Chapter - 6

Problems and Prospects of Solanaceous Vegetables
A majority of the vegetable farmers are small-scale cultivators in almost all the agro-climatic zones of the country. Globalization, WTO and the emergence of supermarkets are enforcing stringent demands on vegetable growers and processors in India. It is important for us to assist our small-scale farmers to meet these demands. Although, due to the advanced agro-techniques development, improved transportation and increased agricultural productivity, the Indian economy is booming. However, in spite of this progress, poverty and hunger are still widespread. In addition to attracting foreign direct investment to promote manufacturing exports, it is equally important in our agrarian-based country to promote the production and export of value-added agricultural products such as vegetables.

The agriculture sector is changing throughout the world. Cereal farmers are adding vegetables to their crop rotations in response to increased consumer demands. Assuming a 3.5 and 5.5 per cent GDP growth rate in India, the projected demand for vegetables in the year 2030 for India alone is 151 and 193 million tonnes, respectively. Without increasing the area to achieve the target, the yield increase should be 190 to 200 per cent.

India ranked second with production of 125887 thousand tones from an area of 7803 ha with a productivity of 16.1 t/ha contributing 13 percent of the total vegetable production in the world. Since India
grows a tremendous number of diverse vegetables, there is a large scope to export many more vegetables to countries within and outside the region.

The real problem in the marketing of perishables was not that of the differences in prices in two secondary markets or a secondary and a terminal market but at the producers and the wholesalers’ level in the secondary market. It was found that in Bangalore, during month of May-June, the price received by tomato producer was less than the 25 per cent of the price received by the wholesaler in the Bangalore market. A price spread study showed that a basket of 6 kg tomatoes was sold to retailer at Rs. 8.75 while the producers received only Rs.2.10 for the same. A break-up of market costs showed that this basket of 6 kg tomato cost Rs. 3.10 to wholesaler. Thus, wholesaler got a clear margin of Rs. 5.60 on 6 kg (Rs. 0.90 per kg) when prevailing wholesale price ranged between Rs. 1.40 and Rs. 1.80 per kg, indicating the imperfect marketing conditions prevailing at the wholesale level.

**Vegetable farmers**

Indian vegetable farmers are quite diverse in terms of the crops they grow. Not only the climate and soil dictate the types of vegetables to be grown, but also local culture and food habits. It is important to take all of these factors into consideration when promoting local vegetable crop industries.
Most vegetable farmers in India are small in scale, ranging from 0.2 to 5.0 hectares and many of them recognize that the potential income from growing vegetables is higher than that of growing cereals. In some of the zones, e.g. Zones II, and III, the undulating land is also a major problem for the growers. These farmers also recognize that since vegetables are perishable, risks associated with growing vegetables are higher. This type of situation is prevalent in almost every zone within the country.

Vegetable farmers in India are aware of the importance of good quality seeds. A number of seed companies have emerged in India over the past 10 years. However, their focus is primarily on a few moneymaking vegetables such as onion, tomato, chilli, pepper and okra. The public sector has a role to play in supporting the needs of small-scale farmers. Besides assisting seed companies with research on major vegetables, the public sector can assist in providing high quality seed of improved varieties of specialized indigenous vegetables in each state for niche marketing.

In rural areas the literacy rate is much smaller compared to urban areas. Therefore, education, extension, empowerment and entrepreneurship development is extremely important. Since women are more involved than men in vegetable production and marketing, the empowerment of women is critical, especially in the areas where literacy rate is very low, e.g. in parts of zones – I, IV, V and VI.
comprising of states like J&K, Himachal Pradesh, Uttar Pradesh, Bihar, Madhya Pradesh, etc.

