

AVOCADOS CROSSING BORDERS: LOGISTICS AND TRANSPORTATION ISSUES IN AVOCADO SUPPLY CHAIN IN SRI LANKA

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ABSTRACT - This study mainly attempts the logistics and transportation issues in avocado supply chain in Sri Lanka. Data collection was done in the main Avocado growing areas; Matale, Kandy, Badulla, Bandarawela and Gampaha Districts in Sri Lanka representing 30% avocado growers and 70% intermediaries. The Sri Lankan Avocado production is mainly relied on home gardening and distinguished by wide varieties in avocado cultivars. According to the result of the study the main logistics and transportation issues were identified as inappropriate harvesting practices, packing, postharvest management, temperature management, inappropriate transportation, and storage conditions. The study suggests reducing the logistics and transportation problems through introducing commercial cultivation and increasing technologies for harvesting, storing, packaging and transportation. Furthermore, the study suggests developing a commercial variety as "Hash" in order to gain entry into the international market. To reduce avocado post-harvest losses, it is suggested to invest into value addition products like avocado oil and researches. Most crucially, the study highlights the necessity for greater government attention on Avocado supply chain development.

Keywords: Avocado; Logistics; Transportation; Supply chain

1. INTRODUCTION

According to the study conducted by Leelananda et al., (2021), It was identified that careless, non-scientific harvesting and handling practices and not having access to a well-coordinated transport system are major contributing factors of postharvest losses in fruits and vegetables industry in Sri Lanka. Since avocados are grown year-round in Sri Lanka, there is a significant opportunity for the country to seize the international marketplace. However, the avocado is a climacteric fruit with a short shelf life and rapid postharvest respiration. Hence, the overall quality of avocado relies heavily on the management of the supply chain, from the orchards to the consumer, including factors, such as packing conditions, transportation, and storage conditions (Bil, et al, 2014). According to a study by Annon (2011), there is no organized marketing process or postharvest handling system for avocados in Sri Lanka and the postharvest losses are occurring mostly during transport and storage, accounting for about 30 % of the total production in the country. There is very little information available and studies conducted on logistics and transportation issues of Avocado supply chain in Sri Lanka and this study mainly intended to investigate postharvest chain of the avocado, identifying the logistics and transportation issues in Avocado supply chain in Sri Lanka and proposing smart postharvest chain management for the Avocado industry in Sri Lanka.

2. MATERIALS AND METHODS

Data collection was done in the main Avocado growing areas; Matale, Kandy, Badulla, Bandarawela and Gampaha Districts in Sri Lanka. From these areas, a total sample of 100 was selected randomly representing the main supply chain actors; farmers (70%), and intermediaries (30%). In-depth interviews with key informants of the avocado value chain, storytelling exercise performed the value chain actors as the methods of data collection. Secondary data were collected by reports of Department of Agriculture Descriptive analysis

was applied for the analysis of data. The study is heavily based on qualitative data and analysis. The avocado supply chain was designed in order to emphasize transportation and logistics issues.

3. RESULTS AND DISCUSSION

The avocado supply chain mainly consists of the growers, collectors, wholesalers, retailers and consumers as indicated in the Figure 1. According to the results of our study, the inefficiency in the supply chain especially during logistics and transportation is attributed as the main problems related to the quality maintenance in avocado industry in Sri Lanka. In Sri Lanka, Avocado faces huge postharvest losses due to inappropriate harvesting practices, packing operations, postharvest treatments, temperature management, inappropriate transportation, and storage conditions. The avocado supply chain in Sri Lanka is shown in the Figure 1.

