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Analysis of The Development of A Sustainable Business Model For Horticultural Agriculture (Study at SMK Negeri 1 Trowulan)

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Abstract

This study aims to analyze the Development of a Sustainable Business Model for Horticultural Agriculture at SMK Negeri 1 Trowulan. Indonesia has abundant natural resources and high biodiversity. One of the reasons Indonesia is considered an agrarian country is because the agricultural sector is one of the leading sectors in its economy. Vocational education has undergone significant transformation through various episodes of Merdeka Belajar (Freedom to Learn) initiatives launched by the Minister of National Education and Technology Research, Mr. Nadim Makarim. These programs are based on the goal of 'Link and Match' between the Business, Industry, and Work World (DUDIKA) and vocational education institutions, including Vocational High Schools (SMK) and Vocational Higher Education Institutions. One of the Merdeka Belajar episodes is the SMK PK (Center of Excellence) program in episode 8. Agribusiness in Food Crops and Horticulture (ATPH) is one of the skill packages at SMK Negeri 1 Trowulan. The ATPH skill package continuously and consistently conducts theoretical and practical learning that creates an engaging learning environment, is favored by students, eagerly awaited hour by hour, and leaves a deep impression on all students. The qualitative research method with a case study approach was chosen because it aligns with the research objective, which is to understand how the sustainable business model for horticultural agriculture is developing at SMKN 1 Trowulan. The school can begin developing more practical marketing systems, such as utilizing online platforms and scaling up commodity production. Students can begin to actively participate in large-scale production development, enabling them to delve deeper into business models for entrepreneurship. This prepares them to engage in agricultural entrepreneurship upon graduation, particularly in horticultural commodities. The strengths and weaknesses of the best strategy for developing student entrepreneurship business models at vocational schools must be

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considered. Implementing the Business-to-Consumer (B2C) model involves components such as students, schools, partners, communities, and families. Its implementation begins with students learning agricultural practices on a small scale using school land (during the first year of study) with guidance from teachers and partners.

Keyword: Sustainable business models, horticultural farming, vocational schools, vocational education, agribusiness

INTRODUCTION

Indonesia has abundant natural resources and biodiversity. One of the reasons Indonesia is considered an agricultural country is because the agricultural sector is one of the leading sectors in its economy (Indonesia, Agricultural Country Food Importer, 2011). Agriculture is an economic activity that encompasses the cultivation of food crops, horticulture, plantations, fisheries, forestry, and livestock farming.

One of the agricultural subsectors with potential for development within the agribusiness framework is horticulture. Literally, horticulture is a combination of the Latin words hortus, meaning garden, and colere, meaning to cultivate. (Roedhy et al 2014). Horticulture can be defined as the cultivation of plants that can be grown in gardens or yards. Horticulture is categorized into four types of commodities: vegetables, fruits, ornamental plants, and bio-pharmaceutical plants. Horticultural commodities, particularly vegetables and fruits, are currently flagship commodities but must be supported by suitable land and climate conditions, as well as potential resources and domestic and international market opportunities. In addition to being flagship commodities, horticulture also serves as a source of nutrition for the community, provides employment opportunities, and supports agrotourism and agroindustry activities (Ashari, 2006).

The growth of the horticultural sub-sector is driven by several supporting factors, including increased consumer demand due to rising per capita income, the number of consumers, and changes in consumer preferences. Consumer demand is not only for the domestic market but also for the global market, as free trade significantly influences the dynamics of horticultural agribusiness in every country. Various studies on food have revealed that per capita consumption of vegetables and fruits has a higher income elasticity compared to consumption of other carbohydrate-based foods. This means that economic development that leads to increased household income will result in a higher per capita consumption of vegetable and fruit commodities.

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Vocational High Schools (SMK) as educational institutions are rapidly developing to improve the quality of education by enhancing human resource quality. Vocational High Schools (SMK) aim to prepare their graduates with the necessary skills and competencies to lead independent lives and be ready to work in their respective fields. One such school is SMK Negeri 1 Trowulan, which offers a concentration in Agribusiness, Food Crops, and Horticulture (ATPH). The development of SMKs is contributing to the improvement of educational quality. Educational quality is closely tied to teaching and learning activities within the school. Teaching and learning activities are considered successful if students achieve good academic performance. Academic performance serves as a benchmark to assess students' learning outcomes. Students' academic performance refers to the learning outcomes achieved when they attend classes, complete assignments, and participate in school-based learning activities.