**Marketing intelligence**

For small-scale vegetable farmers to succeed in meeting the demands of our expanding market economy, it is extremely important that they organise themselves into farmers' cooperatives (farmers' association) and link themselves at the district level or link with state cooperatives at the national level. These cooperatives need access to market intelligence for both domestic and international markets. By having reliable and timely supply-and-demand information, vegetable farmers can decide on the commodities and the area to be planted in order to meet the demand, yet avoid gluts and disappointments. The Ministry of Agriculture and the Ministry of Processing Industry need to vigorously and proactively canvas and bring orders for export of various vegetables from different states to countries around the world. To avoid crises and risks, early warning systems and risk relief measures need to be in place to ensure economic security.

Studying the problems and emerging needs of horticultural marketing in north western Himalayan region of India, it was found that producer's share of the consumer's rupee is very low, and this needs immediate attention.
Important issues

Most issues related to supporting vegetable farmers revolve around connecting these farmers to the expanding domestic and international markets. This involves: improving the quality of vegetables and fulfilling sanitary and phytosanitary (SPS) requirements. This is especially vital for the export market. Even for the domestic market, consumers are becoming conscious about quality. India is quite familiar with the CODEX alimentarius of the FAO. Although there is an international standard for quality and SPS, the Indian Government has to come up with its own Indian Standard for Quality (ISQ) and make it so attractive that its neighbours and others can follow and the foreign importers can accept it.

Developing appropriate post-harvest technology, both for fresh market sales as well as for value-added processing is very essential. Our efforts should promote the establishment of small-scale collecting, cleaning, pre-cooling, grading, and packaging centres in rural areas in all the major regions of every zone.

Improvement in supply chain management (SCM)

The farm gate price in India is 25 per cent of the retail price compared to 70 per cent in Holland and the U.S. We need to increase it to at least 50 per cent. The present day consumer is health, nutrition and safety conscious, and seeks convenience in foods.
**Technology needed**

Good quality seed is a must for a successful crop growing. Both the public and private sector should develop and make available quality seed of vegetables at reasonable prices. Credit systems need to be in place to increase access of seed and other production inputs to farmers. Profitable and sustainable crop management packages need to be developed and disseminated to farmers. Simple, affordable and durable post-harvest technologies for small-scale farmers for use at the farm level are urgently required in the regions where tomato and chillies are undertaken in greater holdings e.g. in zones II, IV, V and VI. Small-scale processing facilities, pre-cooling and cold storage facilities are needed. The Central Food Technology Research Institute in Mysore, All India Coordinated Research Project on Post-Harvest Technology (AICRPPHT), and the Central Institute for Post-harvest Engineering and Technology (CIPRET) should come up with practical solutions to post-harvest constraints for dissemination and adoption by farmers and processors.

**Infrastructure**

In each village, farmers need to organize themselves and establish a vegetable collection centre. Transportation to and from the farm is still a major problem in majority of the solanaceous vegetable growing areas in the country. Proper roads and transports should feed into the main roads. Improved infrastructure will help harvested
vegetables to be cleaned, pre-cooled, graded and packaged for shipping to domestic and international destinations.

The government needs to encourage the establishment of entrepreneurs, both small and large in scale, in value-added processing. This can be done through the establishment of vegetable processing parks/corridors, special vegetable export zones and vegetable processing parks in each state/ zones.

Policy issues

The government should encourage partnerships between research institutions, agricultural and engineering universities, non-governmental organizations (NGOs) and private industries to address constraints and link vegetable farmers to national and international markets.

With economic liberalization, globalization, and the WTO, policies should be carefully drafted to see that the private sector, through contract farming and other methods, encourages small-scale farmers to grow quality vegetables. The government should assist in the development of markets, move forward with vegetable fairs to attract foreign buyers, and create more awareness of the importance of safe vegetables in diets.

