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Assessment of the Citrus Value Chain in Bhutan: A Review[1]

Sonam Gyeltshen[1], Garry Griffith[2], Lhap Dorji[3]and Lakey[4]

[1]Renewable Natural Resources Research and Development Centre, Department of Agriculture, Ministry of Agriculture and Forests, Wengkhar, Mongar, Bhutan. Email: sonamg@student.unimelb.edu.au/sgyeltshen2013@gmail.com
[2] Principal Fellow, Faculty of Veterinary and Agricultural Sciences, University of Melbourne, Parkville, VIC, Australia. Email: ggriffith@unimelb.edu.au
[3] Program Director, Renewable Natural Resources Research and Development Centre, Department of Agriculture, Ministry of Agriculture and Forests, Wengkhar, Mongar, Bhutan. Email: lhapdorji@moaf.gov.bt
[4] Coordinator, National Citrus Programme, Horticulture Division, Department of Agriculture, Ministry of Agriculture and Forests, Thimphu, Bhutan. Email: lakeyw@gmail.com

Abstract

The main aim of this paper was to review existing literature on the citrus value chain in Bhutan, identify the current constraints in the value chain and propose strategic interventions for sustainable growth of the value chain.

Bhutan's developmental philosophy is guided by Gross National Happiness. Thus, the Ministry of Agriculture and Forests has always accorded a high priority to agricultural development. The existing literature on the citrus value chain suggests that Bhutanese mandarin has a comparative advantage in terms of seasonality, clean environment and unique taste in the export market.

However, the citrus value chain in Bhutan lacks some of the logistic and cross-functional drivers necessary to ensure high performance. Establishing a value chain forum, strengthening the linkage, increasing the quality and volume of production, positioning the brand image, creating awareness and capacity development, establishing/strengthening the input market, and strengthening the market information system would be valuable interventions to upgrade the citrus value chain in Bhutan.

Keywords: Bhutan, Citrus, Value Chain, Gross National Happiness, and Kingdom

1. Introduction

Bhutan is a small landlocked Himalayan kingdom, sandwiched between China and India – the two powerful countries in the region (Figure 1).Agriculture is the main source of livelihood in Bhutan. Only31%of the population reside in urban areas and the remaining 69% of the population live in rural areas, where the majority of them depend on the integrated use of agricultural, livestock and forestry resources for their livelihood (Ministry of Agriculture and Forests 2009).Bhutan follows a unique developmental model guided by a holistic philosophy – *Gross National Happiness*(Ministry of Agriculture and Forests 2014).To this effect, the Ministry of Agriculture and Forests accords high importance to agricultural development in the country.

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Further, Bhutan has diverse agro-climatic conditions that favour the production of a wide-range of horticultural crops (Joshi & Gurung, 2009). Amongst the citrus types, mandarin orange (Joshi & Gurung, 2009) is the most widely grown in Bhutan (Dorjee, Dukpa, Chhetri, Bockel, & Punjabi, 2007). In Bhutan, citrus is considered not just a commodity but as a source of foreign exchange, livelihood and employment opportunities (Joshi & Gurung, 2009). About 60% of the adult population are dependent on citrus production for their livelihood.

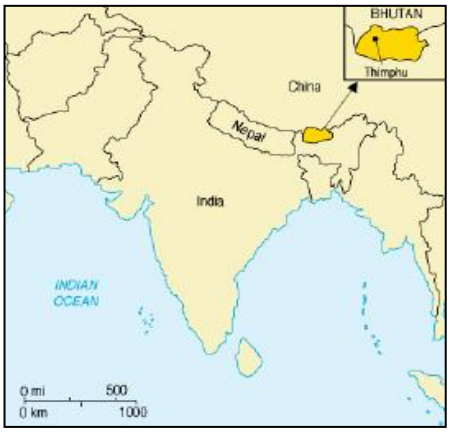


Figure 1: Location of Bhutan

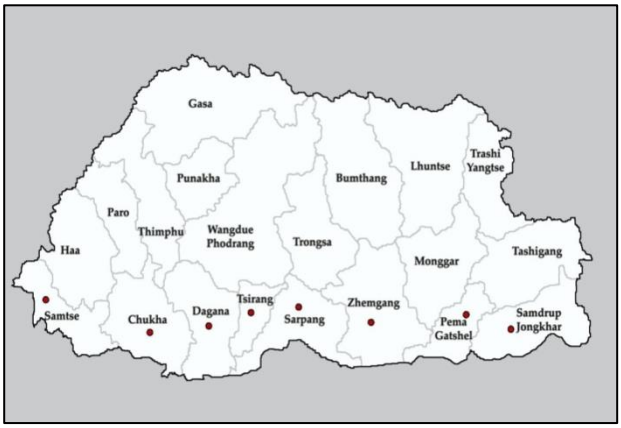


Figure 2: Key mandarin production regions in Bhutan

The main mandarin orange production areas are concentrated in the subtropical foothill areas of the country. The key mandarin growing districts are Dagana, Sarpang, Pemagatshel, Samtse, Tsirang and Chukha (Awais Ahmad Tipu & A. Fantazy, 2014) (indicated with red dots in Figure 2). The total fruit production in 2007 was 72,071 metric tonnes (Dorjee, et al., 2007).

However, the growth of the citrus value chain is hindered by a number of constraints. These include low yield, high cost of production, weak input delivery system, lack of access to, and high cost of, transportation, lack of infrastructure, and weak market information system, jointly significantly affecting the competitiveness of the chain (Dorjee, et al., 2007). In spite of these problems, mandarin orange stands first in export earnings in relation to other horticultural commodities (Joshi & Gurung, 2009; Lindgreen et al., 2008) (Figure 3).

