



## SUSTAINABLE AGRICULTURAL SUPPLY CHAIN – A LITERATURE REVIEW

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### ABSTRACT

Sustainability in the supply chains of agricultural products is a topic increasingly taking concern. Theoretical or empirical studies dealing with this topic have received a lot of attention lately, due to environmental and social responsibility issues. Sustainable agricultural supply chain (SASC) is one of the most important sectors in the world. The number of SASC studies is increasing. Academics and managers, however, need to focus on the full range of SASC's sustainability aspects. This paper reviews previous research related to the topic, discusses the research results in countries around the world and in developing countries, and states suggestions for further research. The literature review indicates resource-based view theory, stakeholder theory and institutional theory have been used the most commonly in the SASC studies. In Vietnam, there have not been many studies on SASC approached from the Triple Bottom Line perspective. This study addresses a topic that is rarely discussed and provides a brief literature review to for a better understanding and recommendations for future research.

**KEYWORDS** : sustainability, sustainable agricultural supply chain, sustainable supply chain, triple bottom line.

### 1. INTRODUCTION

Agriculture has significant contribution to the development of the country or the region, due to its role in the economic and environmental development. Producing agricultural products is a daily activity and a source of employment for millions of people all over the world. For this reason, agriculture plays an important role in escaping poverty in many countries (United Nations, Millennium Development Goals, 2000) (Syahrudin et al., 2011).

The agricultural supply chain has received a lot of attention recently because it is related to environmental and social responsibility issues. The design and operation of the agricultural supply chain should be subject to more stringent regulations and closer scrutiny. This implies that traditional supply chain practices can be modified and replaced to meet the growing demands of sustainability (Ahumada and Villalobos, 2009).

Although the interest in sustainable supply chain management (SSCM) is growing in various aspects, understanding the contribution of a sustainable supply chain to agriculture is relatively new. However, the literature shows the appearance of an SSCM is an important trait in the agricultural sector (Giovannucci et al., 2000; Smith, 2008).

Sustainable agricultural supply chain and sustainable agriculture are one of the most important issues in the world. They impact the economy, environment and society in some countries. In Europe, this sector has significant impacts on the economy, environment and society (Turi et al., 2014). In addition, the agriculture has been brought economic benefits in developing countries. For example, rapid changes in product innovation and processes in the agricultural food supply chain have made a significant impact on the social and economic development in Malaysia (Mohezar and Nor, 2014). Supply chains in sustainable agriculture play an important role because they use a wide range of chain elements from farmers to consumers and have a significant effect on economic, social and environmental performances (Syahrudin et al., 2011).

In a global economy where there is a competitive environment, SASC management is essential to help increase organizational efficiency. Therefore, efforts to manage and improve the efficiency of SASC are necessary to maintain the severe competition in the global marketplace.

### 2. METHODOLOGY OF SUSTAINABLE AGRICULTURAL SUPPLY CHAIN

"A literature review is a systematic, explicit, and reproducible design for identifying, evaluating, and interpreting the existing body of recorded documents" (Seuring and Müller, 2008). It is a synthesis of available research in order to explore and develop issues related to the covered topic (Meredith, 1993). From a methodological perspective, literature reviews can be interpreted as content analysis in which the qualitative and quantitative aspects are mixed to evaluate the structural (descriptive) as well as content criteria (Seuring and Müller, 2008). Due to the limited number of articles on sustainability approaches in the agricultural supply chain, the researchers reviewed the previous based on a thematic approach. This paper uses a mix of inferential and inductive methods in order to provide a comprehensive view of previous studies. This way forms the basis for the literature review presented in this paper.

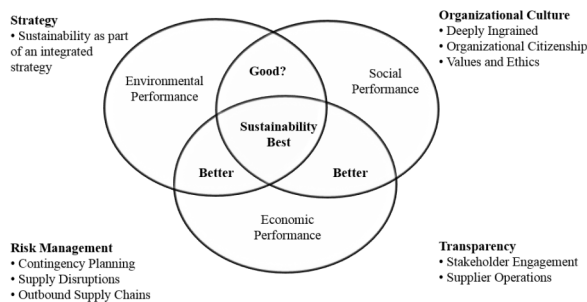
#### 2.1 Sustainability and sustainable supply chain management