The main problems associated with marketing of green chillies were absence of cold storage structures, high transportation cost, lack of
The government should assist small-scale units to come up with attractive "brands" and creative labelling of products with safety assurance, which the international and domestic buyers can rely on. The government should also encourage women entrepreneurs to take up vegetable production, processing and marketing. Attention to the vegetable sector in general and solanaceous vegetables in particular has gradually increased over the past years. Solanaceous vegetable contribution to balanced nutrition, economic development and alleviation of poverty has been widely acknowledged by researchers and policymakers. Domestic solanaceous vegetable sector is of growing potential but to a large extent along informal supply chains and informal marketing structure. Exports of vegetables on the other hand face challenges such as increasing standards of production. Although attention from research institutions and policy makers to the positive development potential of solanaceous vegetables is increasing, so far no attempt has been made to fill the gaps in global production standard and marketing infrastructure in India. The gaps are especially apparent in the lack of socio-economic knowledge of the vegetable production and marketing systems, which are often highly commercialized with highly dynamic but informal markets.
Solanaceous vegetable production

Solanaceous vegetable production is a monoculture in few selected regions of some zones, but in majority, it is produced on small landholdings in various cropping patterns or in homestead gardens. India being a vast country with a large variety of agro-climatic conditions can produce vegetables round-the-year by cultivating, well adapted varieties to climate and seasonality. Several states/zones have become specialized in a type of vegetable crop for a particular time of the year. This potential can be harvested with proper policies and encouragements to the farmers of solanaceous vegetable growing areas.

Production related issues

The main issues that need immediate attention are adequate seeds of varieties (hybrid and open pollinated) responding to specific area is not always available in every part of the country. Seasonality of vegetable production is a general problem in India. During the winter season, abundant solanaceous vegetables are available often leading to market price fluctuations and a low profitability for the growers during that season. During the off-season (summer), critical weather conditions prevent solanaceous vegetable cultivation and these results in a scarcity of these vegetables and very high prices.
The study on analysis of vegetable crops in Chhattisgarh region of Durg district found that major constraints were poor quality of seed, lack of knowledge, imbalance use of fertilizers, selection of good quality pesticides, scarcity of hired labour supply, lack of cold storage facility to fetch good prices for vegetables during the off-season, absence of regulated markets, non-availability of credit for acquiring infrastructure development in vegetable farms and malpractices in the marketing of vegetables.

A study on comparative economics of vegetable and non-vegetable farms in Mugdi tehsil of Bilaspur district of Madhya Pradesh was conducted. It was found that major constraints were lack improved or high yielding good quality seeds, appropriate package of practices for vegetable crops in the region, coordination among the different departments, lack of technical staff, crop specific training programme, appropriate gross root level planning, lower price of the vegetables and lack of processing facilities and cold storage etc.

The post-harvest losses, factors affecting marketable surplus and the problems during different marketing operations in Solan district of Himachal Pradesh was examined. The study revealed that during storage at farmer’s level the losses to all the major off-season vegetables viz; tomato, capsicum, beans and peas were highest. This was followed by transportation loss for tomato and capsicum because of distant sale. While in case of beans and peas, the losses were
higher in the market itself mainly because of unauthorized deductions by commission agents. Higher production and minimization of losses were likely to enhance the market surplus. The establishment of processing industries using fresh vegetables as raw material, formation of cooperatives in vegetable growing areas and strengthening of market intelligence network were some of the major suggestions for the overall development of the area in general and vegetable growers in particular.

Some of the major problems related with production at producer level in majority of zones include:

- Lack of information on production technologies regarding horticultural varieties and package of practices
- Lack of labour force for timely production operations
- Non availability of credit support for solanaceous vegetable growers
- Non availability of quality inputs like seeds, agrochemicals and fertilizers
- Low production at the farm level
- Incidence of pests and diseases
- Lack of awareness on global production standards
- Lack of proper irrigation facilities in many areas of the country
Problems and Prospects of Solanaceous Vegetables

• The poor and marginal farmers of the country cannot afford to grow vegetables because of the high initial investment (cost of hybrid seed, input, and high risk crop)

• Improper marketing channels of fresh vegetables, lack of infrastructure, and social problems related to the strong hold of middlemen in the marketing chain.

