

Wild flower value chains as complex adaptive systems in rural Sri Lanka

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ABSTRACT

Purpose: Timeline of wild flowers showed the changing face to an economic good and moving through the different value chains while fueling to rural livelihoods. Focus of this study was to identify the upstream and downstream actors, their roles, map the wild flower value chain, analyze the income distribution, find out the gender-based constraints and identify the buying behavior of consumers.

Methodology: Rapid market chain analysis equipped to collect the primary data. In-depth interviews with value chains actors, interviewer administered questionnaires and filed observations facilitated the process. Three key economically important wild flower value chains; Lotus, Lily and Jasmine were purposely selected.

Findings: Value chain map shows core processes, flow of products and its volume, knowledge and information, geographical distribution and value web of relationships, and linkages. Income distribution shows that intermediaries claim the lion's loin while collectors and growers receive less. Upstream actors of lotus and lily source their raw materials from common pool and free rider problem hinders the rational allocation of resources. Downstream; retailers govern the chain and seasonal price fluctuations are common. Poor post-harvest chain links with unhealthy returns. Color, price and quality were the prime concerns of consumers. Limitations: Poor availability of literature based on Sri Lankan wild flower sector was a constraint during the study and that was avoided with reference to researches which were done in other countries.

Originality/Value: Since, limited number of studies paid attention on wild flower value chain; it's better to investigate the Sri Lankan wild flower value chain in quantitative and qualitative aspects.

Key Words: Sri Lanka, Value chain, Wild Flower

INTRODUCTION

Cultural and religious traditions led demand on wild flowers. History goes back to thousands of years and flowers were collected from common pool resource bare. Natural reservoirs and man-made ponds, channels and tanks located in dry zones of Sri Lanka are the main production places where resource ownership is with the government and users are the community. Common pool resource belongs to the farming community and access rights were equally distributed among community members. Birth of wild flower value chain dates back to king's era and modern value chains ended up in urban religious places and business ventures. Technological advancements changing consumer preferences, place the demand on

wild flower as raw material and value-added products complete the chain.

Buddhists and Hindus use wild flowers to worship their religious leaders and all religious and cultural activities are decorated with wild flowers. During the king's era people of specific casts were responsible for the supply of flowers to the palace.

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Padmini (2014) noted that during ancient times, wild flowers were used for various cultural traditions and the most evident such uses of wild flowers are found in the frescoes on the Sigiriya Rock. Besides religious purposes, wild flowers were also consumed for medicinal and cosmetic purposes. Ethnic composition (Sinhalese 74.9% ; Tamil 11.1%) positively places demand on wild flowers for traditional events. Other than the cultural and religious events, cosmetics and bridal industry place a good demand on wild flowers. Demand from other areas of the country for various other uses and users derived the pressure on supply side. Birth of commercial flower suppliers and logistic mechanisms on resource use considered the beginning of downstream and value chain.

Wild flower value chains are shorter but complex with many actors and enabling factors. Different geographical destinations have diverse market structures and behaviors. Therefore, performance of each layer needs to be analyzed to assess the overall value chain performance. High post-harvest losses, supply fluctuations, poor quality of wild flowers at the end markets indicate the inefficient wild flower value chain. As a result, most of the vulnerable members of the value chain did not gain benefits as they expected due to the loop holes existing within the value delivery network. As a matter of fact, the consumer prices were comparably high and also middlemen and collectors did not gain the benefits as they expected. Wild flower value chain is very much important because globalization does not only patch up market gaps and brings producers and consumers closer together but also brings regional and international competition into local markets. Few studies were done to identify the position and strategic opportunities for recently emerged hubs in the cut flowers value chain like Kenya, Tanzania, Ethiopia, Nepal (Gebreyesus & Iizuka, 2010; Gebreyesus & Senoble, 2009; Maangi, 2008; Yanai *et al.*, 2007). Wild flowers created employment and income for rural men and women as collectors and growers. Flower marketing strengthens the household economies of the urban retailers and product caters the demands of religious, cultural events as well as the industry. In such cases, a large number of

people competing in local, regional or global markets can benefit from these advantages.