The concept of sustainable development has many meanings from different perspectives of businesses, governments, environmentalists, and social reformers. There is no single definition for sustainability. According to the Brundtland Report (WCED, 1987), "Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs". The different definitions of sustainability by researchers simultaneously focus on three aspects of economic productivity, environmental and social performances. Shrivastava (1995) describes sustainability as the potential to reduce long-term risks associated with resource depletion, volatility in energy costs, product liability, pollution and waste management. Carter and Rogers (2008) argue that sustainability is "Strategic, transparent integration and achievement of an organization's social, environmental and economic goals in the systemic coordination of key interorganizational business processes for improving the long-term economic performance of the individual company and its supply chain." Sustainability has become increasingly important for business and practical research in the past decades due to the rapid decline of natural resources and concerns about differences in wealth and social responsibility of the company (Dao et al., 2011). Accordingly, sustainable development can be recognized as a process of economic development and structural change that supports human capacity. In this way, sustainability can be addressed through the sustainable development and balance of human capacities and the ability to take social responsibility, and the future for later generations. The terms "sustainable development" and "sustainability" are often used interchangeably in research (Aras and Crowther, 2009).

The sustainability of agricultural supply chains is one of the

perspectives that can be applied to maintain competitive strategies in economic, environmental and social dimensions. The literature review shows that sustainability of an organization at a broader level consists of three components: natural, social and economic performances. This view corresponds to the idea of three baselines, the so-called Triple Bottom Line (TBL), a concept developed by Elkington (1998, 2004) (Carter and Roger (2008). Among them, the economy aspect includes revenues, costs and customer satisfaction and service levels. Environmental aspects refer to the consumption of natural resources, carbon footprint, environmental law, waste management and the management of toxic chemicals and materials (Varsei et al., 2014). Social aspects consist of impacts on a society such as working conditions, community development, customer health and safety, human rights and child labor (Gosling et al., 2014; Mota et al., 2014).

Sustainable Supply Chain Management (SSCM) is defined as the management of raw material and information flow as well as collaboration among the organizations along the supply chain, while integrating the three-stream selection elements including the three aspects of sustainable development: economic, environmental and social performances (Seuring and Müller, 2008, Erol et al., 2011). Carter and Roger (2008) define SSCM as a strategic, transparent integration and the achievement of the organization's social, environmental and economic goals in coordinating the interorganizational business processes in order to improve the long-term economic efficiency of each company and its supply chain. The SSCM definition is based on three key points and four supportive aspects of sustainability: risk management, transparency, strategy and culture, which are conceptualized and shown in Figure 1. The TBL approach indicates that besides economic efficiency, organizations need to engage in activities that have a positive impact on the environment and society. Although contributions to the TBL concept are still being developed, the integration of the three dimensions is not always fully realized. The literature review shows that there is a lack of agreement regarding the interaction among the three components of the three basic points; it is clear that research is dominated by environmental and green issues (Seuring and Muller, 2008).



**Figure 1: Sustainable supply chain management**

(Source: Carter and Roger, 2008)

## 2.2 Sustainable agricultural supply chain

### 2.2.1 Agriculture sustainability and management of agricultural supply chain

Harwood (1990) defines sustainability in the agriculture system as an agriculture that can grow indefinitely toward greater human utility, greater efficiency of resource use, fewer non-renewable resources, the interaction of the environment and a balance with the environment, which is favorable to humans and to most other species, is structured in accordance with human goals.

In 1988, on the basis of the Bruntland Commission's definition of sustainable development, the FAO Council identified sustainable agriculture and rural development (SARD) as "... the management and conservation of the natural resource base, and the orientation

of technological and institutional change so as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development (in the agriculture, forestry and fisheries sectors) conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable" (FAO, 1989).

The term "Agri-food Supply Chains" (ASC) has been devised to describe activities from production to distribution of farm produce or horticultural products from farm to fork (Aramyan et al., 2006). Agricultural food supply chains are formed by organizations responsible for producing (farm), distributing, processing, and marketing agricultural products to the end consumers. The supply chain of agricultural food includes all inputs, production, post-harvest, storage, processing, marketing and distribution, catering services and consumer functions, including advantageous external environment (Rahim, 2014). The food supply chain, as well as any other supply chain, is a network of organizations that work together in a variety of processes and activities to bring products and services to market to meet the customer needs (Christopher, 2005). What distinguishes the ASC from other supply chains is the importance of factors such as quality and food safety, and the changes associated with weather (Salin, 1998). Other relevant characteristics of agricultural food include limited shelf life, demands, and their price changes, making the supply chain more complex and difficult to manage than other supply chains.