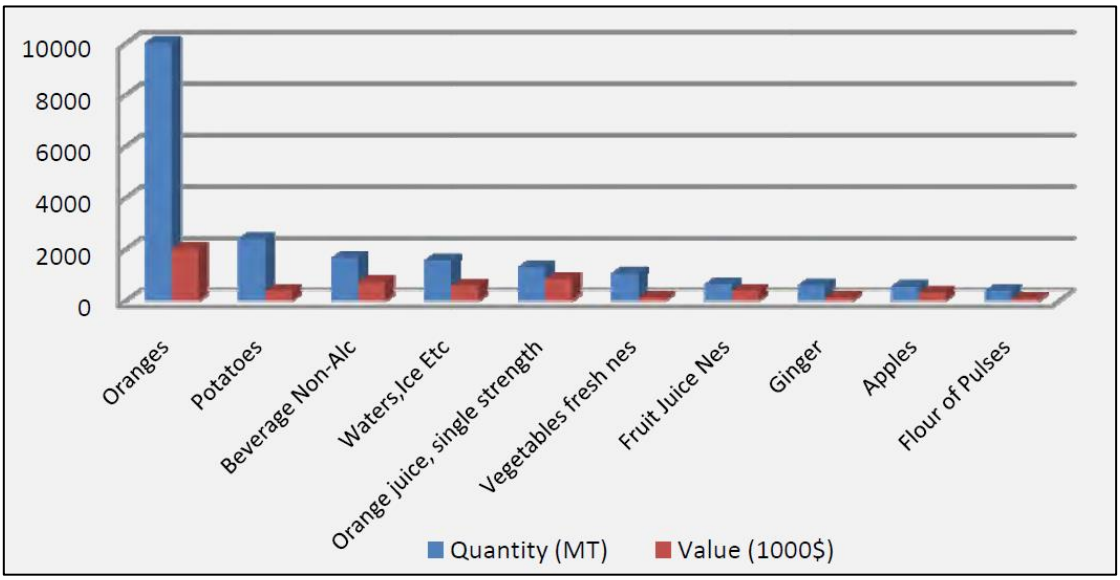


Figure 3: Major export commodities of Bhutan

Source: (Ministry of Agriculture and Forests 2014)

Bhutanese mandarin has a comparative advantage in terms of seasonality, clean environment and unique taste in the export market. Considering the huge benefits that Bhutan gains from mandarin orange, any study aimed at improving the citrus industry would be important, especially, when there is

huge demand for Bhutanese mandarin in India and Bangladesh. In view of this, the main aim of this study is to review literature and analyse the citrus value chain in Bhutan, then identify the constraints in the value chain and propose strategic interventions for sustainable growth of the value chain.

2. Value Chain Mapping

Value chain mapping is a visual illustration of the chain and describes all activities and linkages among the value chain operators and supporters (FIAS, 2007; Joshi & Gurung, 2009). Value chains require comprehensive analysis to describe interacting and competing channels including the farmers (Hellin & Meijer, 2006). As such the value chain map shows the movement of mandarin orange from growers to market, with specific value addition at each stage of the chain (Ministry of Agriculture and Forests, 2014) (Figure 4).

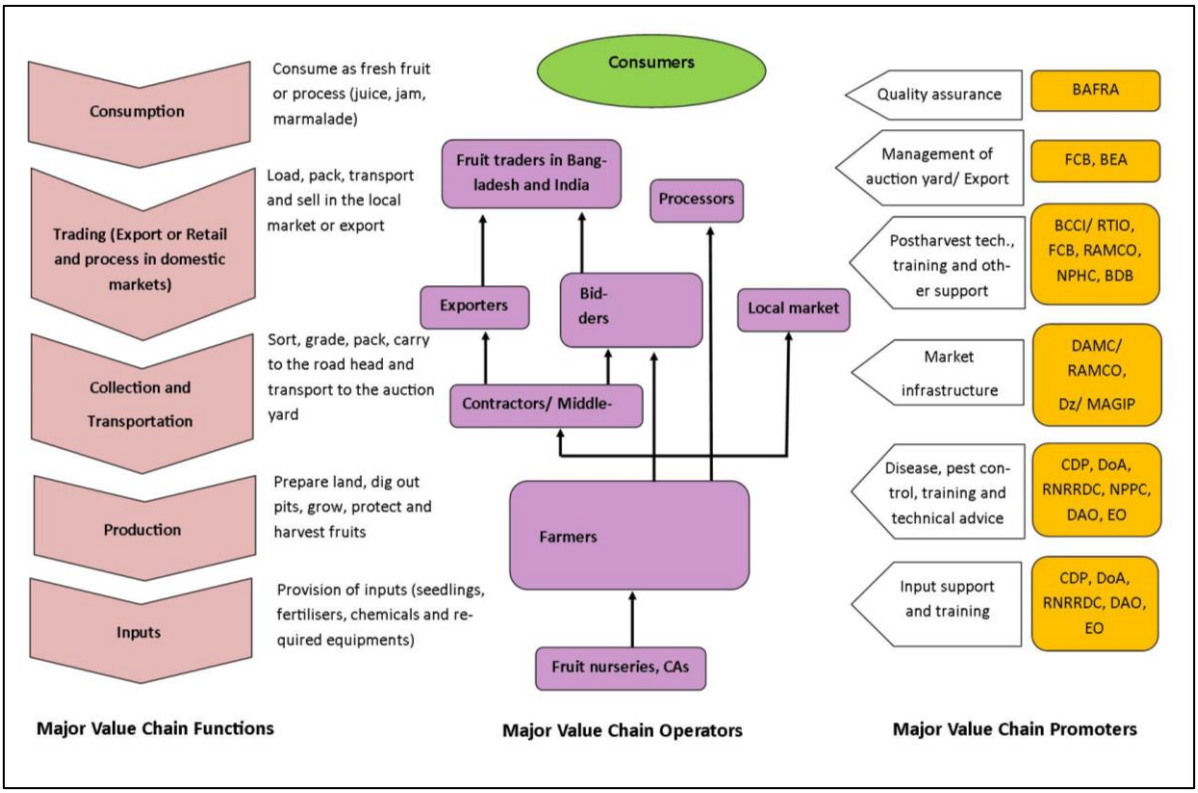


Figure 4: Value Chain Map of Citrus industry in Bhutan

(Source: Joshi and Gurung, 2009)