Vocational education has undergone significant transformations through various episodes of Merdeka Belajar (Freedom to Learn) initiatives launched by the Minister of National Education and Technology Research, Mr. Nadim Makarim. These programs are based on the 'Link and Match' objective between the Business, Industry, and Work World (DUDIKA) and vocational education institutions, including Vocational High Schools (SMK) and Vocational Higher Education Institutions. One of the Merdeka Belajar episodes is the SMK PK (Center of Excellence) program in episode 8 (Kemendikbud, 2021). The objective is for each SMK to have a specific center of excellence based on local potential that can have a TEFA (Teaching Factory) as a learning and business venue to prepare students for quick absorption into the workforce. The TEFA concept is one of the vocational learning models that combines training and learning to produce realistic and relevant experiences (Nayang Polytechnic, 2003). This approach includes the basic competencies and skills of Critical Thinking, Creativity, Communication, and Collaboration (4C) (Iskandar, R., and Sudira, P., 2019). In addition to educational objectives, TEFA also aims to train students in entrepreneurship. One aspect of TEFA implementation is the adoption of industry culture, fostering good relationships between schools and industries, and producing goods that meet industry standards (Directorate of Vocational High School Development, 2017). Its development requires time and strong motivation (Suranto et al., 71st National Seminar of Politani Kupang, Kupang, December 7, 2023, 2021). This is supported by the change in the school's status to a BLUD (Local Public Service Agency). To ensure the achievement of the SMK PK program through TEFA and the economic sustainability of BLUD, the business model strategy must be well-designed according to the conditions of each region and the partnership pattern with DUDIKA. To produce a successful business incubator, a mentoring-based support model is required, where partners accompany and actively participate (Hasbullah, R., 2014).

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A business model is a strategy implemented within an organizational structure, processes, and systems. Osterwalder and Pigneur (2010) argue that business models simplify complex business concepts, making them easier to implement. Baden, Fuller, and Morgan (2020) define a business model as a system concept that solves problems through consumer identity, engaging with needs, providing satisfaction, and generating value. This demonstrates that studying business models is useful due to the dual roles and mediation they play. Additionally, Chesbrough (in Teece, 2010) suggests that entrepreneurs can generate income from specific economic outcomes by adapting ideas or technologies to the market through different business models. Osterwalder and Pigneur (2010) popularized the business model and provided nine building blocks.

For the expansion of the understanding of model components in theory, as the central approach highlights the importance of starting with the business model (Flick, 2009). Therefore, the components used require evaluation for further research. Exploring Internet-based properties can significantly alter the competitive landscape in industries. For companies, the benefits of Internet properties can be leveraged as a competitive advantage. This means that companies can use the Internet to gain a long-term competitive edge over their rivals. A company aims to generate financial returns over the long term. As history has shown, strategies can influence the development of business models through various component approaches. According to Geissdoerfer (in Geissdoerfer et al., 2018). Only a few models consider information technology and combine corporate performance management to assess an organization's ability to adapt to internal and external changes, as in the work of Cheah and Ho (2019). Hamel (in Zott et al., 2011), for example, identifies “Core Strategy” as a central component of the business model. Furthermore, there is literature on strategy as an interface component in the writings of Hedman and Kalling (2002), Afuah (2004), Yip (2004), and Tikkanen et al. (2005). This reflects a shared understanding of the implications of corporate strategy through strategic models and business models, where the company's mission or vision is aligned with the strategic path in strategic development. In addition to strategy, material and immaterial resources are viewed as theoretical components (Wirtz et al., 2016). These include the company's internal and external resources, competencies, or capabilities. Thus, a core competency resource model is needed for the company and the assets of the business model. From the conclusion, all tangible and intangible input factors are the most important aspects of the business model (Currie, 2004; Petrovic et al., 2001). Network orientation. Networks and partnerships can have a significant impact on creating corporate value as part of the business model (Wirtz et al., 2016), (in Al-Debei et al., 2008a; Hamel, 2000; Voelpel et al., 2004). The network model encompasses various, mostly external

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interactions of the business model. In this context, it serves as a management tool for auditing and monitoring value distribution through the creation of shared value (Barney, 2004; Wu and Zhang, 2009).