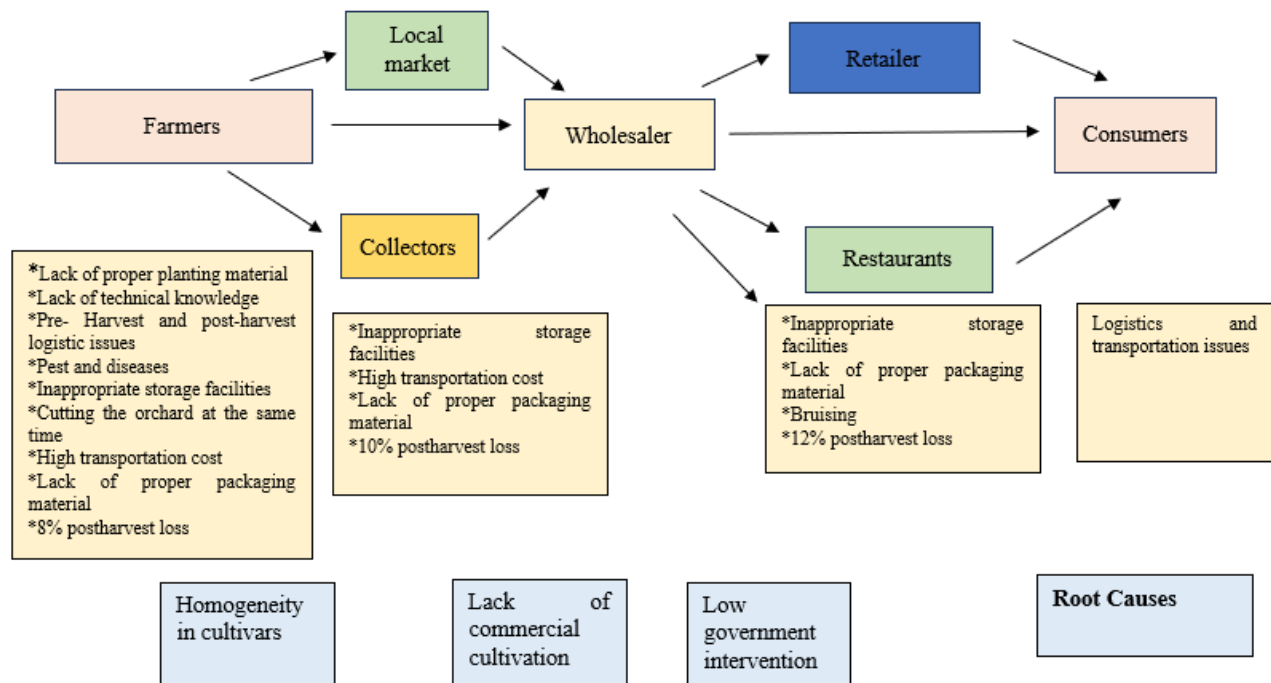


Figure 1: Avocado supply chain in Sri Lanka

3.1. Production and Harvesting Stage

The main issue related to the logistics and transportation in avocado production is mainly due to this high heterogeneity / diversity in the varieties. It makes it difficult to make uniform quality, all complying to a certain standard. According to the study of Coronado (2010) avocado commercialized in the international supply chain has a higher and more uniform quality compared to product sold through the domestic supply chain. It is very difficult to entering in to the global market for Sri Lankan avocados due to this huge variance in the varieties. Though the harvesting fruit at the correct stage of maturity is critically important for the quality, it is challenging to give maturity indexes to the different varieties as well. Avocado has a high economic value; commercial cultivation is very limited in Sri Lanka and the productivity level is also considered at a lower level. Pre harvest and post-harvest management practices are difficult mainly as 92% of the avocados are grown in home gardens. According to the results of our study all the producers and farmers use a bag prepared by a gunny bag to pick the fruits which make some fruits drop down to the floor. Further, trees and fruits are more susceptible to many common pre, and post pest and diseases affected on avocados such as scab, anthracnose and stem end rot, etc. Therefore, all the tree owners stated that it is practically

difficult to handle pests and diseases. According to the results of the study 90% of the collectors are cutting all products in the orchard at the same time, regardless of their size and ripeness. Therefore, there is a huge quality variation in the fruits coming into the market. Therefore, it resulted in a huge post-harvest loss. Considering the pre harvest logistics, there is a huge issue in the technical knowledge dissemination in the avocado cultivation. According to the results, it was identified that farmers and the intermediaries have very poor knowledge in Avocado cultivation and post-harvest handling. The majority of the growers stated the problem is how to obtain the knowledge and skills to produce high quality avocado.

3.2. Post Harvest Handling

Cooling fruit as soon as possible after the harvest will help to maintain quality in Avocado. Considering the storage facilities, none of the producers or collectors use refrigerated room system to store the fruits which cause a huge loss in post-harvest. It is important to move the fruit through the supply chain as soon as possible. 80% of producers and collectors use three-wheelers for transporting the avocado to the marketplace. Due to the economic crisis the transportation cost has become a burden to the collectors and farmers and experiencing delays in transportation. The most crucial point where contact occurs between the logistics system and the product is packaging because it is packed items rather than commodities themselves, that are handled in supply chains. In packaging no proper method is followed by none of the actor and 95% of production is packed by gunny bags which cause for physical damages and bruising of the fruit. Additionally, the product's grading system is absent as a result of the inconsistent quality. As there are different varieties it is difficult to maintain constant quality range, standard boxes cannot use storing the fruits. Furthermore, due to the production of small quantities, the collectors or the producers have to borne huge per unit cost due to the diseconomies of scale. The findings highlight the fact that wholesalers and retailers fail to adhere to suggested handling and storage procedures.

3.3. Processing and value addition issue

Value addition can be considered as one of the best alternative ways to reduce the loss in post-harvest. However, to undertake the value addition also there is a problem in “pulp oxidization”. There is no such technology to solve the issue of pulp oxidization.

4. CONCLUSION

The key issues in transportation and logistics avocado supply chain are due to the heterogeneity in varieties, absence of quality uniformity and absence of commercial cultivation. The study suggests reducing the logistics and transportation problems through introducing commercial cultivation and increasing technologies for harvesting, storing, packaging and transportation and value addition. Since Sri Lanka is blessed with the year around yield the study highlights the importance of the making the government attention to the Avocado industry for more investments on value addition products like Avocado oil and researches.

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