Wild flower value chains serve the economic demands of both rural and urban dwellers and its industrial contribution is very much important to the country's economy. Unfortunately, a limited number of studies were focused on this sector. Present study aims to fulfill this very important need and bridge the knowledge gap. A broad objective was to investigate the three-prominent wild flower; (Lotus, Lily and Jasmine) value chains. Specific objectives were to identify the value chain architecture, its actors, their roles and responsibilities, volume, value and knowledge flows; map the value chains; find out the income distribution pattern along the chains; identify the gender based constraints on actors and activity, and analyze the consumer behavior.

MATERIALS AND METHODS

Figure 01 illustrates the conceptual framework with the variables which we considered in this study. Horizontal links connects wild flower collectors, middlemen and consumers. Service provides and different actors connect each other vertically and the study is focused to identify value chain mechanisms.

Study eyed on 3 wild flower value chains, Lotus (*Nelumbo nucifera*), Lily (*Nymphaea pubescens*) and Jasmine (*Jasminum officinale*); based on its socio-economic importance, cultural and religious impact as well as industrial value. Value chain mapping was focused to map core process, identify main actors, find out flow of products, volume at different levels, flow of knowledge, information, geographical flow, relationships and linkages among the actors, and identify the constraints and recommend strategic interventions. Income distribution analysis was done based on the income per unit, net income at each level, access and control over resources. The gender-based constraints per actor and activity in wild flower value chain were implemented (Agri-ProFocus,2012). Gender involvement in wild flower value chain highlighted the importance of value chain in rural economy.

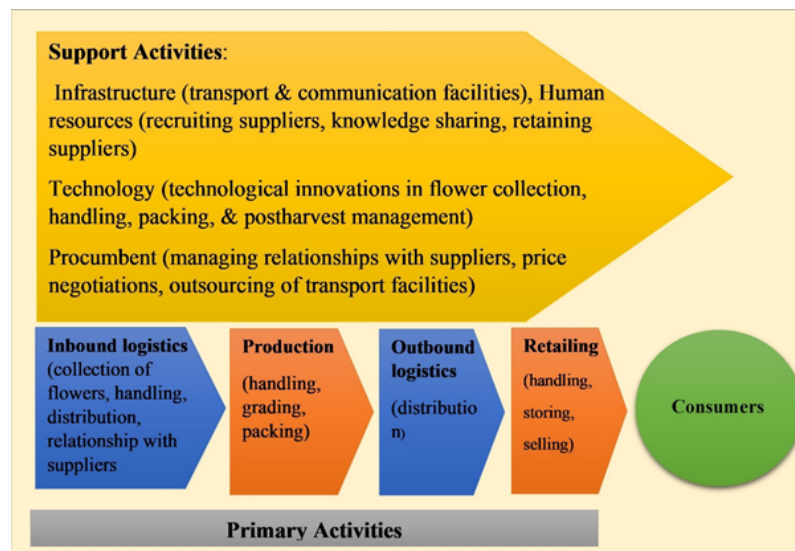


FIGURE 01: Conceptual Framework of the study

Study locations were scattered around the country where upstream actors, wild collectors and growers, were selected from main producing areas. Wild collectors and distributors based on Anuradhapura, Minhinthale, Polonnaruwa, Kurunegala, Matara, Hambantota, Rathnapura, Monaragala were interviewed for lotus and lily value chains and growers of Badulla, Matale, Gampaha, and Chillaw for Jasmine. Snow ball sampling was adopted due to absence of sample frame on producers and sample size was 60. Upstream; processors, value adding companies, exporters, retailers and consumers were identified in Colombo, Kaluthara, Gampaha, Kandy, Rathnapura, Hambantota and Anuradhapura districts. Non-availability of records and data made difficulties in sampling process and purposively selected units were used to gather primary data. Sample profile included 10 value adding companies, 5 exporters, and 100 retailers.