Agricultural supply chain management is the management of valuable activities leading to the conversion of agricultural goods from raw to consumption stage. These activities may include the purchase of agricultural material, the production, marketing, storage and distribution of agricultural products. The actors involved in this process are the farmers and the consumers, the raw input suppliers (farmers), the processors and the human resources involved in transport and storage activities.

### 2.2.2 Approaching sustainable supply chain management in the agricultural sector

Based on Seuring's and Muller's (2008) perspective, this study considers the supply chain of agricultural products from the early stages of the chain. Linton et al. (2007) also find that the supply chain of a product must be tested from the initial processing stage of the material to the delivery of the products to the customers. Supporting these two perspectives, Auroi (2003) recognizes the important role of farmers and consumer associations in improving SSCM in the global marketplace.

According to Syahrudin (2011), the contributions to the SASC can be divided into four main categories: initiatives towards sustainability, practicality in agriculture, renewable energy and the application of technology.

**Sustainability initiatives** - the implementation of international and local regulations or standards, such as the Common Agricultural Policy (CAP) in agriculture, is gaining momentum in the Aging means facing three challenges: (a) profitability – enhancing the viability and competitiveness of the agricultural sector; (b) planet – the ecological challenge to promote good environmental practice; and (c) human – the social challenge to improve the living conditions and economic opportunities in rural areas. In order to face these three challenges, policies and regulations such as CAP are very important. The objectives of such programs should include the improvement of the sustainable agriculture to bring the benefits to both the market and the government, maximizing the potential of the supply chain to contribute to sustainable agriculture and create out of reasonable distribution of costs and benefits (Peeters, 2010). A number of local initiatives, such as the concept of globalization, have also been considered (Peter et al., 2010; Lombard and Leakey, 2010).

**Agricultural practice** - Sustainable Agriculture Practices in the ASC help reduce the environmental impact. Pretty et al. (2008) conducted a long-term study to evaluate several agricultural supply chains of different commodities such as peas, spinach, tomatoes, tea and palm oil in different countries as a way to understand and demonstrate the process approaching a more sustainable supply chain for agricultural products. Pretty (2010) reports that there has been an increase in adoption of sustainable indicators in the supply chain of agricultural products, including social and environmental performances. In good practices, Good Agricultural Practices (GAP) are used most to achieve sustainability. Sustainable agriculture and sustainable agricultural supply chains have been found to provide safer and safer products. In addition, they help to protect nature as well as biodiversity when compared with traditional agricultural practices through the management of irrigation and water use in agriculture, management of insecticide and chemical fertilizer use (Rinaldi et al., 2010), and consider the change of land use and minimize the water overuse (Blackhurst et al., 2010).

**Renewable energy** - SASC is an important trait of biofuels and biomass industry and is a renewable energy source SSAC plays an important role in providing renewable energy to industries that have Reduce the impact of the industry on ozone depletion (Buchholz and Da Silva, 2010; Fischer et al., 2010). This result implies that a sustainable agricultural supply chain can make greater economic impact by providing employment opportunities in the rural areas rather than a normal agricultural supply chain.

**Application of technology** - better access to information is using the existing sophisticated technology. Technological issues have also become an important part of SASC's development over the years. Cleaver and Schreiber (1996) indicate that the limitation of technology use in agriculture limits the sustainability of agricultural practices while Sigrimis et al. (2001) argue for the advancement of sensor technology, information, automation and control in agricultural production and supply chain management. According to Rao (2007), another key to achieve a SASC is the implementation of information and communication technologies (ICTs) as ICTs offer many opportunities for institutionalizing knowledge management in agricultural development.

### 2.2.3 Sustainable agriculture supply chain management

Agriculture plays a major role in maintaining consumers' health, engaging in economic growth and ensuring a reduction in the impact on the environment. Therefore, sustainability is very important to maintain the value, awareness, society and business reputation as well as to enhance the business environment and cooperation in the supply chain. In addition, the implementation of sustainability in the agricultural supply chain can be considered as an effective way to engage stakeholders to cooperate to achieve the common goals (Rota et al., 2013).

#### a. Economic dimensions

Economic dimensions are important factors in food business processes to ensure sustainability. These aspects refer to the appropriate allocation of resources to achieve efficiency and competitiveness to enhance the contribution to society (Leat et al., 2011). In fact, the economic aspects are influenced by social and environmental aspects while they are the most important aspects of sustainable supply chains (Yakovleva et al., 2010).

