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Competitiveness of Domestic Vs Imported Producers: A Case of Apple Supply Chain in India

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Abstract

Globalization has provided new opportunities for Indian agriculture. At the same time, domestic markets for many fruits and vegetables have been threatened due to import of quality fruits and vegetables. Apple supply chain is the one which has been impacted and at the domestic level, there are wide variations in apple prices across the country. The existing supply chain of apples in India is very complex and the study reveals that producers' share in consumer rupee is less than fifty percent and post harvest losses are more than 25 percent resulting into inefficiencies down the supply chain. Additionally, after the import of apples from other countries in Indian market, the situation has worsened the conditions of Indian apple producers as they are unable to compete on quality front. Hence, the sustainability of domestic supply chains and also that of the stakeholders is an important issue. An attempt has been made in this study to analyze the impact of imported apples on domestic trade by using both secondary and primary data. An analysis of the value chain reflects that the farmers tend to get better prices from the players who have established their infrastructural facilities. Analysis of various factors affecting the chain reflects that even though apples lend themselves to longer duration of storage (up to 7-10 months under controlled storage conditions – the largest duration for any single crop), varieties grown in India along with orchard management and harvesting practices do not allow for a significant part of the produce to be stored under controlled atmosphere conditions (ideally recommended for apple storage) – even if sale immediately after harvest to meet monetary requirements by farmers is taken into account. The change in consumer life style and preferences demands apples around the year whereas its production is for 4-5 months in India. It has been observed that the inflow of imported apples have registered a growth of about 96 percent during 2006-11. Thus, arrival of imported apples has not had any dampening effect on the level and fluctuations in the domestic apple prices and trade. However, it certainly had an impact on prices and hence impacting the income level of domestic traders and growers due to better quality of imported apples as exhibited by higher shelf-life, uniform size, shape, and color. Based on these c.i.f. prices of imported apples in India, it may be argued that imported apples are quite price-competitive and have the potential to affect domestic apple prices in future. This paper further compares the case of Indian apples with imported apples from different countries by comparing quality, cost and other parameters across the supply chain. The supply chain constraints in case of Indian apples have been identified which make the Indian apples uncompetitive with global markets. Various strategies for the sustainability of domestic supply chain for future have been suggested.

Introduction

It has been observed that consumers prefer to have fruits and vegetables through out the year

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including high value fruits such as imported apples. India has produced apples for many years but per capita availability has not increased much (Sikka, 1986). At present apple yield in India is about 10 tonnes per hectares (NHB, 2011). With the inflow of imported apples, the domestic market has changed drastically with regard to quality and prices which resulted into apple value chain. Hence, the sustainability of domestic supply chains and also that of the stakeholders is an area of concern. An attempt has been made to study the effect of imported apples on domestic trade by using both secondary and primary data. An analysis of the value chain reflects that the farmers tend to get better prices from the players who have established their infrastructural facilities. Therefore, it requires some policy interventions so that our apple industry sustains in this global competition.

Methodology

The study was conducted to identify potential, challenges and devising strategies to enhance the competitiveness of the sector including quality and classification, collection methods, packaging techniques, storage modalities and transportation methods and other infrastructural needs in the value chain and to strengthen the competencies of horticultural enterprises to expand market share at domestic and international level. The analysis rely on the collection of primary data from typical agents of the value chain including producers, traders, exporters and retailers combined with secondary sources such as; official statistical data and previous studies about apple. The study was conducted in three leading apple producing states i.e., Jammu and Kashmir (J&K), Himachal Pradesh (HP) and Uttarakhand (UK) of India which contributes more that 95 percent of total apple production in India After that it was tried to light up the essential points that affect competitiveness by calculating some indicators to clarify the real picture. Based on empirical evidences gathered during course of study, strategies have been suggested to improve the marketing and post-harvest management of apples to counter international threats to protect domestic apples.

Mapping the Value Chain

To understand the relationship of the value chains to the broader market it is important to understand the various actors and their direct/indirect influence on chain performance. The value chain includes a series of activities leading from production to eventual distribution into the market. Decision “diamonds” are used to identify steps in the chain that are further evaluated. Each of these diamonds is numbered breaking the value chain map into logical “process group” or “business units”. Each one of these numbers therefore classifies the activity according to a specific type of task and is structured as detailed in Table 1.