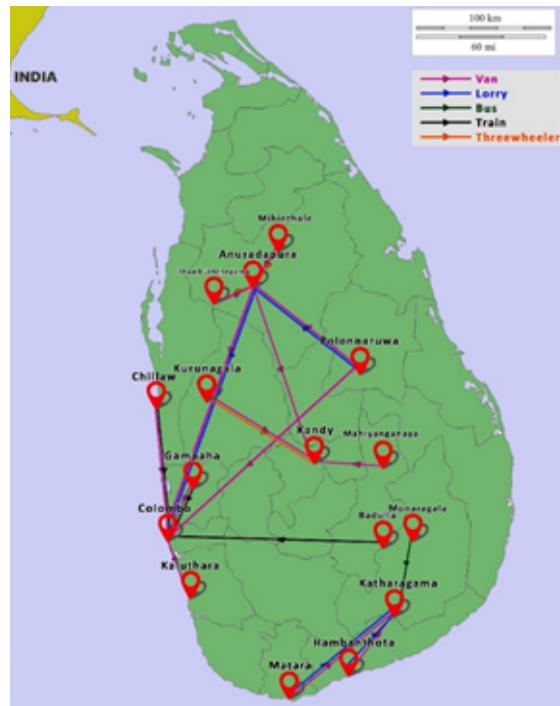
Rapid market chain analysis was equipped to collect the primary data. Structured pre-tested questionnaires, in-depth interviews with key informants of the selected value chains and field observations were main data collection tools. The respondents were various actors who were already engaging in the wild flower value chain including collectors/ growers, distributors and retailers.

A consumer survey was conducted with randomly selected wild flower consumers and the sample (55) composed of religious consumers, users of cultural events including weddings and ceremonies and florists. SPSS (version 22) was used to analyze the data and develop figures.

RESULTS AND DISCUSSION

1. Identify the upstream and downstream actors, their roles and map the wild flower value chain

Study focused on 3 key wild flower value chains; Lotus, Water Lily and Jasmine. Figure 02 explains the core processes, actors, approximate volume of flowers handled, and flow of information and knowledge of the 3 different value chains. Figure 03 shows the geographical distribution and flow of the value chains and the locations all over the country.



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FIGURE 03: Geographical Flow of the value chain members (A: Geographical Locations of each value chain members, B: Main Market Places of Wild Flower Industry, C: Transportation Route Map)

1.1 Upstream actors and their roles:

Majority of the collectors were based on dry zone and the intermediate zone of Sri Lanka (Anuradhapura, Minhinthale, Polonnaruwa, Kurunegala, Matara (Urubokka), Hambanthota, Rathnapura, Monaragala, Kaluthra, Vavuniya). Daily collection composed of 500-2000 flowers per day depending on flower availability and weather conditions. They were using their own boats and tubes for collecting flowers in early morning and late evening and at least 6 to 10 collectors were sharing the harvest of flowers in one reservoir. In general, majority of the collectors and growers were male but in Hambanthota and Thambuthegama (Anuradhapura) female societies who engaged in flower collections were identified. In contrast, flower collectors of southern province were transporting directly to retailers and few engage in direct retailing as well. However, in other areas mainly, collectors engaged only in the flower collecting process. Based on the distributor's information, retailer's demand as

well as with their experiences, they grab the knowledge on present market conditions.

Growers of Jasmine were mainly located in Badulla, Matale, Gampaha and Chillaw areas. Normally, they are plucking 5000-10,000 flowers per day based on availability and seasonal demand. Some of the growers directly transport jasmine by public buses and trains to retailers. Further, growers transport flowers through middlemen/ distributors to urban markets. Distributors were the main market information providers to the growers and collectors. Information on prices, colour and quality were commonly exchanged and mobile phones played a great role in information sharing. Poor condition of transport vehicles and non-use of cooler wagons were the major cause for post-harvest losses.

Individual distributors transport flowers by their own vehicles and common modes are vans, three wheelers and lorries and normally they handle 10,000-25,000 flowers per day. Jasmine

transporters receive flowers from buses and trains to Colombo and from Colombo they transport flowers to religious and other places based on orders. All the distributors gathered information (quantity, flower type, different festival seasons etc.) from retailers and based on that information they decided the mode of transport. In general, retailers handled 10,000-20,000 flowers per day and only interior decorating people managed a cold chain. Majority of flower distributors were male and they acted as intermediaries who linked collectors and growers with retailers.