Economic dimensions can be classified into macroeconomic and micro-factors (Brandenburg et al., 2014). Macroeconomic factors focus on labor productivity, and depend on imports to make economic sustainability for the achievement of a number of goals, such as promoting economic growth, increasing competition (Yakovleva et al., 2012). Microeconomic factors address revenues, costs of production, transportation, and overtime costs, such as economic indicators (Dania et al., 2016). In addition, Yan and Ma (2012) evaluated the economic dimensions using inventory levels and supply costs (procurement), energy and fuel costs, distribution

methods, inefficient operations (internal operation) of packaging material and conformity of packaging and product requirements (product development and management).

#### b. Environmental dimensions

Environmental dimensions include input-oriented (energy and natural resources) and output-oriented indicators (waste and pollution) (Brandenburg et al., 2014). Leat et al. (2011) argue that there are three main types of environmental issues, namely climate change and ecological efficiency, green production and food safety, and animal welfare. Yan and Ma (2012) divide the supply chain environment issues into three categories, namely procurement (raw materials, long-term and short-term supply, waste and packaging), internal operations (water air, soil pollution, health impacts and waste management), and product development and management (product impact, substitution, processing and traceability).

Among many ways to measure environmental impacts, two are the most commonly considered: carbon footprint and life cycle assessment (Hagelaar et al., 2002; Seuring et al., 2004; Fredga and Måler, 2010). Life Cycle Assessment (LCA) assesses the environmental and potential impacts associated with a product, process, or service, while special carbon footprint measures the total amount of greenhouse gases (GHG) emitted directly and indirectly by a person, organization, event or product. In other words, the main difference between LCA and carbon footprint is that LCA includes all quantifiable environmental impacts associated with the product, while a carbon footprint considers only the emission of greenhouse gases. Based on the analysis of the present literature, it can be found that LCA is the most widely adopted method in agriculture and has been in use since 1998, while carbon footprint is a newer approach, with the first contributions came in 2007.

#### c. Social dimensions

Social issues should also be considered in all strategic management processes in the supply chain although these aspects are the most difficult aspects to be measured in comparison with other aspects because it correlates with invisible aspects such as culture, community, human rights and the community desires (Vachon and Mao, 2008; Cambero and Sowlati, 2014). However, social standards such as ISO 26000 and Social Accountability SA8000 are still beyond the organization management system in the agro-food supply chain (Gold et al., 2013). These social aspects support the community development, employment opportunities and social welfare (Leat et al., 2011). Yakovleva et al. (2012) determine the wage and employment in creating a fair market share and in maintaining the productivity. Yan and Ma (2012) supplement the labor standards, life balance, working hours, consumer demand and inflation into indicators of social dimensions. In addition, quantitative indicators have been established to measure social dimensions such as the number of trained staff, management levels with specific environmental responsibilities, and the number of improvements proposed by the staff. (Turi et al., 2014). Cross et al. (2009) refer to a globalized SASC that conforms to international standards such as ISO should bring a better social performance than a localized chain. Hospido et al. (2009) also note that consumer preferences and the choice of agricultural products are sometimes based on perceptions of issues such as child labor and appropriate working conditions.

### 2.3 Theories used in sustainable supply chain management research

Carter and Easton (2011) considered studies on SSCM from 1991 to 2010 and found that these studies incorporated a variety of theories, particularly stakeholder theories and resource-based theories (RBT). Touboulic and Walker (2015), identify 21 related theories in SSCM studies. They include resource dependency theory, dynamic capabilities, relational theory, network theory, agency theory, global value chain, systems theory, contingency theory, actor network theory, complexity theory, ecological modernisation theory, ethical climate theory, exchange theory, industrial network theory, legitimacy theory, organizational learning theory, population

ecology, resource advantage theory, social network theory and structuration theory. A review of the studies shows that the theory of resource-based view (including N-RBV), stakeholder theory, institutional theory, and transaction cost theory are the four most commonly used theories. In this paper, we briefly describe three theories, namely RBT theories, institutional theory, and stakeholder theory (Table 1) to identify the factors theoretically promotes and allows the widespread adoption and development of sustainable practices at the supply chain level.