2.1 Brief description of the value chain

Since the success or failure of any value chain intervention is dependent largely on the partnerships that are built between actors involved in a particular chain (Lundy et al., 2004), it is important to identify the actors and understand their relationships.

2.1.1 Major Value Chain Functions

The major functions of the citrus value chain include inputs, production, collection and transportation of produce, trading, and consumption. Operators carry out the specific functions of the value chain as discussed below (Joshi & Gurung, 2009). However, the nature of the trading function will depend largely on the marketing channel being used. The marketing channel is chosen based on the quality and quantity of produce (Figure 5).

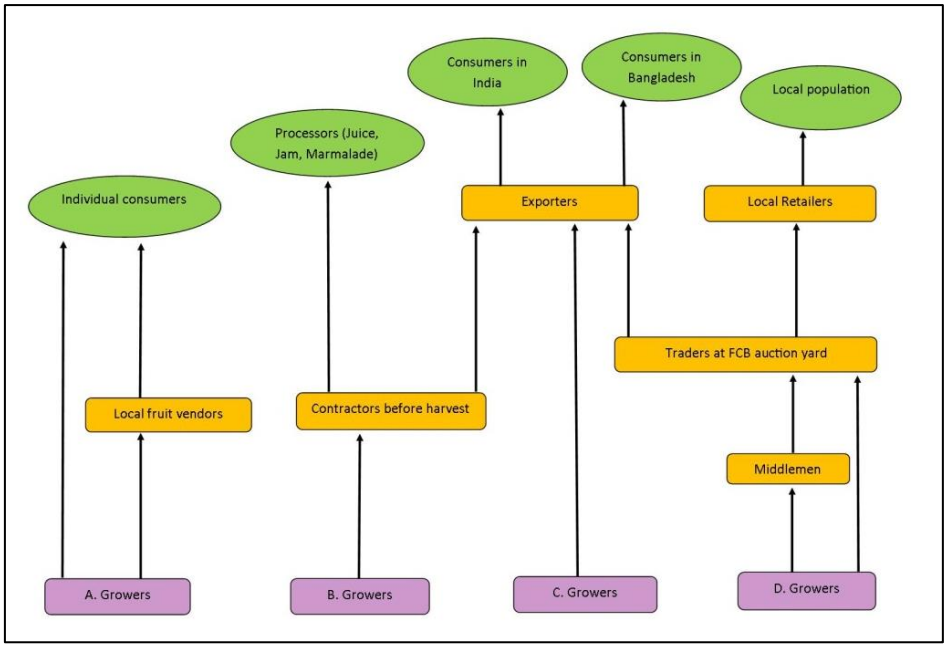


Figure 5: Key marketing channels (Source: Joshi and Gurung, 2009)

2.1.2 Major Value Chain Operators

The major chain operators include input suppliers (National Seed Centre, private nurseries, and commission agents), producers (small, medium and large commercial growers), intermediaries and/or contractors, exporters, traders, processors (Bhutan Agro-Industry Limited (BAIL) and Bhutan Fruit Products Limited), and local retailers. They perform specific roles and responsibilities in the citrus value chain (Joshi & Gurung, 2009). For example, the backyard growers perform most of the production functions by themselves or on a labour sharing basis as compared to large commercial producers, which depend solely on hired labour for most of the production and harvesting functions(Joshi & Gurung, 2009).

2.1.3 Major Value Chain Promoters/ Supporters

The major value chain promoters include government agencies and business associations that provide support services to the citrus value chain in Bhutan. For example, the Department of Agriculture Marketing and Cooperatives (DAMC), Regional Agriculture Marketing and Cooperatives (RAMCO), and Bhutan Agriculture and Food Regulatory Authority (BAFRA) are government agencies, while Bhutan Exporters Association (Beamon, 1999) is a business association supporting citrus value chain besides many other government and private/business entities involved (Table 1).

2.2 Mapping by functions

According to Dorjee at al. (2007), the citrus value chain can be mapped by considering the actors involved and the roles and responsibilities that they perform at each stage of the chain. The actors in the chain include all stakeholders: upstream from input providers to downstream contractors, processors, retailers and exporters, all of which perform specialised functions (Table 1).

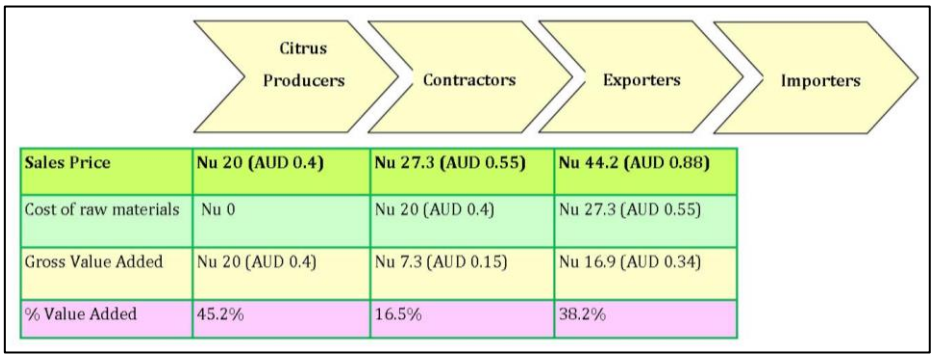
Table 1: Mapping of value chain by functions and actors involved in the chain