Downstream actors and their roles:

About 2500 families engage in flower retailing in Sri Lanka and from 10 to 40 flower shops are available near a religious place. They sell wild flowers mainly at religious places in key locations (Kelaniya, Bellanwila, Kaluthra, Katharagama Anuradhapura). Limited value added practices like dehydrated petals, soap, perfumes, essential oil, candles etc. can be seen in the local as well as export market. In value addition sector including extracting essence and dehydrating flower petals female contribution is high compared to male. Retailing functions of Lotus and Water Lily are governed by females while males handle the Jasmine retailing in Hindu Kovils mainly due to their cultural traditions. Other than selling fresh flowers; flower garlands, flowers with sedges plates are also prepared and sold. They gather information with regard to the most preferred way of flower arrangements, quantity, type of flowers etc. mainly from their customers.

However, Sri Lanka is one of the main importers of Jasmine from South India and the volumes change with the seasonal demand. In general, wedding season (May-July) and Buddhists religious festivals (Jasmine Pooja (offering) in Anuradhapura) were the main seasons of demand. Importers bridge seasonal supply gaps and catering to special demands of retailers and consumers.

Wild flower market segmentation is based on its uses and identified main segments were religious consumers, wedding decors, and value adding industries (essential oils). Based on customer’s needs and wants, flow of information and flow of volume is determined in whole value chain.

2. Analysis of the Income Distribution along the value chain

In analysis of the income distribution based on the flower type, location, transportation mode etc. income and expenditure distribution among each member can be differed in the whole value chain. Current rate was the common pricing strategy at farm gate where value pricing was in practice in retailing points. Prices and volume demanded fluctuated heavily in seasons.

The Figure 04 illustrates how the income distribution/ market share takes place among value chain actors and gender involvement for each activity in the industry and their governance.

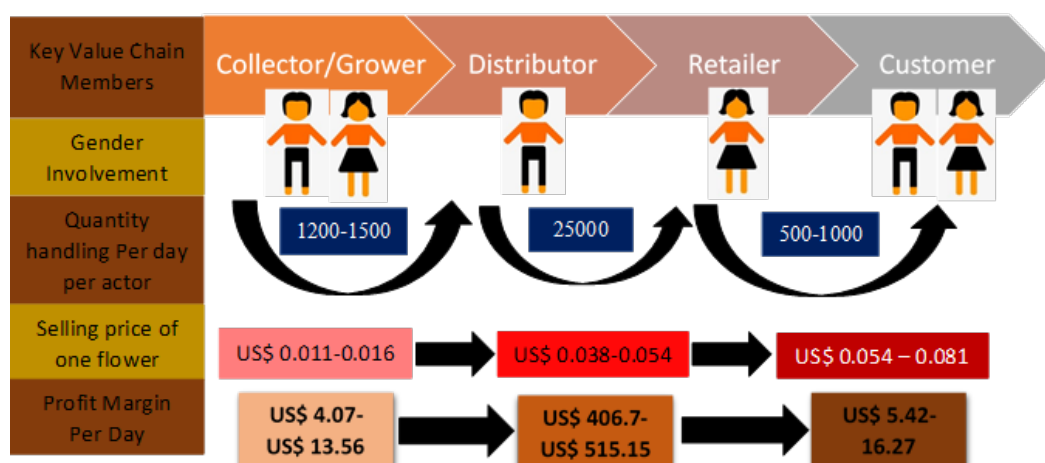


FIGURE 04: Income distribution and gender involvement in wild flower value chain

2.1 Income distribution of collectors:

Wild grown flowers were collected from village based reservoirs, tanks, etc. In general, collectors pay resource rent to the farmer organizations and the value of resource rent depends on availability of flowers. Monthly rent varies between 27.11US\$ - 54.23 US\$. In some areas (Katharagama, Hambanthota) resource rent is charged by fishery organizations as 0.011 US\$ per flower and other areas, they have their own mechanism of sharing natural resources among competing collectors and free rider issues were managed through the informal negotiations among regular collectors. They receive only 0.011US\$-0.017 US\$ from distributors or retailers.

2.2 Income distribution of growers:

Jasmine upstream represents the growers who are using their own resource to cultivate crops as commonly used family labour. They earn 0.011US\$ from distributors and some growers provide flowers for spiritual practices like “*Jasmine flower Pooja*” free of charge. They have to spend expenditure mainly for fertilizer, insecticides like inputs and maintenance costs.

