Building resilient in cut flower value chains through managing postharvest losses

S.T. Hansika[1*], G.A.H. Galahitigama[2], D.A.M. De Silva[1]

[1]*Department of Agribusiness Management, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka, P.O. Box 02, Belihuloya, Sri Lanka*
[2]*Department of Export Agriculture, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka, Box 02, Belihuloya, Sri Lanka*
hansika.agri.susl@gmail.com

1. Introduction

Floriculture is a global industry, with main markets in Europe, USA, and Japan, and consider as a high income generating agribusiness sector in Sri Lanka (Padmini & Kodagoda, 2010). Demand in both local and the international market has been rapidly increasing since the last few decades in the floriculture sector. However, the floriculture industry in Sri Lanka is still a small and medium category enterprise (Rathnayake & Rathnayake, 2019). Main floricultural products comprise cut flowers, ornamental foliage, aquarium plants, landscaping plants, seeds, and tissue culture plants (Rathnayake & Rathnayake, 2019). Though, export-oriented floriculture industry was established during the 1970 period; still considered as an emerging sector in the Sri Lankan economy (Weeraratne et al., 2012).

Major production regions in Sri Lanka are central, western, and some districts in north-western province. Among these areas, particularly upcountry region is the most appropriate for the cultivation of varieties of cut flowers such as Gerbera (*Gerbera sp.*), Roses (*Rosa sp.*), Madonna (*Lilium candidum*), Chrysanthemum (*Chrysanthemum frutescens*), Aster (*Aster dumosus*), Dhalia (*Dahlia pinnata*), Baby's breath (*Gypsophila* sp.), etc (Padmini & Kodagoda, 2010). The climatic conditions, geographical distribution, labor force, planting inputs provide some favorable impact for floricultural production in Sri Lanka. However, still the floriculture agro-business and export has been limited as the supply chain actors directly influence the total functions floriculture industry (Padmini & Kodagoda, 2010). Therefore, this study was mainly focused on identifying the loss hot spots of the floriculture supply chain and developing postharvest chain management practices to upgrade the current supply chain to achieve an effective and efficient floriculture industry within the country and export market.

2. Materials and Methods

Mixed method approach was principal to investigate the Orchid and Anthurium value chains. Both qualitative and quantitative data were instrumental to identify loss hot spots and develop best practices. Respondents were value chain actors of both Orchid and Anthurium value chain: from grower to consumer.

The selected sample for the study was 55 individuals encompassing all the supply chain actors; growers, collectors, wholesalers, agents, and exporters who are actively involved in the cut flower industry. Data collection was preceded in the Western province (Gampaha and Colombo), Uva (Badulla), Sabaragamuwa (Rathnapura), and North western provinces (Puttalm) where the cut flower industry established. Primary data were collected by focus group discussions in main grower areas, consumer hubs as well as local collectors. Focus group discussions were useful to obtain the overall shape of the value chain, identify key players, opportunities and problems. In-depth interviews with key informants, and interviewer administered questionnaire were facilitated the primary data collection process. Secondary data

were collected from the annual reports of the Export Development Board (EDB), Department of Agriculture, and Department of Census and Statistics Descriptive analysis along with qualitative techniques were instrumental in deriving the outcomes.

3. Results and Discussion

Both Anthurium and Orchid value chains are short with Few nodes horizontally. Upstream of the value chain composed of input suppliers (planting material, fertilizer, agrochemicals, garden tools, equipment, protected agriculture systems, irrigation systems, pots and potting media, etc). Growers (about 95% small holders), local collectors, traders, wholesalers, exporters, importers, retailers and customers. Actor concentration is dense in both ends of the value chain where large number of growers and customers. Countable number of mid chain actors govern the chain. Out of the sample, majority of respondents (46%) were wholesalers and actors were growers (8%), collectors (21%), exporters (17%) and retailers (8%) respectively. Among the growers (20%) have been practiced by-back system and they have made agreements with the companies or individuals regarding buying plants and re-selling operations. Most of the growers considered were independent growers who sell their products at home and sales outlets adopting narrowed marketing methods.

Throughout the value chain, post-harvest losses occurred due to varied reasons and losses recorded as approximately 1-2% for every stage and the total post-harvest losses were 5%-7%. Information asymmetry weakens the relationships among value chain actors. Growers were less aware on end market requirements and ill prepared to cater the need of diversified market segments. In general end market requirement of high quality product with exact color, shape, health and also with shelf life were unmatched and returns were poor for upstream of the value chains. Postharvest losses mainly occur during the transportation where unavailability or limited availability of logistic supplies, and cold chain management were key points. Transportation with improper cool storage facilities, poor road facilities, improper packing has been identified main reasons for reduction of flower quality. Most of the farmers are still far away from the modern techniques such as cool storage and pulsing techniques to minimize the losses and increase the vase life. Grower's literacy on postharvest management of flowers was weak and limited supplies hinder their performance. Unexpected weather and climatic change, pest and diseases problems, pre and post-harvest handling practices worsen the situation.

The majority of cultivators were small scale home growers who have earned profit, by selling in the local market and there were few large growers who engage in export. Although growers have distributed in Badulla, Kurunaegala, Matale, Kandy, Galle and Kaluthara rest of the value chain actors were based on the western province. Therefore growers were unable to supply their products for the specific supplier who valued their products and losses were increased due to poor transportation. Poor returns discourage growers to engage in the business and lead to give up the cultivation. Since they were unable to obtain satisfied income. Higher initial investment, inadequacies of inputs, poor extension, infrastructure support and insufficient marketing avenues were the primary reasons for low productivity in the grower's stage.