Table 1: Decision Diamonds

Diamond Number	Value Chain Step
1	Input Supply
2	Farm Production
3	Post harvest treatment
4	Logistics
5	Processing
6	Marketing

Apple Production Global Scenario

China is the world's largest apple producer and contributes about 47 per cent of the total apple production in the world followed by USA which contributes only 6 percent of the total world production while India contributes 4 percent. (**Figure 1**). According to the recent study (NHB 2011), India is the third largest producer of apples in the world but more than 25 percent pf the produce is lost during the post harvest handling. With the lowering of trade barriers, India has emerged as an attractive market for cross border apple growers.

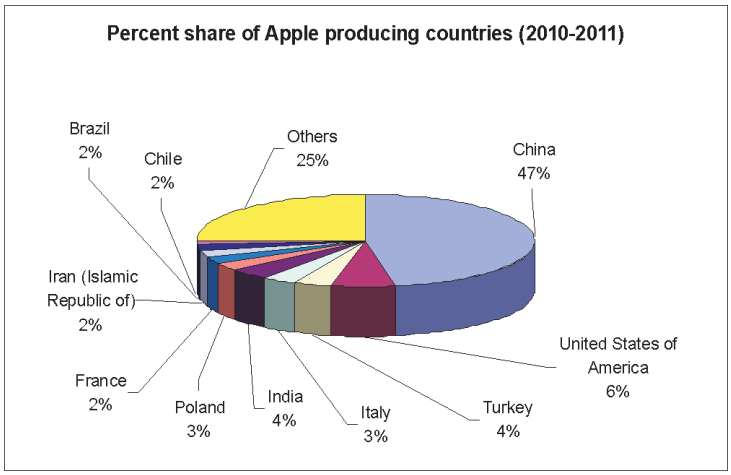

Figure 1: Percent Share of Apple Producing Countries in the Total World Production
Source: FAO Website: March 2012 and for India Data Indian Horticulture Database 2011

Supply and Demand Dynamics

An analysis of the secondary data about the apple production in all the three states validated through field level primary research indicated that the apples will be the prime driver in horticultural interventions in hill states due to 1) its being the single largest crop in the state 2) its being a high value crop apart from lending itself to arbitrage 3) product characteristics lending itself to storage under controlled conditions for longer period – up to 8 months or more 4) other crops- primarily fruits, not providing economies of scale 5) vegetables, including potato – not conducive to longer duration storage due to production in season when not grown in nearby plains- thus resulting in readily available markets and no arbitrage gain due to storage – in fact, in case of vegetables, the arbitrage advantage becomes negative over time, if stored. One of the weaknesses of the supply chain in horticultural crops is of a multi-layered marketing channel lacking in infrastructure and number of intermediaries resulting in lower returns to the farmers and higher market price to the consumers. Another issue in the supply chain is the inefficient post-harvest management. The post harvest losses of fruits and vegetables are estimated to be around 25--40 percent which contribute to higher market prices for consumer but lower return to growers. Improving the post-harvest management including marketing and distribution means an overall improvement in unit productivity as well as higher returns and export potentials including organic produce

The demand for fresh fruit in India, particularly in its urban areas has been increasing at a high rate. The annual per capita fruit consumption was about 30 Kgs.(Sikka,1986) and of this the banana alone accounted for about one-third. This is followed by apple, mango and citrus fruits. On the whole, the consumers spent relatively more on apples. This might be related to various factors, but there certainly a type of diet transition. At an initial stage with the income increase

and higher availability of apples due to improvement in logistics, infrastructure and marketing and retailing. Therefore, apple consumption tends to penetrate most of population market segments. It has been observed that about 60 percent of the total apples produced in HP, UK and J&K are marketed in Delhi market and about six percent in Mumbai market. It may be seen from the **Table 2** that August to November are the peak months for apples. During the visit to these markets it was observed that there is a lot of potential in the markets to absorb the additional supplies. During market survey it was observed that the supply of imported apples has increased in these markets although no published data is available on this account. About a decade ago the apples were available for 5-6 months only and now these are available throughout the year. Thus, there is a great potential in the markets to absorb increased apple production as the traders from nearby areas regularly come to the terminal markets to purchase imported apples also, however, these apple varieties are consumed by high income group. This shows that acceptability of imported apples has been gaining momentum.

Table 2: Monthly Arrival of Apples in Delhi and Mumbai Markets (Percentage to Total)

Market / Month	Delhi	Mumbai
January	5.61	9.74
February	3.33	3.68
March	1.33	3.02
April	0.31	1.78
May	0.07	1.00
June	0.05	1.03
July	3.65	6.23
August	16.14	15.96
September	21.28	15.18
October	20.59	15.10
November	16.76	14.96
December	10.88	12.32
Total	100.0	100.0

Note: 1) Source of arrivals of apples in Delhi during 2010-11 is Agricultural Produce Marketing Committee, Azadpur (Market of National Importance) 2) For Mumbai it was worked out with discussions with traders and officials in the market.