**Table 1: Key theories in SSCM literature**

Theory	Description	Reference
1. Resource-based view (RBV)	A firm's sustainable competitive advantage emanates from its valuable, rare, inimitable, non-substitutable resources and the unique way they are utilised through core capabilities.	Barney, J. (1991)
Natural RBV (n-RBV)	Harnessing environmental and social challenges within business capabilities is a source of competitive advantage. The imperatives of sustainable development create opportunities for differentiation and increased market power.	Hart (1995)
2. Stakeholder theory	The activities of companies affect both internal and external parties. Corporate social responsibility can be understood as the responsibility for a business to meet the expectations of its various stakeholders. Firms can ensure their long-term survival and preserve their license to operate by taking into account the broad network of actors into their strategy.	Freeman (1984)
3. Institutional theory	External social pressures (coercive, mimetic and normative) influence organisations in adopting socially responsible behaviours and transform their practices to gain social legitimacy. By responding to regulations and imitating their competitors, firms ensure the alignment of their corporate practices with society's expectation.	DiMaggio, P. J. & Powell, W. (1983)

*(Source: Touboulis and Walker, 2015)*

These three theories provide both internal and external orientation that can serve to identify factors for evaluating sustainability and monitoring performances. Although other theories can be integrated, the review has revealed the overlap and integration of these theories to explain the different phenomena of sustainable supply chains. For example, the link among the institutional theory, stakeholder theory and resource-based view has been shown to be complementary (Sarkis et al., 2010).

The overlapping characteristics of these three theories provide support for a multi-dimensional strategic perspective on SSCM. Institutional theory poses some competitive pressure and responses to many internal and external stakeholders (stakeholder theory), while RBV supports a combination of resources among firms that can deal with these competitive pressures. These resources have the interdependence, linkage and exchange of relationships among companies to achieve sustainable results and competitive advantage. Thus, the alignment of these three complementary theories can provide an insight into the needs and application of multidimensional assessments of SSCM.

**3. SUMMARY OF RESULTS OF SUSTAINABLE AGRICULTURAL**

**SUPPLY AND DISCUSSION**

**3.1 Sustainable agricultural supply chain research in the world**

Over the last few decades, many studies on supply chain management issues have been made in the manufacturing and service sectors, but have paid little attention to the agricultural sector, although agriculture contributes a great deal to human livelihoods and materials for other industries (Ganeshkumar et al., 2017).

Vorley (2001) has argued that the agricultural market is undergoing rapid change, with the closed commodity chain rapidly replacing the wholesale or spot markets. The highly concentrated food processing, retail and food service industries at the end of this chain are having an increasingly important impact on decisions made on the farm. Processors and retailers require stringent quality, compliance with standards and codes of conduct and post-production services from suppliers. The reality of sustainability requires a high degree of appreciation for the control of the agricultural value chain and a rapid shift in the balance of power from the government to the company. Small-size peasantry and family farming are protecting their benefits under these systems. The appropriate conditions of government policy, information technology, farmer organizations and corporate responsibility can support fair trade between agribusinesses and small-size peasantry improve quality and consistency of the product.

Wheatley and Peters (2004) analyzed the means and ways to improve the efficiency of SCM in Asian agriculture and recommended that supply chain innovators diversify their activities in different supply chains, carefully consider the stakeholders in the supply chains and the cost-sharing mechanism and the utility of these stakeholders to improve the effectiveness of SCM practices. Improving the supply chain management of agricultural products affects the livelihoods and the welfare of different groups of people. Specifically, it affects different actors in the chain, especially those most dependent on the products, including producers, traders and processors. It also affects the supply chain operators, including input suppliers, equipment manufacturers, credit providers, and research and development institutions.

Taylor (2005) conducted action research and used a value chain analysis (VCA) to highlight significant opportunities to improve supply chain performance, profitability and relationships and develop a new way to apply value chain improvement techniques to a complete supply chain for a farm-to-consumer food product.

Vasileiou and Morris (2006) conducted a descriptive study based on the primary data collected through interviews with 240 potato growers, 17 traders and 4 potato retailers, and analyzed the data using statistic tools. The results showed that all the participants in the supply chain were very interested in maintaining their business and achieved comparative advantages and economic, market, social and environmental factors with their great efforts.

Bala Subrahmanya (2006) conducted a study to identify the various problems facing India's small scale sector in the light of the globalization scenario. His research showed that inefficient infrastructure, insufficient financial support due to low formal credit lines and outdated technology led to poor quality; and low productivity and low capacity utilization were the main annoying issues for small organizations in India.