Strategies and policies to improve vegetable production

Some of the important suggestions that could help to reverse the production trend at the farmers' field are elaborated below:

In order to meet the requirement without affecting the domestic supply, there is need for a well thoughtful strategy for the coming years so as to produce quality crops at competitive price and remain regularly in the market. Following are the suggestions for improvement:

• Export policy should be long term and consistent. Frequent changes in export policy should be avoided in view of likely adverse affects on foreign markets and growers.

• Exclusive production of different vegetables for different seasons in suitable pockets in selected zones should be arranged so as to continue supply throughout the year at competitive price without affecting domestic supply.

• It is necessary to arrange survey of various foreign markets
for their variety and quality requirement and arrange production accordingly. Diversification of export should be done both in terms of countries and commodities for increasing the quality and also value.

- Suitable pockets in selected agro-climatic zones for growing different vegetables economically round the year should be identified and agro-techniques from export angle for production of quality produce of different crops should be standardized. Organic farming as well as integrated pest management should be introduced. Exclusive production of suitable crop / varieties for export as fresh and in processed form should be introduced.

- Production and distribution of quality seeds of different solanaceous crops may be arranged in adequate quantities by different seed producing agencies.

- Pre-cooling units and cold storage for fresh vegetables should be established for prolonging the shelf life and minimising the losses in post harvest handling especially in case of tomatoes.

- Ventilated and temperature controlled transport system should be introduced and highest priority for loading and transportation should be given for all the three solanaceous vegetable crops.
Cold storage and transit ventilated storage facilities as per the need of different solanaceous vegetable crops should be created at all ports / airports where vegetable export is being taken.

Packing material and size etc. should be according to demand of foreign markets as also should be cost competitive.

Export promotion programme of solanaceous produce should be carried out in different countries to establish superiority of taste, flavour, etc.

**Development of high yielding varieties**

In view of the importance and the progress achieved by hybrid technology in solanaceous vegetables, the use of hybrids should be popularized further and its development should be strengthened. Private companies and public sector organisations should develop more hybrid varieties in more solanaceous vegetable crops that offer hybrid vigour. Multiple disease resistance or tolerance should systematically be incorporated in hybrids. Attention should be focused on reduction on hybrid seed production costs through development of male sterility and other methods. To help the farmers who are not in an economic position to purchase hybrid seed, research and development on open pollinated varieties should be continued and good quality open pollinated varieties should be made available to
them. Although, under the All India Coordinated Vegetable Improvement Project, a number of varieties have been identified for various zones in the country refinement and promotion/extension of these high yielding varieties is needed for successful production.

All year round solanaceous vegetable production

In many agro-climatic zones of India, main season for production of solanaceous vegetables is when climate is mild and congenial. In vast majority of the places, solanaceous vegetables are not being produced round-the-year by increasingly adopting protected cultivation techniques. In tropical countries of Asia, the technologies like raised bed or plastic covered cultivation are mere improvements, but much more needs to be done. During the hot and humid season, protected cultivation under greenhouses or plastic tunnels appears to be a problem. In the hot dry areas, cooling pads can be used to cool down the temperature by a few degrees, but these techniques is not applicable under few zones having tropical humid climates. The only possibilities to limit the effects of seasonality remains to choose adequate cultivars for specific areas and season or to shift the production in the appropriate location for each season (hilly regions in summer).
Impact of climate change on solanaceous vegetable production

A significant change in climate on a global scale will impact agriculture and consequently affect the world’s food supply. More erratic rainfall patterns and unpredictable high temperature spells will consequently reduce solanaceous vegetable productivity. Developing countries in the tropics like India will be particularly vulnerable. Latitudinal and altitudinal shifts in ecological and agro-economic zones, land degradation, extreme geophysical events, reduced water availability, and rise in sea level and salinization are postulated.9 Unless measures are undertaken to mitigate the effects of climate change, vegetable production in developing countries in the tropics will be under threat. It is unlikely that a single method to overcome the effects of environmental stresses on vegetables will be found due to wide agro-climatic diversity in the country. A systematic approach, where all available options are considered in an integrated manner, will be the most effective and ultimately the most sustainable, particularly for zones IV, VI and VII under a variable climate. This holistic strategy will need complete integration of efforts; the resulting synergies will produce impact more quickly than the individual institutions working in isolation could accomplish. For this to succeed, adequate and long-term funding is necessary, scientific results have to be delivered, best approaches utilized and effective methods sustained to deliver country wide public goods for impact.
Deficiencies in marketing of produce