Imports

Imported fruits have made successful inroads into the Indian markets in 2000 and are well accepted by Indian consumers. India's import of fresh fruits in the year 2009-10 was valued at $272.9 million an increase of about 34 per cent during this period. The peak season for imported apples is normally January-July as fresh domestic apples are not produced during this period. Increasing disposable income, interest in premium food categories and increasing health awareness has seen the imported food market in India. Imported apples, particularly Washington apples have been coming to India for over 10 years, and their major market is in the South where the Kashmir and Shimla apples don't have sufficient penetration due to logistical challenges. There are about 7500 varieties of apples worldwide(Kanwar,1987), but the most popular are Red Delicious, Gala, Fuji, Golden Delicious, Granny Smith, Braeburn, Honey Crisp, Cripps and Cameo. But in India Delicious Strains are mostly grown. China and the US are major exporters of fruits

to India and in the last five years, the US has led with apples and pears. However, apples dominate the imported fruit market in India with a giant share of about 60 per cent, followed by oranges, grapes and pears. In the year 2009-10 India imported 99,000 tonnes of apples valued at $91.8 million". The US and China have 42 percent each of the imported apple market share in India.

Distribution Channels for Imported Apples

It has been observed that the availability of apples is practically througout the year. In off season the supply of apples is either from cold storage or from international markets. India is considered to be a big market as far as apples are concerned. There is a specific clientage for imported apples in India particularly in metros and is posing threat to Indian apple industry. Imported apples arrive mostly at the ports of Mumbai and Chennai. More than fifty per cent of the imported apples arrive in cartons packaging of 20 kg at the Mumbai port, followed by Chennai port. Number of cartons per pallet varies from 49-56 depending on heavy to tray packaging. Transportation of apples are through Ocean Vessel in 20 ft / 40 ft dry containers to India. Immediately on the arrival of the consignment in the containers at the designated port, the standard formalities need to be completed (about 7–10 days) before they are cleared for further transportation. Managing the transportation and logistics has become increasingly strategic and complex for the importers and distributors. Container handling and cold storage facilities are available at all major ports. After completing the required formalities at the port, the importer transports the cartons to a cold storage facility. Distributors or wholesalers then transport the apples from the cold storage to markets using by road transport in ordinary or refrigerated vans/trucks depending on distance and time required. The following channel of distribution which is common in imported apples are given in **Figure 2**

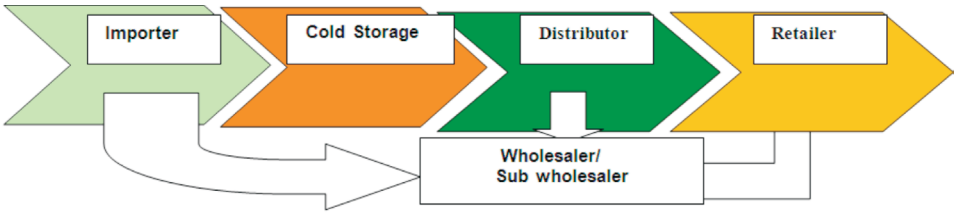

Figure 2: Distribution Channels for Imported Apples

Duties and Tariffs

India, traditionally has maintained high tariffs and import restrictions on food items. **Table 3** reveals the mark up of tariffs in working out the price structure of imported apples. It may be seen that purchase price of one kg of apple at US$ will cost US$ 3.25 to the consumers in Indian markets after calculating landed cost, handling charges and margins of intermediaries.

Table 3: Pricing Structure for Imported Apples

Particulars	Apples(US$ per kg)
CIF (Cost Insurance and Freight) value at Indian Port	1.00
+ Total customs duty on CIF	52.015%
+ handling & clearing charges ,margins of agent etc.	0.44
Landed cost	1.96
Distribution Costs* (logistic cost, margins of intermediaries and their expenses, etc.)	1.29
Retail price to consumers	3.25

Note: * Margins of distributor, wholesalers & retailers = 40–50% for consumer price of apples.

Some of the direct costs that an importer incurs while transferring products to retail outlets include 1) handling charges (assembling, loading & unloading), 2) local transportation costs from the port to the warehouse, 3) storage cost; 4) distribution costs (transport from the warehouse to other cities). Apart from these four duties, additional levies such as anti-dumping duties and safeguard duties may also be applied. It may be noted that at present additional duty of customs and special additional duty are nil for most food products.