McCullough et al. (2010) reported on issues encountered by agricultural SCM stakeholders such as farmers, intermediaries and consumers in Madhya Pradesh. Farmers had difficulties in production due to lack of human and financial resources, raw materials and other inputs like fertilizers, pesticides, and information sharing. Other difficulties might involve in marketing such as lack of cold storage, transportation and other infrastructure, weak negotiating capability, inequality in consumer prices and lack of caste and uniformity. Intermediaries face complex issues such as lack of warehousing, classification and uniformity, poor quality and



long-term sustainability of farm products, lack of consistency in demand and supply of agricultural products and knowledge of consumer prices. The complexity to consumers includes low quality, poor inventory due to seasonal fluctuations resulting in abnormal price fluctuations, lack of standardization of agricultural commodities, measurement of fraud and the bargaining capability. Kumar (2011) examined 76 presentations at the 18th annual conference held at the National Academy of Agricultural Research Management (NAARM). The conference discussed SCM activities of agricultural commodities and their contribution to the achievement of food safety and poverty reduction. At the global level, the agricultural sector has encountered the vertical integration and emergence of agricultural supply chains to meet the consumer demands for quality and food safety. Empirical evidence suggests that successful coordination in the value chain has a significant impact on reducing costs and improving farmer income as well as creating positive externalities.

Most researchers believe that SASC can be achieved if each level of the chain uses sustainable activities in its operations. In most agricultural supply chains, transportation is usually managed by road transport. The use of different modes of transport depends largely on the infrastructure, availability of spare parts, and fuel costs (Syahrudin et al. 2011).

Frick et al. (2012) investigated issues related to the supply chain of potato and sheep by interviewing the growers and intermediaries in the supply chain. They found bright prospects in the supply chain of these items. However, they warned that such prospects were highly dependent on the efficient use of fuel and the relation among the components of the supply chain. No supply chain provides a clear advantage. Manufacturers can use different supply chains at different stages of their operations and use multiple supply chains at a time. The success of a supply chain depends on the location, the opportunity, the commitment and the potential for increasing net profits. Supply chain evolves into a value chain where the participants have a highly committed relationship.

Ghai (2012) conducted a descriptive study on the financial aspects of the components of the ASC. Research has advocated the idea that all components of the supply chain need to be linked together and cooperate by sharing ethical benefits among themselves to maintain business through coexistence. In addition, the management of the value chain network should focus on linking the stakeholders closely and sharing, so that the network becomes sustainable, and the process of adding value and delivering become ethical. In the study, the researcher highlighted the key value chain activities in the context of agricultural products and showed the importance of value chain financing that required the attention of donor companies at the national and regional levels.

Dania et al. (2016) studied the cooperation and the sustainable agri-food supply chain, and indicated that sustaining the cooperation among the stages in the agri-food supply chain to achieve sustainability was very complex. All stakeholders involved in these activities could prioritize their financial benefits without ignoring social development and environmental responsibility. The ASC and sustainability are among the most important ones in the world. It creates economic, environmental and social impacts in some countries. The ASC covers all processes and activities from farmers and food and material suppliers, food processors, food processors to increase the value, distributors and retailers through systematic business procedures. Each stakeholder in the ASC endures costs and gains benefits, although sometimes it is unfair to some other stakeholders. Consequently, the supply chain needs to be maintained to spread the benefits along the supply chain fairly and positively.

An SASC has the same components as a traditional food supply chain in terms of transport, storage, transportation, information while the differences between two supply chains are related to waste management, reducing or eliminating it. The effective ASC

requires the participation of all participants: suppliers of raw materials and packaging, transportation, warehousing, and customers. Therefore, the communication should be accurate not only among the chain stakeholders, but also among the involved companies and so should the information circulated on both vertical and horizontal dimensions. They are the main factors with the rise of this activity, the information of goods and services operation. The purpose of any ASC chain is to achieve a flow of goods, services and information completely and effectively to create and provide the maximum customer value. An ASC is considered to be effective if its activities and processes reduce surplus production, minimize inventory, minimize waiting time, and eliminate waste and the items violating the compliance. Regardless of the organizational form of each food supply chain, companies may choose one of the following strategies as a development strategy: a strategic collecting plan, productivity increase, business result improvement, and distribution efficiency increase (Dinu, 2016).

Ganeshkumar et al. (2017) stated that Kit (2010) conducted a descriptive study on SCM-related financial aspects of rural enterprises and advocated for SCM funding including the establishment of the relationships among financial organizations and all stakeholders in supply chain management. The author proposed that financing should be provided to facilitate product flows and establish relationships among different stakeholders in the supply chain in order to contribute significantly to the increased efficiency of SCM practices. One of the key elements of the SSCM is how to ensure fair cooperation among the stakeholders and pay attention to the economic, environmental, social, food safety and the responsibility for the companies, consumers and society. Atre (2008) indicated that the existence of multiple intermediaries in the agricultural supply chain significantly reduced farmers' share of the price paid by the end users (Ganeshkumar et al., 2017).