It has been noticed that the farmers of almost all the zones do not fully realize value for their inputs such as labour. One of the important factors responsible for this has been that the greater share goes to pre-harvest contractors, middlemen, transporters, wholesalers and retailers who are all involved in the channel from farm to the consumer. As a result of the large number of intermediaries in the channel and high cost of transportation, both producers and consumers are not benefited. Added to this, the existing supply chain in all zones is inefficient and built around obsolete/outdated warehousing, logistics and transportation technology\textsuperscript{10}. In this scenario, remedying the bottlenecks from farm to market should receive even greater attention than on increasing farm productivity. In fact without efficient logistics and marketing, increase in production can only lead to a glut which results in greater misery than help to the farmers.

In order to raise the farmer's income two important aspects that need attention are: i) creation of an integrated and assured competitive market, and ii) improvement in communication, transport, storage, distribution and other services\textsuperscript{11}. Efforts were made to curtail the activities of middlemen by way of market regulation, farmers' cooperatives, contract farming, direct marketing through local bazaars and exclusive retail markets.
The retail marketing inherently provides for profits to the retailer, better price to the farmers and quality produce to the consumers. Freshly harvested solanaceous crops’ being perishable in nature the retail boom assumes special significance in this area and retail revolution is the buzz word. The basic premise on which the retail boom is based is that urban areas serve as growth centres with an assured market for the produce from rural areas.

With changing life style and consumer habits, a massive awakening amongst the consumers is taking place. More and more people are prepared to pay higher price for speed and convenience. The retail boom is thus an outcome of an enlarged consumer population willing to spend more for better comforts and life style. As the urban population density is high, it demands a network of retail markets.

**Reduction of post harvest losses, and improvement of marketing channels**

After production, up to 40 % of the produce is lost due to poor handling, difficult transport, storage, and many other problems through the various stages in the marketing chain. Regarding post harvest losses, National research programs have developed technical solutions to post harvest losses, and improved varieties with better keeping quality can be used, but the main problem remains the improvement of the marketing channels. These are national policies to be addressed, which include improvement of collection centers,
wholesale markets, availability of suitable packaging material, improvement of infrastructure, incentive to private vegetable marketing business.

In the more advanced countries, the vegetable marketing through supermarkets, and modern grocery stores, with modern facilities, have reduced considerably the post harvest losses, but the price of vegetables has become very expensive, and beyond reach of the poor classes. Traditional markets prevail in all states of the country and are very complex. Wholesalers and middlemen are controlling the marketing of vegetables at every levels, which is also creating barriers to development. Appropriate government policies, information (market information), training, and incentives to the private sector are the only keys to improve the marketing of vegetables.

The post-harvest losses during storage, transportation and marketing of major vegetable crops was calculated\(^1\); quantified the factors affecting marketed surplus and investigated the problems cultivators faced in storing, transporting and marketing of vegetables. For the study, a sample of 60 farmers was selected from Solan and Kandaghat blocks of Solan district, Himachal Pradesh. The study shows that the highest percentage of losses occurred during assembly and transportation for tomato and capsicum, whereas assembly and market operations caused major losses for beans and
peas. Increased production and minimum post harvest losses were important factors for increasing marketed surplus. Costly wooden boxes, time-consuming manual grading, distant markets, high transportation charges, malpractices in the market and lack of market information were the major problems faced by growers.