Distribution Cost: Imported vs Domestic

The local distribution cost for imported apples of Washington variety of US origin in Delhi market has been worked out in details in this study. It may be seen from the Table 3 that the CIF was Rs.1480.61 per carton of 20 kg and the consumers paid Rs. 2666.54 i.e. apples were sold in Delhi for Rs.133.33 per kilogram. The higher prices may be due to levy of 52.015 percent of import duty and other taxes, very high margins by intermediaries and logistic cost (Deodhar, 2005). Of the consumer rupee spent on US apples in Delhi, the total trader margin in the supply chain amounts to about 51 percent, which also includes an eight percent share for the importer. While the retailer share is about 23 percent The 52.015 percent customs duty on imports amounts to only 13 percent in the final consumer rupee. Whatever value addition is done to the apples in terms of waxing, grading, better packaging, traceability (& ocean shipping) is already included in the import unit values. Washington and Fiji apples are likely to be costlier due to the falling rupee, already prices of imported fruits are 20 to 30 percent higher than local ones. To assess the prevailing local distribution cost, we focused our attention on Himachal apples being sold in Delhi market during harvesting season 2010 for which retail price and wholesale price in Delhi were available. The retail price of Indian apples in the month of October 2010 was Rs. 57.23 per kilogram in Delhi, which amounts to Rs.1144 per 20 kilogram box. The farmer's share in the consumer rupee was about 56.61 percent. During the course of the study it was also observed that transportation cost between Mumbai and Delhi by a 10 tonne refrigerated container is about Rs.40,000. The marketing cost (in percent) and margins of imported vs domestic apples are depicted in **Figure 3a&b.**

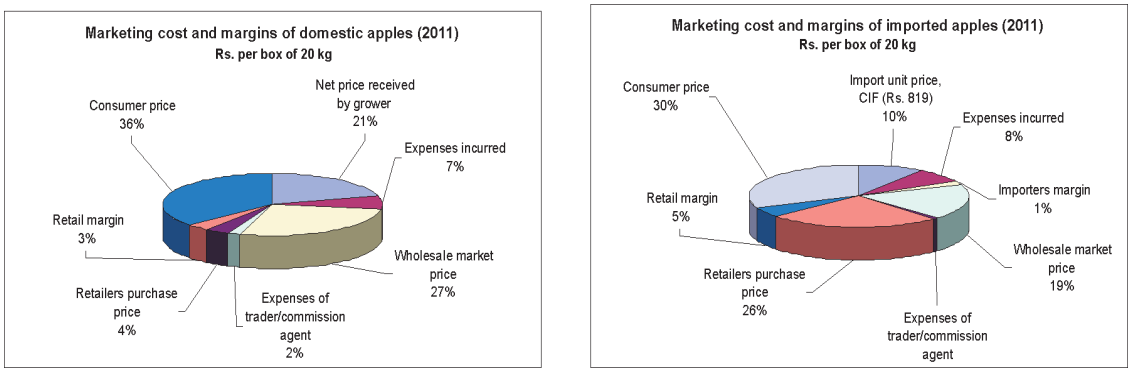

Figure 3a & b: Marketing Cost and Margin of Domestic vs Imported Apples

Note: 1. Sourced from DGCIS.

2. Observed market price of US apples in Delhi, May,2011

3. Calculations based on field visit information, import unit values i.e. US$= Rs.45.50 at the time of survey, and retail prices of imported US apples in Delhi

Present Domestic Apple Marketing System

Marketing system is a chain of personnel integrated with various functions performed by such

intermediaries in order to transfer the produce from the producer to the ultimate consumer. An efficient marketing system, as the farmer visualizes, is one which maximizes his net returns from a given transaction and helps in expanding the market for that product. The product has to be prepared especially for market in respect of grading, packing, etc. The preparation of apples for market involves picking, grading, packing, transportation, etc. As all these functions are important determinants of prices, which the apples will fetch in market, great care has to be ensured at every step. Any carelessness or neglect at any stage in the marketing channel will result in lower prices and hence would miss the target of higher net returns. The apples are separated into six grades and are packed in corrugated boxes with tray of five layers in HP. But in Uttarakhand wooden boxes are very common. Standard box of apple contains 20 kgs. of fruits but farmers are over packing by putting one more layer in CFB boxes to attract more prices in the market(Swarup&Sikka,1987). By doing this they are harming more to themselves by this practice which results in more damage and losses to fruit during transportation. Existing Problems in Indian Apple Supply Chains is listed in the **Table 4.**