### 3.2 Sustainable supply chain research in developing countries

According to the United Nations, a developing country is a low-living, underdeveloped industrial base, and a medium to low HDI (Human Development Index) (Education pathways international, 2017).

Although research on supply chain management has made a number of valuable contributions, there is a lack of empirical evidence and theoretical reflection of the characteristics of supply chains that operate primarily in growing and emerging economies. (Silvestre, 2015).

Silvestre (2015) shows that sustainable supply chains are not the destination, but rather a journey because supply chains are geared towards more sustainable practices that go through a complex, dynamic and evolutionary learning process with important innovation. In addition, the research shows that while globalization affects any supply chain, natural resource-based supply chains are geographically limited to natural resource-based countries. (and therefore less maneuverable in terms of location) and limited to the legal characteristics of the countries. The study also shows that supply chains in developing and emerging economies face more barriers to sustainability than the supply chains in developed countries.

In the developing and emerging economies, the two elements of environmental turmoil and institutional barriers - limit supply chains from learning, innovation and development at a pace consistent with their sustainability. If the members in the supply chain and focal companies do not care enough for social issues, or cannot identify or measure the risks involved, the supply chain will fail. If urgent social issues are real, the supply chain will have to face many challenges (Hoskisson et al., 2000; Silvestre, 2015).

Globalization of food chains in transitional countries and developing countries has been adjusted by a number of factors. Some factors are not specific to these countries, such as the

intensification of global trade and investment, and structural change in the global food markets. Specific factors are the liberalization of trade and investment regimes in transitional and developing countries - policy reforms that are often associated with privatization and domestic price reform. In this paper, we focus on factors of particular importance. Liberalization has increased the competition in agricultural markets. Competition will affect fairness and efficiency in the supply chain (Swinnen and Maertens, 2007).

Swinnen and Maertens (2007) evaluated the effects of privatization and globalization of the economy. They found that SCM in countries were in the transitional period of economic development and recognized this process has led to the privatization and global integration of agro-food SCM practices in these countries. Agricultural and food value chains in developing countries have undergone tremendous changes over the past decades. Firms and their ownership have been privatized, market liberalized, and the economy has been integrated into the global food system. The liberalization and privatization initially caused the collapse of the controlled vertical integration. Recently, private vertical coordination systems have emerged and are growing rapidly as a response to consumer demand for quality and food safety and some restrictions on farms' production constraints due to the market imperfection.

According to Noha M. Galal et al. (2016), in developing countries, where the supply chain often requires high-skilled workers and when environmental regulations are still in place, both social and environmental aspects need to be addressed. To achieve sustainability goals, the coordination among supply chain actors is essential. In order to maintain their position and role in the supply chain, each member must adhere to the environmental and social objectives, while the competitiveness ability will be achieved through the fulfillment of customer requirements and economic aspects. The failure of a stage or actor in the supply chain will affect the overall performance and competitiveness of the supply chain system. Developing countries are facing challenges because their economic benefits are dependent on natural resources. The social implications of production activities are neglected (Hutchins and Sutherland, 2008). Therefore, it is necessary to assess the performance of the whole supply chain on three aspects of sustainability. Economic, environmental and social constraints, the three key points in the sustainable development of the agricultural supply chain, are becoming increasingly prominent in developing countries.

Kwarteng (2016) points out that economy and society, not the environment, have positive impacts on the corporate image. In addition, the company's image and society have positive impacts on the company's performance, while the economy and environment seem to have no impact on company's performance. This implies if investments in sustainable structures are not communicated, the stakeholders will not appreciate their relevance and the positive image of the organization may be unpredictable. Therefore, it is necessary to involve the company's image theory in the triple bottom line theory. Second, Kwarteng (2016) demonstrates that the social breadth of sustainability and its significance for competitive advantage are used in the context of the developed and developing market economies, and in a large scale this has resulted in considerable growth in the context of a developing economy.

Sustainability issues in developed countries focus primarily on environmental issues, whereas in developing countries the issues of poverty and equity are significant (Singh et al. 2012). People could argue that sustainable growth will address a growing economy supported by the environment and society.

Although there have been more and more studies on SSCM in the world, in Vietnam in the past few years the number of research approaching sustainability has been limited.