Poor communication and coordination among the value chain actors has created the scattered value chain. Hence, it creates shortage of suppliers, considerable post-harvest losses, supply inconsistency, improper price mechanism, and quality deterioration and finally reduces business returns. For the mitigation of the above drawbacks well established value chain network is essential and the each stage of the value chain should be well equipped with the modern technologies and the management practices. Most of the flower exporting firms and some local florists maintain their own farms to produce flowers of required quality as a cost effective strategy since post-harvest losses and the inefficiencies of the value chain. Unment demand of high end local market and export market link with business returns.

Building resilient floriculture value chains require capacity building and empowering the small scale growers along with best practices and postharvest literacy. Smooth information flow from downstream to upstream and establish value chain linkages will help to manage postharvest losses. Build up producer clusters and organization through intervention of the government or private sector companies to increase the skills, knowledge and market access of the grassroots level producers with modern marketing strategies to win the local and export market.
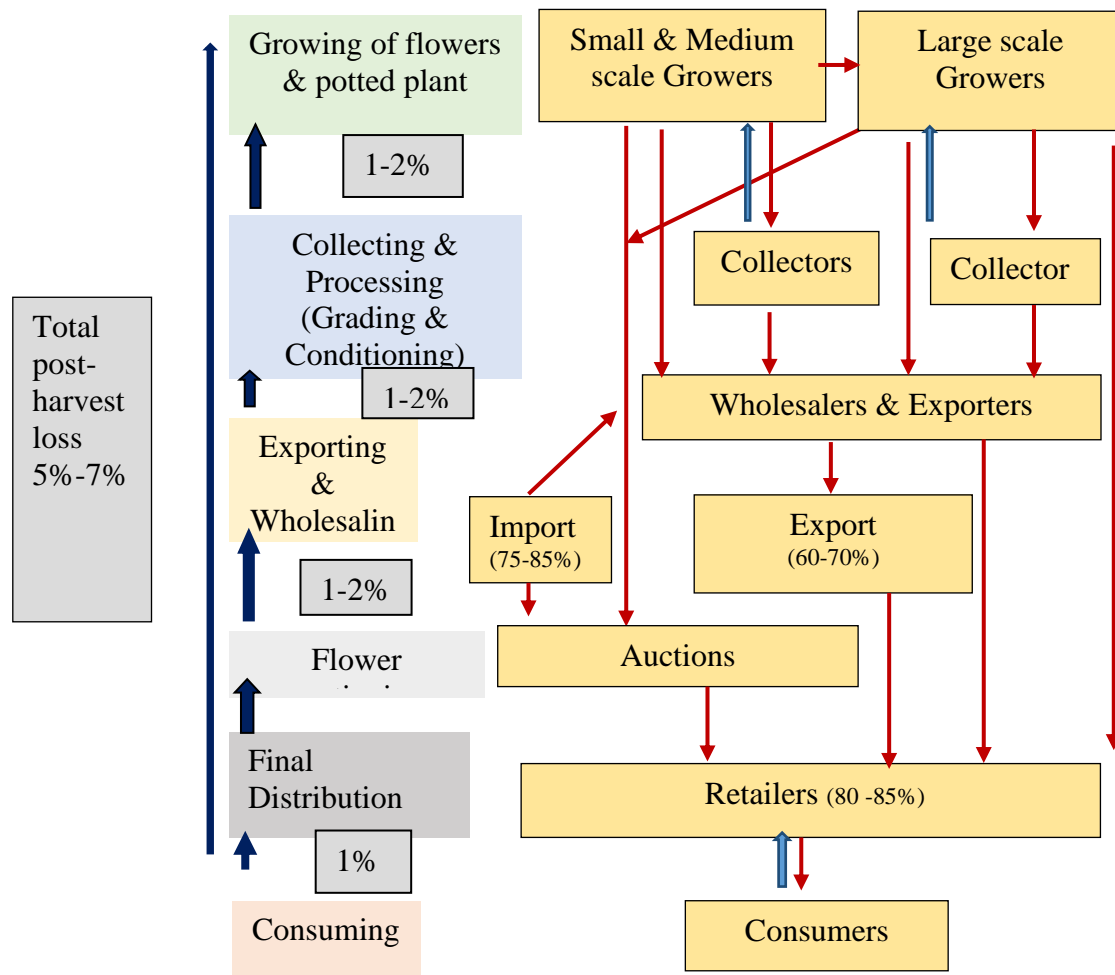

Figure 1. Value chain of orchid and anthurium

4. Conclusions

This end market research investigates the current Orchid and Anthurium value chain; especially referring to identify loss hot spots of post-harvest chain and approaches to minimize losses and maintain quality. Unmet demand of the consumers negatively effect on returns to the value chain members as well as local industry. There's an essential need in building capacity of small holders on quality flower production, postharvest literacy and cater the demands of end users. Therefore introducing techniques such as grading, pulsing, packing using polythene envelops, cool storing, developing of extension and infrastructure, new technology application, policies and legislations will strengthen the each level of the supply chain actors and will be able to explore the new opportunities in the export market.

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