Table 4: Existing Problems in Indian Apple Supply Chains

Grading	• Short of skilled labour • High wages • Number of availability of labour • Packaging and grading houses are located at far off places • Higher charges • No confidence – fear of mixing of lots
Packaging Material	• Shortage of boxes/cartons/trays • Not available in time • High prices • Not available on credit • Not available at desired places • Carton boxes need extra care during handling • Cartons containing more quantity than standard boxes of 18 kgs.
Handling and Transportation	• Shortage of vehicles • Non- availability of vehicles in time • Villages are not linked with metal roads • High transportation charges • Non-availability of all weather roads • Excessive time consumed in transportation of boxes on human/animal's back
Malpractices by Traders	• Deduct charges higher than due • Multiplicity of charges • No transparency in charges • Do not take prior consent of farmers before selling • Show lower prices than actually due • Make part- payments amounting to delay tactics
Market Information	• Available for limited markets only • Late information • Inadequate information • Misleading information
Utilization of Culled Apples	• Prices offered are low • Prices are not announced in time • Do not give announced prices • Payments of culled are not given in time • Culled apples are sold in gunn y bags in market for table purposes which lowers the price of good apples
Storage	• No storage facility available • Provision of cool chains not available • Higher charges of storing

Impact of Imported Apples

India started importing apples since the beginning of this millennium year 2000, and the imports are the tune of about 99000 tonnes during 2011 and bulk of these most of the imported apples

arrive in the Mumbai port throughout the year. These apples are redistributed to various consuming markets of the country. The price movements in Mumbai market affect prices in other consuming markets of India whereas price movement of domestic apples in Delhi affects other markets. However, it has been observed during the course of study that imported apples fetch a higher price because of its quality, uniform grading and freshness. In fact, the quality of imported apples is much better compared to the domestic ones except during the Indian harvest season. The retail prices of domestic and imported apples in consuming markets of imported apples is expensive because of 1) the high income consumers prefer to have imported apples, 2) the customs duty charged on the border price of imported apples is 50 per cent, and, the domestic marketing margins on imported apples are extremely high,3) trader margins on imported apples moving from Mumbai port to other markets are high,4) per unit higher transportation cost (refrigerated container shipment from Mumbai port to other consuming markets) and 5) higher trade risk. It is encouraging to note that entry into Indian markets has pushed the prices up and margins of intermediaries are in control and the stakeholders of domestic apples have adopted good management practices including creation of post harvest infrastructure to be competitive in the market (Madras Consultancy Group, Chennai 2009). Thus, arrival of imported apples has not had any dampening effect on the level and fluctuations in the domestic apple prices. It certainly has had a demonstration effect on domestic traders and growers in showcasing higher shelf-life, uniform size and grades, shape, and colour of the imported apples. It is heartening to learn that the imported apples have made the domestic apples more competitive as the growers have putting more emphasis on quality, grading and packaging which has resulted in higher returns to them.

Emerging Needs/Strategies to Counter International Threats

The role of middleman cannot be eliminated altogether. However, the need for improvement in problems/practices in the whole process of supply chain is important for eradicating the drawbacks and the bottlenecks. For this, the introduction of new procedure, adequate infrastructure, organization of new enterprises, checking of illegal/malpractices will come a long way in the development of a healthy marketing system. An initiative in this is, therefore, must otherwise the very purpose of improvement in production system of apple in hills where the market surplus is more than 80 per cent. Keeping in view the problems of apple industry in these states and likely future production the following strategies required for an efficient marketing system have been suggested to improve the growth and development of this vital sector.

- Efficient end to end logistics
- Controlled Atmosphere / Cold Storage
- Cold Storage at retail points
- Perishable inventory handling capabilities
- Ability to handle large volumes across different types of products
- Transparency in the markets
- Quality planting materials

It is further suggested that the market information should be analyzed properly by the experts and made available timely. An integrated approach i.e. integrating the complete gamut of activities along the 'farm to plate' chain has to be undertaken for a any meaningful and viable cold chain development so that the freshness as well as shelf life may be enhanced to compete with imported apples. The suggested model for value chain in apples is depicted in **Figure 4.**