A comprehensive study of the vegetable marketing system is necessary to understand the complexities involved and to identify bottlenecks with a view to provide efficient services in the transfer of farm products and inputs from producers to consumers. An efficient marketing system minimizes costs and benefits of all sections of society. Expectations of the system vary from group to group and the objectives are often in conflict. The efficiency and success of the system depends on how these conflicting objectives are resolved.

**Inter-relationship of production and marketing**

It is not enough just to produce a vegetable; it must be produced efficiently and marketed successfully. It is necessary to improve the marketing system to aid development for two reasons: firstly, if additional produce does not fetch additional revenue in the market, it may work as a disincentive to increased production; secondly, if the market does not supply consumers with produce at reasonable prices and at the time and place needed, then increased production has no meaning in a welfare of both producer and consumer.
Like any marketing system, solanaceous vegetable marketing is a process which begins with the decision to produce saleable commodity and involves all aspects of market structure, functional and institutional, based on technical and economic considerations. It also includes pre- and post-harvest operations – assembling, grading, storage, transportation and distribution. Increased production results in a greater percentage increase of marketable surplus, accompanied by an increase in demand from the urban population which ultimately calls for rapid improvements in the existing vegetable business system.

As a link between producer and consumer, marketing plays a very important role, not only in stimulating production and consumption but also in increasing the rate of economic development. Its dynamic functions are thus of primary importance in promoting economic activities and it has therefore been described as the most important factor in the development of the vegetable business. This practice should be followed in every vegetable growing areas in all the zones.

The price spread in the marketing of vegetables in Delhi market was studied and it was observed that despite favourable economic incentives, the acreage and production of vegetables around Delhi is inadequate and a substantial part of the marketed vegetables are brought in from outside. None of the 10 formal and informal marketing channels operating in Delhi markets were satisfactory in all
respects. The semi-government and cooperative trade channels handle a very small amount of vegetables. On the other hand, the margins of middlemen in private trade channels were so high that producers scarcely obtain 40% of the consumer price. There is thus a case for the expansion of the area under vegetables and the marketing network requires improvement through strengthening of the cooperative sector and regulation of middlemen margins.

**Solanaceous vegetable marketing**

Solanaceous vegetables producers want the marketing system to purchase their produce without loss of time and to provide the maximum possible share in the consumer's rupee. They want the best possible price for their surplus produce and they also want the system to supply them with inputs at the lowest possible price. The consumers want a marketing system that can provide vegetables in sufficient quantity and of good quality at the lowest possible price. Clearly, this objective is in direct conflict with the objectives of producers. Market middlemen on the other hand are interested in a marketing system which provides them with a steady and increasing income from the purchase and sale of vegetables. This objective can be achieved by purchasing vegetables from producers at low prices and selling them to consumers at higher ones. The government has to act as a watchdog to safeguard the interests of all groups.
(producer, consumer and middlemen). Some of the major marketing related issues for solanaceous vegetables in many zones include:

- Non-availability of cheap transportation
- Lack of information regarding standardization and grading at grower level
- Poor infrastructure at market place
- Unfair deductions by marketing agents
- Non-availability of storage facilities at village/producer level
- Non-availability of market-related information regarding prices of produce and their trends at producer level
- Too much bargaining regarding prices of produce
- Uncertain arrivals of produce in any particular market
- Lack of quality produce
- Varied mixture in produce
- Highly perishable nature of produce

**Issues at the consumer’s level include:**

- Non-availability of quality vegetable produce
- Problem of varied mixture of produce
- High level bargaining
- Very high fluctuation in prices of produce
- Lack of freshness of produce
- Non-availability of standardized and graded produce
- Poor storability of horticultural produce
- Cheating during weighing of the produce
Organic market

Growth in the broader organic market over the past decade has consistently averaged about 20 percent. There is widespread optimism that sales will continue to grow as consumers become better educated about the benefits of organic farming. Expansion of the organic vegetable sector in India depends on a variety of agronomic, social and market factors. Existing and transitional growers need to recognize the challenges of maintaining soil fertility in the face of reduced livestock and forage production and the decline in the general farm economy. Alternative fertilizers from urban and industrial waste streams may provide new options for growers.