Horticulture is a branch of agricultural science that studies the cultivation of fruits, vegetables, and ornamental plants. The term “horticulture” derives from the Latin words “hortus” (meaning “garden” or “orchard”) and ‘colere’ (meaning “to cultivate” or “to grow”). Literally, the term horticulture refers to the cultivation of fruit, vegetables, and ornamental plants (Janick, 1972; Edmond et al., 1975). However, according to the National Development Plan (GBHN) 1993-1998, in addition to fruits, vegetables, and ornamental plants, medicinal plants are also included in the horticulture category. From a functional perspective, horticultural plants can meet physical needs as a source of vitamins, minerals, and protein (from fruits and vegetables), as well as spiritual needs by providing a sense of peace, tranquility, and aesthetic appeal (ornamental plants/flowers). From a functional perspective, horticulture serves the following purposes: a) improving public nutrition, b) increasing national foreign exchange earnings, c) expanding employment opportunities, d) boosting farmers' incomes, and e) fulfilling aesthetic and environmental conservation needs. However, when discussing horticulture, it is also important to consider the unique characteristics of horticultural products, namely: a) they cannot be stored for long periods, b) they require spacious storage areas (voluminous), c) they are perishable during transportation, d) they are abundant in one season and scarce in another, and e) their prices fluctuate sharply (Notodimedjo, 1997). By understanding their benefits and unique characteristics, the development of horticulture requires strategies and in-depth knowledge about horticultural products to be successful. Horticultural products are one of the agricultural commodities with potential and opportunities for development, making them flagship products capable of improving farmers' welfare in Indonesia, including horticultural products such as fruits, vegetables, medicinal plants, and ornamental plants. Siswono Yudohusodo (1999) states that Indonesia's vast territory with diverse agroclimatic conditions enables the development of various types of horticultural crops. There are 323 types of horticultural commodities, comprising 60 types of fruits, 80 types of vegetables, 66 types of bio-pharmaceuticals, and 117 types of ornamental plants.

Sustainable agriculture is a challenge in the Indonesian agricultural sector that requires farmers to adopt different and improved farming practices with regard to environmental aspects. Vegetables, as one of the horticultural products, are one of the main non-food sub-sectors that are highly vulnerable to the use of chemical substances. Therefore, it is essential to prioritize cultivation techniques with innovative, environmentally friendly, and sustainable characteristics

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to ensure that agricultural practices can continue to advance in meeting Indonesia's food needs (Edufarmers 2022). A sustainable horticultural agribusiness system is a system that combines agricultural techniques, business management, and technology to improve horticultural performance and sustainability. This system focuses on processes to enhance production efficiency and effectiveness, reduce production costs, improve product quality, reduce waste, and increase benefits for both producers and consumers (Wulandari et al., 2020). This system also encompasses aspects such as land management and maintenance, water management, pest and disease control, genetic engineering, risk management, international trade, and information technology (Sridhar et al., 2022).

The core elements of a sustainable agribusiness system include the efficient use of available resources, practices that ensure the sustainability of natural resources, and the development of sustainable business models (Musa & Basir, 2021). These elements are based on an understanding of the social, economic, and environmental benefits that can be achieved through agribusiness activities. Efficient use of resources refers to using available resources in the most efficient way to maximize agricultural output. This includes practices such as crop rotation, water and soil conservation, and minimal tillage. Practices that ensure the sustainability of natural resources involve identifying and implementing practices that will help prevent the depletion of natural resources. This may include the use of renewable energy sources, conservation of soil and water resources, and the use of sustainable agricultural techniques (Azam et al., 2023).