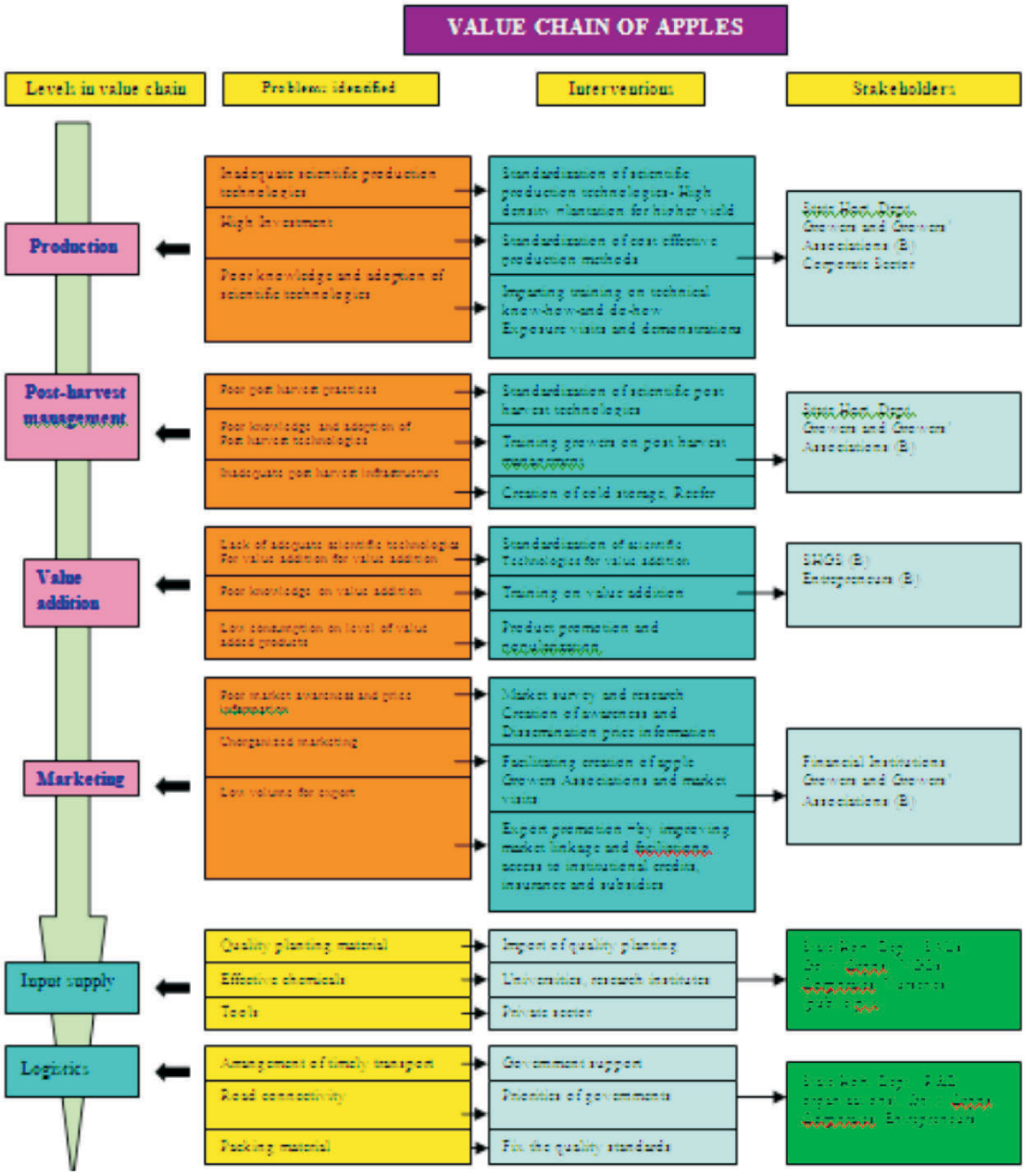

Figure 4: Suggested Model for Value Chain in Apples

Conclusions

It may be concluded that the arrival of imported apples has not had any dampening effect on the level and fluctuations in the domestic apple prices. It certainly has had a demonstration effect on domestic traders and growers in showcasing higher shelf-life, uniform size and grades, shape, and color of the imported apples. It is heartening to learn that the imported apples have made the domestic apples more competitive as the growers have put in more emphasis on quality, grading and packaging which has resulted in higher returns to them. among the imported

apples in India Fuji apple from China and Red Delicious from Washington (USA) are the most popular and preferred varieties by the Indian consumers. The study clearly indicates that there are lot of opportunities to improve the value chain of domestic produce to compete globally which includes three broad categories i.e, production, supply chain management and marketing.

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