Stage of the Chain	Function	Agent	Output
1. **Pre-Production**	- Input supply	DSC, NPPC, AMC, CA, EA	Inputs supplied to farmers
2. **Pre-Production**	- Information supply	Extension Agents, NPPC, NPHC, NSSC, CoRRB	Information disseminated
3. **Production**	- Cultivation - Orchard management	• Backyard farmers • Small orchard owners • Medium orchard owners • Large orchard owners	Oranges
4. **Marketing**	- Advance payment - Harvesting - Transporting	• Direct selling by farmers • Contractors/middlemen/ traders • Exporters	Place value
5. **Exports**	- Export Oranges	• Contractors • Exporters	• Sorting • Grading • Transportation
6. **Processing**	- Process oranges to orange products	• Processors	• Orange Juice • Marmalade • Squash
7. **Marketing**	- Marketing of processed products	• Traders/ wholesalers • Retailers	• Juice • Marmalade • Squash

(Source: Dorjee et al., 2007)

2.3 Mapping by distribution of value addition

According to Joshi and Gurung (2009), the value addition at the producers' level stands at 45.2% of the total value addition as opposed to 16.5% and 38.2% at the contractors' and exporters' levels, respectively (Figure 6).



Sales Price	Nu 20 (AUD 0.4)	Nu 27.3 (AUD 0.55)	Nu 44.2 (AUD 0.88)
Cost of raw materials	Nu 0	Nu 20 (AUD 0.4)	Nu 27.3 (AUD 0.55)
Gross Value Added	Nu 20 (AUD 0.4)	Nu 7.3 (AUD 0.15)	Nu 16.9 (AUD 0.34)
% Value Added	45.2%	16.5%	38.2%

Figure 6: Mapping of citrus value chain by distribution of value addition

(Source: Joshi and Gurung, 2009)

3 Flow Analysis

3.1 Product flow analysis

Like other value chains, most of the value addition such as grading and packaging takes place at producer and contractors or exporter level and the product flows from producers either through

contractors or exporters to the final consumers. Sometimes, producers also sell the produce direct to local retailers and wholesalers (Joshi & Gurung, 2009).

3.2 Information flow analysis

The information flows in reverse direction to the flow of product, from traders or exporters through contractors to the producers. Market information is managed and facilitated by the Department of Agricultural Marketing and Cooperatives. However, the small producers lack the access to market information, thus affecting the product flow. Information includes price, demand-supply situation, security condition, transportation, information on crop management, and pest control measures (Joshi & Gurung, 2009).

3.3 Financial flow analysis

The financial flow is primarily from domestic consumers and exporters back to the producers and farm input suppliers. It can also flow from the contractors, agents and processors to the producers depending upon the particular market channel involved and the volume of purchase. The financial and information flow are vital to fulfilling consumer demand. Therefore, the flow of product, information and financial should be integrated for strategic chain management as they enable tracking orders and fulfilling consumer demands at the shortest time and ensure responsiveness (Chopra & Meindl, 2013).

4. Type of Value Chain Strategy and Strategic Objectives

In order for the citrus value chain to achieve strategic fit, it is important to maintain a balance between responsiveness and efficiency that promotes achievement of the industry's competitive strategy. Similarly, a responsive supply chain should be capable of generating income to its stakeholders by reacting 'quickly' and 'cost effectively' in a competitive environment (Chopra & Meindl, 2013; Gunasekaran, Lai, & Cheng, 2008).

An integrated supply chain strategy is key to achieving strategic objectives (Vickery, Jayaram, Droge, & Calantone, 2003) and thus there is a need to critically examine and integrate the chain drivers (Chopra & Meindl, 2013). Chopra and Meindl (2013) note that strategic objectives can be achieved when value chain capabilities are available to satisfy the needs of the targeted consumer groups (p. 22). Hence, tailored strategies will be critical to maintain balance between responsiveness and efficiency that optimally fulfils the consumers' demands (p. 34).

Thus the performance of the value chain depends on responsiveness and efficiency.

4.1 Drivers of High Performance in the Citrus Value Chain

4.1.1 Logistic and cross-functional drivers

According to Chopra and Meindl (2013), there are several drivers of value chain performance, namely: facilities, inventory, transportation, information, sourcing, and pricing. Based on the mapping of actors and the pro-poor nature of the value chain, both logistic and cross-functional drivers (Figure 7) of value chain performance, as stated above, are important to achieve strategic objectives of the citrus value chain.

Facilities: The facilities form a key driver of 'supply chain performance in terms of responsiveness and efficiency' (Chopra & Meindl, 2013 pp. 45). However, smallholder farmers in Bhutan lack access to facilities and this lack of facilities at production, collection centre and auction yard further deteriorates the quality of the produce and undermines the performance of the chain (Joshi & Gurung, 2009). Therefore, decisions related to facilities impact the supply chain's performance.

Inventory: According to Chopra and Meindl (2013), inventory includes 'all raw materials, work in process, and finished goods within a supply chain' (p. 41) and altering the inventory policies would directly affect the value chain's responsiveness and efficiency. Importantly, high inventory levels for perishable crop would reduce efficiency owing to challenges resulting from inventory management as a result of low shelf-life and expiry (Stanger, Wilding, Yates, & Cotton, 2012). Therefore, inventory management is critical to achieving responsiveness and efficiency.