METHOD

The type of qualitative research in this study is a case study. A case study is a research design that can be conducted in various fields where researchers analyze a case in depth, collect complete information using various data collection procedures based on a predetermined time frame. The case can be an event, activity, process, or program (Creswell, 2016:74). The qualitative research method with a case study approach was chosen because it is in line with the purpose of this study, which is to determine how the sustainable business model for horticultural agriculture has developed at SMKN 1 Trowulan.

Data analysis in qualitative research requires conceptualization, which is the process of developing concepts before entering the field. This is followed by categorization and description, which are carried out while in the field. Data analysis in this study uses the Miles and Huberman method. Miles and Huberman (1984) state that activities in qualitative data analysis are conducted interactively and continuously until completion, resulting in data saturation. Data

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saturation is indicated by the absence of new data or information. Activities in analysis include data reduction, data display, and conclusion drawing/verification.

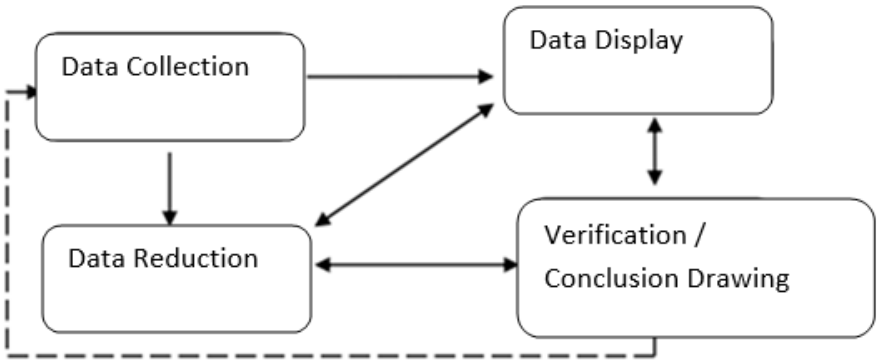


Figure 1. Miles and Huberman's research method

To obtain valid data in this study, appropriate data collection techniques are required. In this study, the researchers used data collection techniques involving observation, interviews, and documentation. This research was conducted at SMK Negeri 1 Trowulan, located at Jalan Mawar No. 1, Trowulan, Trowulan District, Mojokerto Regency, East Java 61362. The research procedures were carried out in accordance with the school schedule.

RESULTS AND DISCUSSION

Food Crops and Horticulture Agribusiness (ATPH) is a vocational field of study in vocational high schools that examines agribusiness in relation to food crops and horticulture. Agribusiness refers to economic activities based on agricultural production or other supporting sectors, both upstream and downstream. The terms “upstream” and “downstream” refer to the fundamental perspective that agribusiness operates within the food supply chain. In other words, agribusiness is an economic approach to the production and supply of food. As an academic subject, agribusiness studies strategies for generating profits by managing aspects of cultivation, raw material supply, post-harvest processing, production processes, and marketing. The term “agribusiness” is derived from the English term “agribusiness,” which is a portmanteau of ‘agriculture’ and “business.” In Indonesian, it is also known by its Anglicized variant, “agrobisnis.” The objects of agribusiness can include plants, animals, or other organisms. Cultivation activities are the core of agribusiness, although an agribusiness company does not necessarily have to carry out these activities itself. If the cultivated products (harvest) are utilized by the manager

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themselves, this activity is called subsistence farming and is the most primitive form of agribusiness. Self-utilization can also mean selling or exchanging to meet daily needs.

Agricultural Business in Food Crops and Horticulture (ATPH) is one of the skill packages at SMK Negeri 1 Trowulan. The ATPH skill package continuously and consistently conducts theoretical and practical learning that creates an enjoyable learning environment, is favored by students, eagerly awaited hour by hour, and leaves a deep impression on all students.

The learning process is designed to encourage communication and interaction, harmonious relationships between educators and students, and a conducive environment for innovation, creativity, and production, ensuring that the desired competencies are effectively achieved. Additionally, it is supported by a cool to warm natural environment, adequate practice areas, and sufficient supporting facilities, all of which contribute to nurturing creative, innovative, productive, and competitive individuals.