Lam Phan Thanh (2014) identified key sustainability issues in fish and giant tiger prawn farming in the Mekong Delta, Vietnam in the view of different stakeholder groups. One result of the study in terms of measuring sustainability issues in the shrimp value chain was presented in three aspects as follows: (i) environmental issues: water quality, seed quality, and shrimp disease issues are important factors for the implementation of the production chain; (ii) economic issues: input costs are an important element of sustainable development and (iii) institutional issues: regulations and policies that can assist in the development of the system, especially financial policies and regulations on practice and management. The current financial policies for the shrimp industry are mainly policies with short-term support and are not suitable for the shrimp industry that requires long-term investment.

Luu Tien Dung (2016) argues that agriculture development needs to ensure that the benefits are harmonized across four dimensions, including economic, environmental, social and institutional aspects in which farmers are considered to be the center of development. It is necessary for industries to support agriculture in a country, and attention must be paid to create a solid foundation to increase added value and quality of agriculture products. Agriculture extension programs, supporting farmers to apply scientific and technological advances, should be promoted as an important strategy to ensure the growth and sustainable development of the sector. Agricultural businesses and farmers in particular need a great deal of resources to increase their competitiveness in the context of integration.

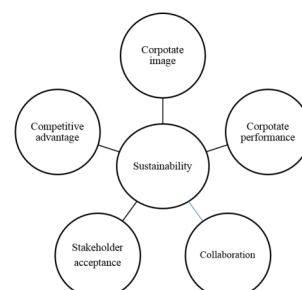
### 3.3 Limitations and directions for future research

Sustainability in the agricultural supply chain management is still very new and there is a lack of empirical research. The studies on this issue have suggested that sustainability in SASC, such as the integration of economic, social and environmental aspects, has impacts on each actor involved in the chain, ensures the product quality, traces the source of the products, minimizes the negative impacts on the environment, and ensures good social security regulations to be remained an area to be developed. The image role of key companies in the chain, the supply chain integration and the interpersonal collaboration should be further considered.

The review of previous studies shows that there is a limited body of research in supply chains in developing countries, especially in the agricultural sector. Together with farming production, a sustainable agricultural supply chain needs to expand to storage, transport, production and distribution, and it requires not only the best factors for the cooperation of the members in the chain but also the best things for the environment and society.

This shows gaps in theory as well as in empirical research on sustainability of the agricultural supply chains in Vietnam. Addressing these gaps will allow us to better understand how and why more research is needed on sustainability in the agricultural supply chains in today's globalization context.

Future research should broaden the analysis to a more comprehensive scope from the initial stages of the chain, especially the role of the farmers. The review of the literature has led to the identification of some topics that may be applicable to future research on SASC. (Figure 2).



**Figure 2: Researchable themes addressing SASC***(Source: Collected by the authors)***4. CONCLUSION**

Sustainable agriculture is very significant to every country because food security and food safety are closely related to public health. Sustainable aspects will play an important role in the strategic direction of all organizations in the sector in the future. For agriculture and agricultural supply chains, achieving sustainability is a long-term goal due to its agricultural features and environmental impacts. In reality, the best supply chain requires chain transparency because the organization's social implications are the synthesis of the inputs and outputs generated throughout the supply chain in society. Converting traditional supply chains to more sustainable practices in the agriculture is a big challenge due to differences between the supply chain actors and the cost for adopting technology and management approaches.

Sustainability and supply chain management are important concepts. Sustainability is one of the perspectives that can be applied to sustain competitive strategies in economic, environmental, and social aspects. A number of studies have discussed all of these factors, but economic studies still get priority to be considered in the analysis of sustainable supply chains. It is important to achieve a better sustainability system for some stakeholders without difficulty with other stakeholders such as farmers and enterprises by collaborating and sharing risks and costs among these stakeholders.

Sustainability in agricultural supply chains is a topic taking more and more concern. However, there have been some research gaps. In the future, an SASC is not only a farming practice, but it also involves storage, transportation, production and distribution, and it involves looking at not only the best for life of members in the chain, but also the best for the environment and society. We believe that further research is needed to understand the multidimensional issues of sustainability. In fact, theoretical reviews show the lack of the methods necessary for assessing the three views, lack of practical contributions to improving performances in three dimensions and indication of limited evidences of what companies are doing to achieve sustainability. This research addresses a specific topic that is not discussed commonly and provides a brief literature review of sustainable agricultural product supply chains. In this way, a better understanding of the SASC concept can be achieved. The limitation of this study is the review of papers selected randomly which does not ensure all relevant contributions have been considered.

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