Transportation: Chopra and Meindl (2013) suggested that transportation enables the value chain to modify the location of its facilities and inventory to strike the appropriate balance of chain responsiveness and efficiency. However, in Bhutan, mandarins are transported in most cases from the road head to the auction yard in ordinary trucks. The lack of an efficient transport system results in huge post-harvest losses that adversely affect value chain performance.

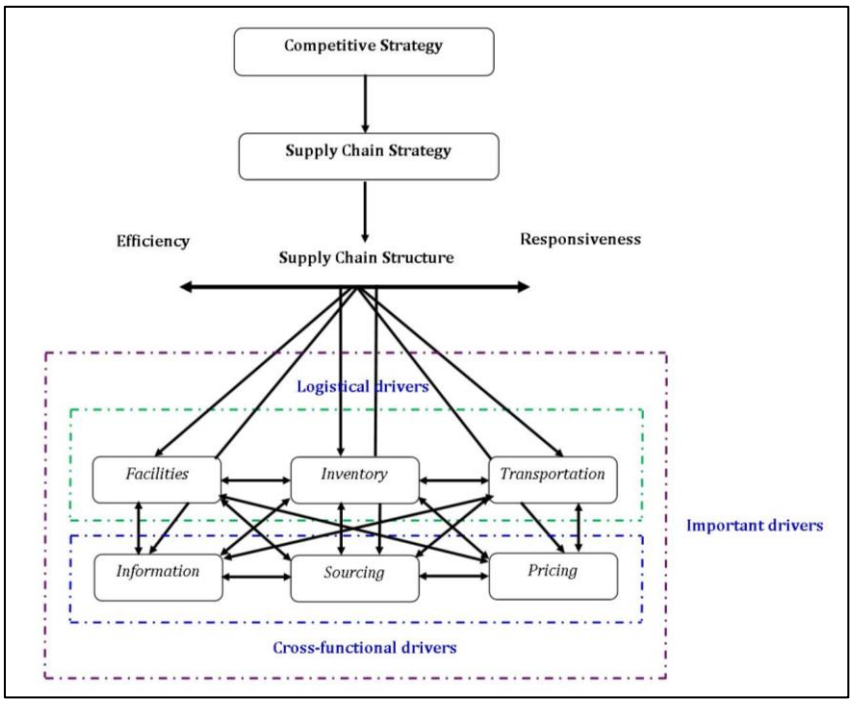


Figure 7: Value Chain Decision Making Framework

(Source: Adapted from Chopra and Meindl, 2013 p. 44)

Information: Information is crucial at all stages of the supply chain for better coordination and linkage (Joshi & Gurung, 2009; Springer-Heinze, 2007). A responsive value chain requires a consistent flow of information across the supply chain (Gunasekaran, et al., 2008). However, poor coordination among the operators is commonly seen as the main impediment to ensuring responsiveness (Springer-Heinze, 2007).

Sourcing: In Bhutan, a majority of citrus producers sell their produce to contractors and exporters, and this deal is made one or two months prior to harvesting of fruits based on quality and crop load. The price also depends on the crop load and quality (Dorjee, et al., 2007; Joshi & Gurung, 2009). The contractor and exporter play a crucial role in the citrus value chain.

Pricing: Pricing refers to how much value chain operators will charge once the fruits are made available in the value chain. Therefore, pricing has a direct impact on the supply chain's performance as it influences buyers' behaviour toward the produce. As such, pricing influences the chain's responsiveness and efficiency.

4.1.2 Policy support

Given the huge economic benefit Bhutan gains from the citrus industry, the government is committed to promoting the pro-poor growth of the citrus value chain in Bhutan. Therefore, policy support will continue to be available for the future growth of the value chain and the expectation is that this support will assist in alleviating poverty in the country (Dorjee, et al., 2007).

4.1.3 Support agencies

The citrus value chain is supported by government agencies and private associations. However, weak coordination and linkage between support agencies is seen as a hindrance to the growth of value chain (Springfield Centre for Business in Development, 2008). Nevertheless, with coordinated support, the value chain will have better access to markets and contribute to competitive advantage (Joshi & Gurung, 2009).

Therefore, the analysis of these drivers suggests an optimistic future and sustainable growth of the value chain into the future.

5 Performance of Citrus Value Chain in Bhutan

5.1 Production Performance

The volume of fruit production and market share are important bases on which to judge performance of the value chain. As such, the prospective mandarin orange production in Bhutan looks optimistic given the suitable agro-climatic conditions. The total mandarin orange production in 2007 was reported to be 72,071 tons with an average yield of 36 kilogram per tree (Figure 8) (DoA, 2007 as cited in Joshi & Gurung, 2009). This had grown from around 30,000 Metric tonnes (MT) in less than a decade.

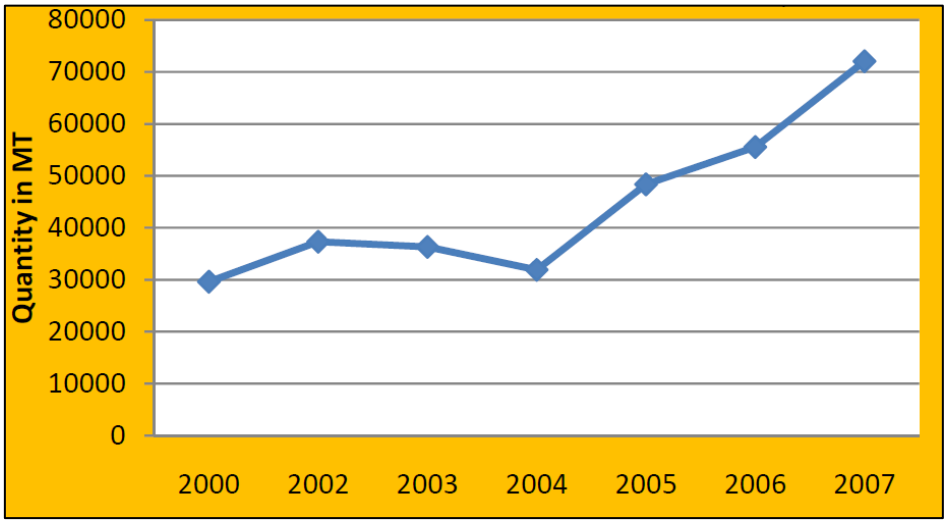


Figure 8: Trend of mandarin orange production in Bhutan

(Source: Agriculture Statistics, MoA, as cited in Joshi and Gurung, 2009)