This program provides a solid foundation for entering the agribusiness sector. Students are equipped with knowledge and practical skills regarding various types of agribusiness. It is expected that graduates will be able to produce onions, vegetables, fruits, ornamental plants, and others. Additionally, they can also provide guidance and training related to agribusiness.

According to Yulianto (2022), the analysis is as follows: 1) Integrating a number of data obtained from a specific environment. Data obtained from different sources requires further analysis to draw conclusions and gain a more detailed understanding. 2) Setting specific objectives. The function and purpose of this analysis is to make the data obtained more specific and easier to understand. 3) Selecting alternative steps to address the problem and determining the best steps to take to prepare appropriately for the needs. 4) The basic purpose of analysis is to identify data obtained from a specific population in order to draw conclusions. These conclusions will then be used by analysts to establish policies and make decisions to address a problem.

Based on the above definition of analysis, the author concludes that business model development analysis is an issue faced in the empowerment process, whether it comes from internal or external factors. Therefore, sustainable business model development analysis is a challenge or problem still faced by SMKN 1 Trowulan in managing and developing horticultural agriculture to achieve the desired objectives. The development of a horticultural agriculture business model cannot be done without a well-thought-out plan that can address the impacts it will face. Both students and teachers must collaborate in managing horticultural agriculture outcomes to ensure they are sustainable and consistent. Interview results indicate that the limited land available is a factor preventing students from producing horticultural products on a large

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scale. Additionally, students are still in the learning process, requiring them to master the entire process from land preparation, seed planting, irrigation, to production. However, despite these limitations, they cannot be used as an excuse to avoid pursuing sustainable development in horticultural agriculture. The Productive Teacher at ATPH stated that producing on a large scale is still a consideration due to factors such as time, weather, and others. Why choose horticultural crops? Because the planting period is short, allowing for quick crop rotation, so that during their learning process, students can experience the entire cycle from planting to harvest and even market their harvest. The school itself does not require students to produce large quantities; the most important thing is that they understand and master the knowledge so it can be applied in real life, especially if they can start a business in the agricultural field. This was also discussed in interviews with students about the business models they wish to develop in the future after graduating from this agricultural school. One of the objectives of vocational schools is to become entrepreneurs who build thriving and sustainable businesses, benefiting both themselves and others, while also developing agricultural commodities so that farmers are not looked down upon as merely working in the fields under the scorching sun.

Based on interviews conducted with internal school parties consisting of teachers and students, the following business model mapping was obtained

