro-food value chain and IT services for agriculture should be also promoted.

Ensuring the cooperation between farmers/cooperatives and enterprises to avoid cancelling or breaking contracts is the most important for the development of value chain. In the cases of chili and watermelon, no quality requirements were set while only verbal commitments were made between farmers and traders for large volume of products, posing high risks for farmers. Practices show that information transparency could help reduce risks in two ways: contracts for quality products and customer diversification through wholesale markets. Farmers should be more proactive in selling their large volume of products at wholesale markets rather than relying on traders only. In the areas where there are no wholesale markets, local governments should provide support in establishing one or creating linkages for farmers. On the other hand, to ensure the reliability of farming contracts, quality standards should be set specifically by buyers together with transparent information, risk sharing mechanisms, and reasonable prices.

On farmers' side, due to a large number of small farming households, it is necessary to organize them into farmer groups or new-type cooperatives to guarantee the supply of qualified products. Cooperation with farmers for many enterprises is not a familiar practice while a lot of farmers have little experience of contract negotiation either. The government therefore could provide support through consultation services and market training. The most popular problem that faces value chain development projects in reality is finding enterprises who are able to be side-by-side with farmers. This requires further local extension services for farmers. Thus, changes need to be made in the approaches and methods of supporting and enabling the participation of farmers in value chains.

The government should focus on developing standards, brands, and systems for food safety certification. Nevertheless, the core issue is the awareness of business and cooperatives in adopting modern management technology such as traceability for supply chain management and minimizing the market failures. Although the application of information technology in chain management has potential, it is still a means only. In other words, it requires also complete institutions for chain management, uniform production process, and updated information in order to build consumers' confidence. Therefore, the most important for farm produce value chain and traceability is the ability of farmers, farmer groups, and cooperatives to provide transparent information. They should be offered with consultation and training for professional business practices. The cooperation between research institutions and universities and enterprises will also facilitate the application of appropriate technology in the value chain.

In brief, clean production, standards-based safety, traceability, and value chain participation are indispensable for all producers across channels of farm produce consumption. Developing farm produce value chain in Vietnam would be an institutional

model for market management, improvement of information transparency to connect producers and consumers, and increase values through satisfying the needs of consumers. By doing this, the produce rescue would be reduced while incomes of farming households and the efficiency of the traditional food supply chain would be improved. The application of information technology in the agro-food value chain is a future trend with plenty of potential to exploit.

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