5.2 Financial Performance

In terms of financial performance of the chain, a study conducted by Dorjee et al. (2007) shows that the profit margin of exporters (with 15% of profit) is higher than that of retailers and contractors. The higher profit margin can be attributed to the higher quantity of citrus fruits they handle and the relatively smaller number of labour units required to move the throughput (Table 2).

Table 2: Financial performance of contractors, exporters and retailers

Economic Analysis of Agents (Traders/Processors)	Contractor middlemen	Exporters	Retailers
	Nu.	Nu.	Nu.
Sales	773,758	16,488,920	53,236
Intermediate inputs	541,395	13,245,919	40,405
Value added	232,363	3,243,001	12,831
Income	*87,878*	*2,593,443*	*12,831*
Hired labor	*144,485*	*570,868*	*0*
Return per MD of family labor	732	12967	214
Economic prod cost/kg	8.81	14.67	10.1

(*Source: Dorjee et al., 2007)*

Likewise, economic analysis of the chain is vital to understanding the wealth creation by different actors in the chain. The gross product of the citrus value chain is around $US22 million (Table 3). Of the total, salaries for the employees account for about 21%, and 59% constitutes income for producers. This clearly indicatesthat the Bhutanese citrus value chain is very labour oriented(Dorjee, et al., 2007). Therefore, interventionswhich improve the income of farmers will assist in improving rural livelihoods. Bhutanese mandarins are in demand in the Bangladesh and Indian markets. For example, in the 2014-15 season alone, more than 25,500 MTof mandarin was exported to Bangladesh and over 8,900MT to India (Ministry of Agriculture and Forests 2015).

Table 3: Economic weight of citrus value chain

	Million Nu	*US$ Million*	% share of value added
Gross product	993	*22.07*	
Added Value	367.8	*8.17*	100
Salaries/Wages	76.7	*1.70*	21
Farmers income	215.4	*4.79*	59
Micro-enterprise income	15.6	*0.35*	4
Exporter	62.9	*1.40*	17
State	2.2	*0.05*	1

(*Source: Dorjee et al., 2007)*

6 Constraints of the Citrus Value Chain

The main constraints affecting the high performance of the citrus value chain are an unreliable market information system, lack of access to, and high cost of, transportation, lack of basic infrastructure (storage, collection centres, grading and packaging facilities), buyers' monopsony power, frequent labour strikes in Indian border towns, inadequate knowledge and skills of growers, weak input or service market, and high pressure from insect-pests and diseases(Joshi & Gurung, 2009, p. 51). These constraints are inter-connected in nature.

6.1 Insect-pests and disease problems

As pointed out by Joshi and Gurung (2009), the low yields of mandarin orange in Bhutan are mainly due to the high pressure of insect-pests and diseases although other interlinked constraints can also contribute. Citrus greening disease and fruit fly are the two major problems which affect citrus production in Bhutan.

6.2 Weak input/ service market

Basic farm inputs and allied services are crucial for optimum citrus production. However, the input and service market are very weak in Bhutan. Joshi and Gurung (2009) and Dorjee et al. (2007) reported that acute shortages of quality seedlings and lack of timely access to other farm inputs such as fertilizers and plant protection chemicals were the main hindrance to optimum production.

6.3 Inadequate knowledge and skills

Insufficient knowledge and skills of farmers pertaining to orchard management are often highlighted as serious constraints in Bhutan. This problem arises due to lack of competency and motivation of Agriculture Extension Officers who are responsible for disseminating the required knowledge and skills to producers (Joshi & Gurung, 2009).

6.4 Lack of access to and high cost of transportation

Given the highly fragmented areas of production coupled with the challenging geographic terrain, lack of access to transport is always cited as one of the main marketing constraints. Moreover, the lack of road connectivity between the villages further adds to the high cost of transportation (Joshi & Gurung, 2009)**.** For instance, to transport a truckload of oranges from Lhuentse district to the nearest auction yard (Samdrupjongkhar) would cost Ngultrum[2] 10, 000 (equivalent to $AU500) (Joshi & Gurung, 2009).

6.5 Postharvest losses

Poor agronomic practices coupled with poor postharvest handling result in high postharvest losses of about 30%(Lophyal, 2009, as cited in Joshi & Gurung, 2009). This is mainly because farmers practice traditional ways of harvesting, which cause extensive damage to fruits thus resulting in substantial losses.

6.6 Lack of proper storage

Lack of basic infrastructure such as proper storage facilities on the farms, collection centres and auction yards also impacts the performance of the value chain negatively. For example, when the contractors and growers have to store oranges at auction yards in the event of strikes in Indian border towns, this results in substantial loss (Joshi & Gurung, 2009).

6.7 Unreliable market information and poor coordination

The majority of farmers do not have reliable access to market information and remain unaware of the prevailing prices until they reach a particular auction yard. The unreliable information along the chain results in poor coordination amongst the actors. Market information includes prevailing prices in the market, cost of transportation, cost of handling, cost of the market, the demand-supply situation, weather conditions in the production areas and fluctuating market environment and strikes in bordering Indian towns that might directly impact accessibility and price in the market (Joshi & Gurung, 2009).