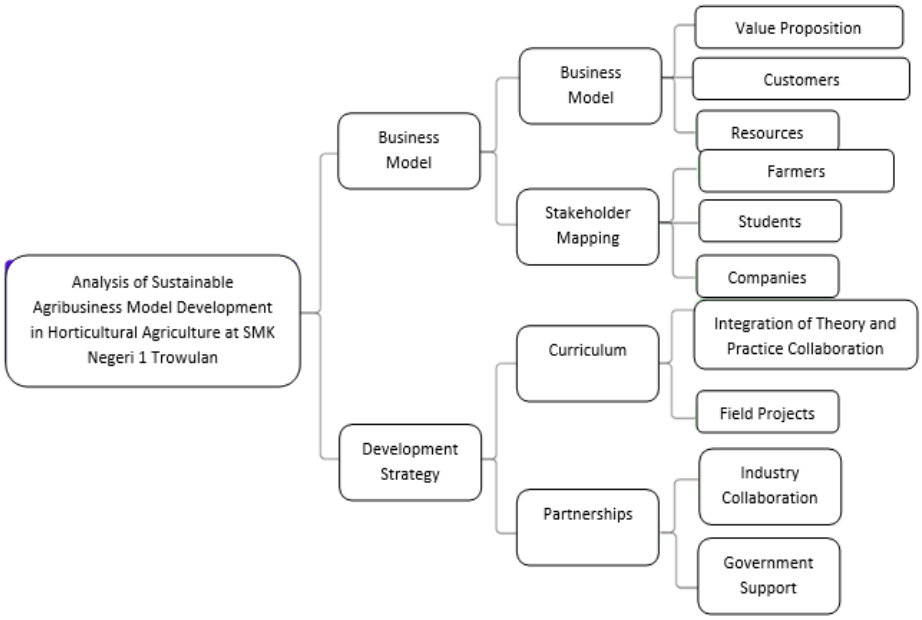


Figure 2. Business Model Mapping

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TEFA is engaged in horticultural cultivation (chili peppers, eggplants, vegetables). Partners play a role in teaching cultivation techniques and analyzing farming operations, providing guidance throughout the entire cultivation process up to marketing. Based on the entrepreneurial experience that the partner has gained over more than 10 years, it is clear that horticultural cultivation requires extra attention, must be given top priority, requires the courage to be different, the presence of true partners, efforts to secure water, learning technology, and the possession of ethics/morals, culture, and land management. Key considerations in land management include seeds, fertilizers, water, labor, time, market, and partners. Culture plays an important role but requires investment in the agricultural sector. The TEFA management process begins with a consensus among students on the type of crops to be cultivated. After discussions with the students, small chili peppers, eggplants, and vegetables like cabbage and lettuce were chosen because they are easier to produce and can be maintained in a short time. Each student receives one plot of land divided into five beds measuring 50 x 300 cm for planting. One of the challenges in cultivating crops on dry land is the limited water supply, so each student is required to water the plants twice a day. All materials provided by the school are stored by the school and managed by the partner. Thus, the partner's role is more focused on guidance and supervision (i.e., teaching, accompanying, and marketing). Meanwhile, the school prepares the students, land, water, seeds, fertilizers, pesticides, and support from all teachers. TEFA has already begun and is in the maintenance phase. There are several challenges faced, including work ethic and discipline among all parties (students and teachers), as well as students' limited understanding of agricultural endeavors, leading them to still view farming as “poor.” Therefore, changing the mindset and character toward farming is crucial before undertaking larger-scale efforts. One alternative to change this mindset and culture is through the family. Therefore, the partner recommends efforts to approach farming to the students' parents. In this way, students will learn to become agricultural researchers (identifying problems and seeking solutions). According to them, the success of TEFA lies in changing the mindset toward entrepreneurship, discipline, and business orientation (increasing income to become a livelihood). This model also has the advantage of producing entrepreneurial graduates, but it requires understanding and commitment from the students' families, where the partner cannot significantly influence parents except through the school committee.

The vocational school development strategy to produce graduates who are absorbed into the workforce implements a tiered system where, in the first year, students' mindsets are changed to focus on agribusiness, learning to farm on a scale where 90% is supervised by teachers and partners and farming on school grounds or land with a population of less than 100 plants. In the

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second year, students must be able to expand their operations to a larger scale with broader land areas and higher plant populations (e.g., a minimum of 1,000 plants) using methods guided by partners, receiving 40% guidance from partners and teachers and 10% from family members. Innovations in agricultural technology begin to emerge, combining technologies from partners and the school with local wisdom-based technologies from families (family traditions). In the third year, students must be willing to manage a larger community land area of at least 1-2 hectares with a population of over 5,000 plants, collaborating with farmers (other community members) based on the region, with guidance from the school and partners at 10% and from the community teaching real-life farmer experiences at 10%.

CONCLUSION

Based on the above study, considering the strengths and weaknesses of the best strategy for developing a student entrepreneurship business model in vocational schools, the Business to Consumer (B2C) model was implemented, which includes students, schools, partners, communities, and families. The implementation begins with students learning agricultural entrepreneurship by utilizing school land on a small scale (first year of study) with guidance from teachers and partners, followed by managing land in their own families on a larger scale (second year of study), and continuing to manage land in the community alongside other farmers (third year of study). Ultimately, after graduating from school (three years), students are ready to start their own businesses. This is the ultimate goal of the Merdeka Belajar, Link & Match program: the absorption of vocational school graduates into the workforce.

Schools can begin developing more practical marketing systems, such as utilizing online platforms and developing commodities on a large scale. Students can start directly engaging in large-scale production development, enabling them to delve deeper into business models for developing entrepreneurship so that upon graduation, they can pursue entrepreneurship in the agricultural sector, particularly in horticultural commodities.

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