2.3 Income distribution of distributors:

When considering of the distributors, they earn the highest income other than all value chain actors. They receive 0.04US\$ per flower from retailers while buying a flower from collectors only for 0.011US\$-0.017 US\$. Therefore, in average they earn 538.7 US\$ per day after deducting transport costs and all other expenses.

2.4 Income distribution of retailers:

Flower stall owners pay an annual rent, about 162.68 US\$ to the municipal council for their stalls. Cold chain management was rarely practised in retailing points of the value chain and applied only for selected value adding practices, i.e. wedding decorations and processing for essential oils which generate extra income for them. Generally, they receive an income of 54.23 US\$ -108.45US\$ per day. Further, going rate was the common pricing

strategy at farm gate where value pricing is practised in retailing points. Prices and volume demanded fluctuated heavily in seasons such as ‘Katina Pinkam’ (an annual Buddhist religious ceremony) and weddings, etc.

Postharvest practices were poor in all steps of the value chains and high postharvest losses reduce the profit margins of distributors and retailers while collectors, growers and consumers were paying for the losses (200-300 flowers per day from one religious place).

3. The gender-based constraints per actor and activity

All downstream and upstream nodes, male actors were playing the leading role. Majority of the collectors and growers were male as Jasmine value chain was governed by the male actors where female participation was less. User rights were equally distributed among the collectors of resource base, i.e. reservoir or tank and access rights were restricted to community members.

When considering on the growers and collectors, climate and weather changes adversely affected production volumes and quality of flowers; low volume of production, and small size of flowers were common in prolonged dry season and damaged, rotten flowers were a major issue in rainy season and wet weather which ultimately results in a lower income level.

Other than the climate change issue; higher middlemen involvement, less bargain power, higher costs of inputs (growers) are the major constraints faced by upstream actors.

Poor storage facilities and higher post-harvest loss, price fluctuation, Law government involvement and lack of cold chain management, seasonal demand are other major constraints that are faced by downstream members of wild flower value chain.

4. The buying behaviour of consumers

TABLE 01: Consumer buying behaviour of wild flower industry

	Factor	Frequency	Percent
Reason of Buying Flowers	Religious purposes	27	64.3
	Other occasions	9	21.4
	Wedding decorations	6	14.3
Preference on Color	Yes	29	69.0
	No	13	31.0
Preference on other Factors	Color	6	14.3
	Price	20	47.6
	Smell	13	31.0
	Other	3	7.1
Concern on Quality	Yes	31	73.8
	No	11	26.2

Mainly consumers have a seasonal buying behaviour and based on their family background and their attitudes they behave in different ways in purchasing flowers. When focusing on consumer preferences; 64.3% of customers out of respondents buy flowers for religious purposes and 69% for their concern on colour, 47.6% on price and 73.8% on quality of flowers before they purchase.

CONCLUSION

The study has mainly focused on 3 key wild flower value chains, Lotus (*Nelumbo Nucifera*), Lily (*Nymphaea Pubescens*) and Jasmine (*Jasminum officinale*); based on their commercial value in the industry. Value chain map shows the core processes in each node, upstream and downstream actors, flow of products and its volume, knowledge and flow of information, geographical distribution of the value chains and value web of relationships, and linkages among key value chain actors of wild flower industry including growers, collectors, distributors, exporters, importers, retailers and consumers.

Higher amount of income mainly retains in downstream node, especially among middlemen/distributors while collectors and

growers take lower income and also this shows the income distribution differs depending on the location and type of flower. Higher postharvest losses occurred due to poor handling, packing, storing facilities, and unavailability of cold chain facilities. Few value addition companies were seen established locally that exported perfumes, soap, essential oil and dehydrated petals.

Major constraints that all members face are; climate change effects, less government involvement and lack of storage facilities. With the climatic change issue, quality and quantity of flowers are highly affecting and therefore, rapid price fluctuation can be observed in the market.

Consumers of this sector mainly buy flowers for religious purposes other than decoration purposes. Majority of consumers concern on colour of flowers when purchasing and they prefer high quality flowers with low prices. Opportunities for value addition showed the potential empowerment locally and internationally for both male and female actors of the wild flower value chain.

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