6.8 Inadequate access to credit facilities

Lack of finance is always seen as a constraint to farmers engaged in citrus production. This has hindered the smooth operation of the business, especially for group marketing. Producers at large are unaware of the credit facilities of Bhutan Development Bank. However, some of the contractors and local traders reap the benefits of such facilities (Joshi & Gurung, 2009).

6.9 Buyers' monopsony

It is often believed that buyers at the auction yard form syndicates among themselves with a view of dictating price. As a result, price sometime falls so low that it barely reaches a break-even level. Nevertheless, as citrus is perishable in nature, producers/contractors have no choice than to sell their produce at bidders' mercy (Joshi & Gurung, 2009).

6.10 Frequent strikes in Indian border towns

Frequent strikes in Indian border towns greatly affect the producers, contractors and exporters, especially in Eastern Bhutan. This is because transporting the produce using alternative routes to distant auction yards becomes expensive and decreases the shelf life of fruits(Joshi & Gurung, 2009).

6.11 Low investment in research and extension

Low investment in research and extension development is also seen as one of the factors which inhibit performance. Research is needed to provide a range of varieties that have high production potential, market suitability, tolerance to physical damage caused by transportation and also be resistant to pest and diseases. Many of these attributes would increase the quality of the fruit at the final point of sale, and both reduce the waste and increase the value flowing back through the value chain.

[2] Ngultrum (Nu.) is the official currency of Bhutan, equivalent to Indian Rupee.

7 Possible Interventions

Any proposed interventions should be aimed at addressing the constraints in accordance with the value chain's strengths and weakness as well as opportunities and threats. Joshi and Gurung (2009) argue that intervention should not merely focus on overcoming the weaknesses but, at the same time, exploit the strength and opportunities of the value chain. Further, the interventions proposed should be in line with the value chain growth strategy (Garcia Martinez & Poole, 2004) to improve its competitiveness (Chopra & Meindl, 2013).

Moreover, to achieve the strategic objective, a strong linkage between different public sector agencies and the private sector (business associations) is a pre-requisite for fostering public-private partnerships (Joshi & Gurung, 2009; Springer-Heinze, 2007). Therefore, all actors can benefit from working collectively to upgrade the chain through vertical integration and horizontal collaboration (Figure 9).

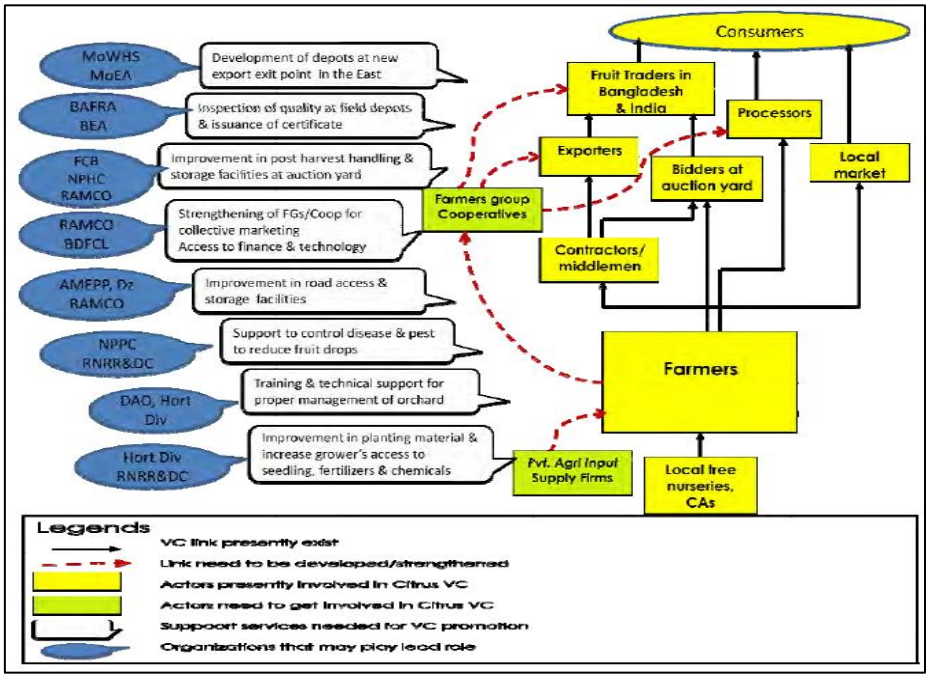


Figure 9: Supporting agencies and required services for value chain upgrading

(Source: Joshi and Gurung, 2009)

7.1 Establishment of a Citrus Value Chain Forum

Establishment of a forum could effectively monitor and facilitate implementation of the interventions and strengthen coordination among the various actors in the chain (Awais Ahmad Tipu & A. Fantazy, 2014; Springer-Heinze, 2007). Such coordinated efforts can help overcome constraints such as production cost and postharvest losses. Accordingly, the roles and responsibilities at each stage of the chain can also be clearly worked out, which will eventually lead to shared understanding, mutual trust and greater collaboration among the actors and ensure the growth of the value chain(Chopra & Meindl, 2013; Joshi & Gurung, 2009; Springer-Heinze, 2007).

7.2 Improvement in quality and production

Fruit quality and volume of production are the two main pre-requisites to ensure that consumers' demands are met and to achieve the competitiveness and efficiency of the chain. As the cited reports and publications point out, it is important to focus on the improvement of planting materials through to the crop management practice and postharvest handling, grading and packaging (Dorjee, et al., 2007; Joshi & Gurung, 2009).

