

GOOD TEAS CANNOT BE PRODUCED FROM BADLY HANDLED LEAF: ROLE OF TRANSPORT AND LOGISTICS ON GREEN LEAF SUPPLY CHAIN

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ABSTRACT- The final quality of tea depends basically on the chemical composition of raw tea leaves. Different types of chemical reactions occur in the fresh leaves after harvesting, such as sugar compounds are decomposed with the respiration process and release a high amount of heat and leading to degrade. This study focused to identify quantity and quality loss of green leaf supply chain, find out socio – economic issues of not following standard operating procedures recommended (SOPs) and good practices, lessons learnt from field. This study is based on primary data collected through structured questionnaires, in-depth interviews with key supply chain actors, non-participatory observations of tea lands, collecting centers, various marketplaces, processing factories, export processing firms and institutions of the enabling environment of the agricultural value and supply chains in Badulla, Kandy, Matale, Galle, Matara and Rathnapura districts. The results revealed that the quantity and quality losses of green leaf supply may occur from plucking, bagging, collecting, transportation, bad weather and type of plucker (trained or untrained). During the rush cropping periods post-harvest losses may increase due to the inadequate labor for plucking and operations, Inadequate leaf bags for managing large tea leaf volumes, and inadequate leaf transport facilities and it leads to increase the quality and quantity losses of green leaf supply chain. Inadequate labor is a significant issue in the tea sector, and the failure to follow recommended SOPs results in low-quality tea leaves. Consequently, this leads to marketability issues, low wages, health and safety problems, inadequate sanitation, and poverty etc. This study recommends to maintain good communication and productive relationships among all parties of the supply chain, supplying better technology, value-adding through product upgrading to minimize the economic losses.

Keywords: Green leaf; Supply chain; Transport and logistics; Quality teas

1. INTRODUCTION

Tea is one of the most popular beverages in the world, enjoyed by people of all ages. Harvesting technology is acknowledged to play an important role in defining output, productivity, and quality requirements [1]. The tea may be transported as soon as possible. Shipping tea later may result in quality degradation during transportation [2]. Deteriorating the quality of the tea quality is a concern in a number of tea-producing countries. Due to a labor shortage, the industry would be forced to switch to mechanical tea plucking, which would have a negative impact on the quality of tea produced [3]. Most of the mechanical and improper chemical reactions can occur in the period leaf handling after harvesting, leaves must be transported under great care to the processing place or factory immediately to avoid any crushing damages or other damage [4]. As the malpractices of tea leaves, when transporting the bags or baskets are overfilled with tea leaves and it causes the heat-induced deterioration of fresh tea leaves [5]. Since to produce a quality tea it is important to focused to identify quantity and quality loss of green leaf supply chain, find out socio, economic issues of not following standard operating procedures recommended (SOPs) and good practices, while learning from experiences in the field.

2. MATERIALS AND METHODS

This study is based on primary data collected through structured questionnaires and in-depth interviews with key supply chain actors. Additionally, non-participatory observations were conducted at various locations, including tea lands, collecting centers, marketplaces, processing factories, and export processing firms. The study locations, which include Badulla, Kandy, Matale, Galle, Matara, and Rathnapura districts, were purposely chosen to encompass high-grown, low grown, and mid grown tea regions. Key actors considered were growers, buyers/collectors/agents, wholesalers/exporters, and retailers. The sample size was 30 growers, 18 collectors, 6 wholesalers and 06 exporters who are currently engaged in the tea industry.

3. RESULTS AND DISCUSSION

The quality of the processed tea mainly depends on chemical composition and physical conditions of the fresh tea leaf arrives to the factory. The physical damage may occur at the farm level, transport level and factory level of the post-harvest handling procedure of fresh tea leaf.

At farmer level – Improper harvesting techniques: If tea shoots are stripped from the bush merely by grabbing a clump of shoots rather than by being selective and picking each shoot separately, the succulent leaf is damaged in the hand. Shoots are crushed or bruised when a large number of shoots are collected and retained in each hand for a period, before they are deposited in the plucking basket.

At transport level- During transportation due to usage of the coir sacks, overloading the vehicle, inappropriate condition of the vehicles and improper handling of the gunny bags. Transport and other logistic services of middlemen facilitate to bring the fresh produce to marketplaces.

At factory level – During the heavy cropping ('rush') periods, quality losses are greater owing to the lack of adequate labor for plucking and allied operations, lack of leaf bags for the large volumes of harvested crop, and lack of vehicles for leaf transport.

The stages in which the quantity and quality loss of that take place in the green leaf supply chain is summarized in Table 01. Harvesting, leaf spreading on the ground and leaf filling of bags, and transportation are the most critical operations that are usually possible to quality and quantity losses.

Table 1. Reasons for quantity and quality losses of leaf tea

Stage	Reasons
Harvesting, handling at harvesting	Pest and disease infestation Harvesting fully matured leaves Tea leaf damage caused by rough handling
Spreading and handling of leaf	Air-drying leaves on the ground before loading into vehicles Overfilling gunny bags with tea leaves
Drying, transport and distribution	Insufficient availability of leaf bags to accommodate large harvest volumes Rough handling during transportation
Processing	Inadequate handling practices
Wholesaling, blending & storage	Inadequate storage facilities

Despite possessing knowledge of Standard Operating Procedures (SOPs), the lack of adequate resources, training, and human capital has hindered their adherence to SOPs, consequently leading to the manifestation of various socio-economic issues. Such issues include low-quality tea leaves, low productivity, low wages/working conditions, and marketability issues. Additionally, low levels of education for children, health

& safety risks, violence, inadequate sanitation, and poverty contribute to the challenges they encounter. These factors have discouraged laborers from working in tea estates, and inadequate labor has become a major issue in the tea industry. Laborers on the tea estate live on-site under labor contracts handed down from generation to generation. The collected tea leaves are spread on the bare floor until they are loaded into trucks. However, some tea holders use bags made of cloth to collect the tea leaves, which ensures minimal damage to the tea leaves, as shown in Figure 2.



Figure 1. Leaf damage during transportation



Figure 2. Tea leaves collected at cloth bags

4. CONCLUSION

Quantity and quality losses of fresh tea leaves are higher during transportation. Thus, it is necessary to minimize the losses and improve the cost-effective fresh leaf transport method. For instance, Plastic crates most suitable method for green tea leaf transportation for long distance with less damage and Bulk method is suitable for short distance transportation. Finally, productivity and marketing success of tea value chains should be encouraging by improving tea quality by reaching out to smallholder farmers, reducing poverty and ensure gender equality and establishing and resourcing a national tea research body. Communication among parties in the whole value chain should enhance to create productive relationship for improvement of tea smallholding sector. Supplying better technology would be a good enabler for the minimizing of economic losses. It increases the connectivity among the supply chain partners.

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