Sustained interest in organic vegetable production by a new generation of entrepreneurs will be critical especially in J&K, H.P., hills of U.P. and North eastern regions for increasing the supply of organic solanaceous vegetables. New entrants to organic farming are mostly interested in small, intensively managed farms with production matching the size of local markets. Sourcing labour will be an ongoing concern. Demand for local, organic vegetables is expected to continue to grow. A variety of direct marketing methods offer the best options for organic vegetable growers to meet this demand. Cooperative ventures and pooling of produce offer some opportunity for sales to wholesale markets and chain stores.
Retail marketing

Whether the retail boom ensures a smooth flow of solanaceous produce from farm to market is the crux of the problem. There are differing views observed in different zones for and against the retail boom with one school of thought favouring it, while the others suggest treading the path cautiously.

Because of the inefficiencies in the present marketing system, it is believed by many that retail boom brings prosperity to both the rural poor farmers and urban consumers. This is because the organized retail marketing which is now in a formative stage provides an assured market to the rural farmer and supplies better quality produce to the consumer. Another reason for advocating this is the expectation of a huge foreign investment in retail sector leading to better marketing infrastructure. An efficient marketing system can reduce post harvest losses, promote graded processing, packaging services and food safety practices, induce demand driven production, enable high value addition and facilitate exports.

With changing food habits of urban elite, middle class and particularly the youth, the domestic market is fast growing, creating a huge demand in processing sector.

The size of the Indian urban food market is estimated to be more than Rs.3.50 billions. It is estimated that during the XI Plan an...
investment of Rs. 1,000 billions is expected in the food processing sector and this sector has good potential for attracting investment and employment generation. The 'cold chain' infrastructures comprising the network of procurement, warehousing, transportation and retailing of produce/food products under controlled temperature is highly fragmented.

It is going to be an integral part of the supply chain in an expected retail boom as 30 per cent of our fruit and vegetable produce is wasted for the lack of cold chains. It enables in maintaining a steady supply and reliability of produce and also helps in retaining its freshness and nutritive value. Retail boom will result in large investments in cold chains.

The retail boom can have backward linkage with the rural farmers and forward linkage with the urban consumer. Organized retailing has the potential to ensure assured market for the farmers and supply of quality produce to the consumers.

**Disadvantages of retail markets**

One of the impacts of the retail boom is the expected decline of existing small, family operations caused by the big retailer. In particular, poverty is bound to rise if displaced retail workers seek employment at the big stores at lower wages as they have no viable alternative. Moreover, all the displaced persons are not likely to be
accommodated by the big retailer. The altered scenario in the supply chain will have a huge bearing on the livelihood of the millions of shop keepers and street vendors in the unorganized sector and their livelihood. This will have profound bearing on income distribution resulting in greater disparities. Another important aspect is the foreign direct investment. Surpluses by big foreign investors are likely to be siphoned off and not invested locally with the result that this capital will not be available to the local community.

Some of the retail giants with financial potential can initially afford to purchase produce at a higher rate and sell for less than the cost price at retail outlets in order to eliminate middlemen. Once that is achieved, it is likely that they will have a monopoly over the producer and the market and shift from consumer friendly scenario to a squeeze on consumers. There is a danger of some retail giants taking an upper hand in pushing forward their profit motto, unless properly regulated. The retail mania could make the traditionally saving Indian consumer society into a spending class as in advanced countries. The consumer is likely to switchover from the present 'earn and pay' tendency to 'earn to pay' attitude. It cannot be afforded to follow exactly the example of western retail sector. India has still a large population below the poverty line and the disappearance of unorganized marketing structures can lead to a catastrophe.
Marketing reforms

The emergence of organized retailing in recent years and the creation of quality retail space have led to an increased demand for quality produce and thereby investments in supply chain infrastructure by private players. Reliance initiative, for example, in big cities of different zones, conceptually, is expected to bring a virtuous cycle of prosperity by bringing farmers and consumers together in a mutually beneficial partnership.