7.3 Develop or strengthen input/ service market

According to Joshi and Gurung (2009), this is a vital intervention which can lead to increased access of producers to basic inputs and related services resulting in increased profits. The concerned government agencies need to review the existing input delivery system ('cash and carry system') and

explore more viable options for better input and service delivery (Table 4) (Joshi & Gurung, 2009). Therefore, strengthening private nurseries would ensure accessibility and timely supply of citrus seedlings to farmers.

Table 4: Strategic areas of intervention and proposed activities for value chain upgrading

Strategic areas of intervention	Particular activities	Expected output
Provision of quality inputs	♦ Develop and promote suitable disease and pest resistant rootstocks and citrus cultivars ♦ Support nurseries to ensure adequate supply of planting materials ♦ Review the current input supply system and strengthen the supply mechanism ♦ Encourage private firms or farmers' groups to function as input supplier ♦ Step up pest monitoring and surveillance system and maintain adequate stock of chemical for emergency purpose	Inputs are readily available and measurable yield increase due to timely use of these inputs.
Step up agriculture extension services	♦ Provide timely technical advisory support ♦ Enhance the technical capacity of extension personnel ♦ Develop a capacity development program and follow-up plan ♦ Encourage producers to follow the recommended management practices of citrus	♦ Producers follow the recommended management practices
Postharvest technology and processing	♦ Enhance capacity of producers on harvesting techniques, packaging, grading and sorting. ♦ Set up small processing units for farmers' groups/ cooperatives in their own locality ♦ Strengthen the processing units in line with public-private partnership (PPP model)	♦ Postharvest losses minimised.
Formation of groups and Cooperatives	♦ Create awareness about working in a group and cooperative model. ♦ Strengthen existing groups and form new cooperatives ♦ Support cooperative development process	♦ Producers have improved bargaining power and traders get assured supply of product from one place.
Marketing and strengthening of value chain linkages	♦ Provide timely market information related to prices, supply-demand situation and destination market condition ♦ Foster close collaboration of all actors through regular meetings, dialogue, joint decision making, and commitment to act on decisions. ♦ Support local traders to participate in an international trade fairs and strengthen their business networks in Bangladesh and other countries	♦ Enhanced linkages among all actors of the value chain resulting in fair distribution of income
Quality assurance policy and favourable business environment	♦ BAFRA to inspect quality and issue certificate at the collection centres (depots) ♦ Promote fair trade and organic market and introduce trademarks once the guidelines are followed by the actors ♦ Free movement of trucks through bordering Indian towns (currently restricted movement)	♦ Favourable government policy for assuring quality and trapping niche market.

(Source: Modified from Joshi and Gurung, 2009)

7.4 Create awareness and capacity development

Awareness among the actors, especially farmers, to use quality seedlings and to follow industry-recommended practices is important. However, many chain operators fail to follow the simple practices that would make huge differences in pricing and minimising losses. In view of this, the focus should be to enhance the capacity of extension personnel and farmers and create awareness on simple practices like postharvest handling, grading and packaging of fruits (Joshi & Gurung, 2009). This would lead to enhanced product diversification and better linkages amongst the actors.

7.5 Improve market information and marketing system

Currently, the Department of Agriculture Marketing and Cooperatives (DAMC),in collaboration with the Food Corporation of Bhutan (FCB),provides the market information related to price and demand supply situation, largely through television, radio and website. However, considering the market dynamics, the information should also contain the backlog of produce at the auction yard, the security situation in the bordering Indian towns and pest incidence and control measures to follow. Additionally, the information can also be disseminated through IVR and farmers' newsletters which can be distributed through Agriculture Extension Officers in the respective locality (Joshi & Gurung, 2009).

7.6 Promotion of clean and safe "Bhutan Brand"

Bhutan is known internationally for its clean environment and rich biodiversity. Taking advantage of the clean image, the citrus value chain should consider developing policy guidelines to certify the products as clean and organic and then introduce trademarks as deemed appropriate once the guidelines are strictly followed by the actors (Table 4) (Joshi & Gurung, 2009).

7.7 Establish and promote farmers' groups/ cooperatives

The Department of Agricultural Marketing and Cooperatives is the sole agency responsible for instituting groups/cooperatives. Nevertheless, other stakeholders are also equally accountable. Promotion of a cooperative development model is the main goal of the ministry. Concerned agencies provide financial incentives to such institutions in order to develop basic marketing infrastructure and to enhance their marketing capacity. This will eventually foster better coordination and collaborative work with a shared vision (Joshi & Gurung, 2009).

7.8 Research and Innovation

Investment in research and innovation to diversify technological options in line with the value chain's processes and strategic goals would help achieve responsiveness and efficiency (Lindgreen et al., 2008).

8 Conclusion

In summary, considering the huge benefits that Bhutan gains from mandarin oranges, any attempt to improve the value chain would be valuable potentially, particularly when the chain enjoys strong demand from export markets. As such the citrus value chain in Bhutan has an optimistic future but may profitably capitalise on brand image (unique taste and clean product). However, the value chain is faced with a range of constraints (as discussed above) which need to be addressed to ensure that strategic objectives (related to responsiveness and efficiency) are met and realise the sustainable growth of the citrus value chain into the future.

The growth strategy of the citrus value chain must be in line with the concepts of competitive supply chain strategy whereby strategic objectives have been accorded high priority in order to achieve competitiveness (Chopra & Meindl, 2013 p. 19) and coordination and linkages have been strengthened as a key to value chain upgrading (Springer-Heinze, 2007 p. 121).

In addition, given the limited and now dated information available on the performance of the citrus value chain in Bhutan, and its importance in the local economy, it warrants detailed study. Future study needs to explore the strategic objectives and performance of the citrus value chain and the barriers to integrating the chain drivers.

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