The vegetable marketing in Sri Lanka at primary, wholesale and retail level was studied and it was found that about 80 per cent of the vegetables were marketed by the private sector at all levels. It was concluded that while producers do not receive reasonable prices for their produce, consumer pays high prices due to many factors such as behaviour of middleman, the monopolistic operations of transport system and poor storage facility provided at government collection centres. Action at both the government and producer level is needed for efficient marketing.

Marketing reforms are needed as they are critical to development of the potential urban food demand. This needs encouragement of public-private partnerships as they ensure efficient resource utilization and better management practices besides encouraging private sector investments to tap their huge potential for infrastructure development.
Major limitations in vegetable cultivation/marketing

Adopting vegetable growing as business has several limitations also. In nutshell, some of these limitations prevailing in most regions are:

**Perishability:** As vegetables are perishable in nature, they need either very quick disposal (which causes glut in season) or proper processing (which is still lacking in our country) from the areas with greater production. India is world's second largest producer but 35% of produce is lost due to poor post harvest management.

**Infrastructure (cold chain, roads, power and transportation):** Vegetables have very specific handling and storage requirements if their quality and freshness has to be maintained. Moreover, each product needs to be stored at specified temperature and humidity levels. Multi-chamber, multi-product cold stores are more suited for storing such produce. Cold chains are an essential part of managing transfer of both the raw material as well as the processed products from one place to another in many zones of the country. Cold stores without the support of adequate cold chain infrastructure lose their significance as the quality of even a well-preserved raw material or processed product will deteriorate if not handled properly while transporting. Today cold chains are required right from the farm gate till the end product reaches the consumer. Other infrastructure issues like roads, power and transportation etc. also need to be addressed to prevent post harvest losses of vegetables.17
The existing production and marketing system of solanaceous vegetables produce at every level could be improved with the following steps:

1. Storage facilities should be provided at producer and market levels.

2. The infrastructure should be improved to maintain hygienic conditions.

3. Market-related information such as daily and weekly prices of the produce should be disseminated.

4. Cheaper transportation should be provided to reduce marketing costs at producer and middleman levels.

5. Regular checks of measures and weights should be made to ensure exact weighing.

6. Extension agencies should provide information on new varieties of solanaceous vegetables and packages of practices as well as procedures of standardization and grading of produce and their benefits.

7. Improvement of infrastructure facilities of irrigation, fertilizer, pesticide etc so that growers could consider producing crops in the every zones within the country.

8. Minimize the number of middlemen in marketing channels.

9. Banking institutions should provide finance/credit with less formality to meet credit requirements.

10. Market regulatory authorities should address the issue of unfair deductions at the market place.

11. Solanaceous crop producers' co-operative societies should be formed for better performance and achievement.

12. Some specific minimum prices should be declared for solanaceous vegetables to ensure benefit for the producers.

13. Introduce essential grading and standardization packing and packaging of the produce.
**Constraints in vegetables marketing**

In nutshell, the major constraints faced by all groups are given hereunder:

1. The infrastructural problems, pertaining to the cold storage facilities are dual as some places don't have the cold storage while some places have the problem of underutilization of the existing cold storages. The utilization is even lower than 30 per cent of the total capacity in many cases. Development of competitive international transportation, linked to domestic air transport or road and rail transport would help in reduction of post harvest losses.

2. Preponderance of intermediaries in the channel results in unfair and exploitative practices in marketing of fresh produce is very common.

3. Lack of proper grading and quality control system.

4. Scattered productions and sometimes in isolated places where even the transportation facilities and other infrastructure are not sufficient for the perishables.

5. Lack of unity and organization skill among the farming community, which proves a major constraints in the formation of cluster groups and co-operatives.

6. Inefficient and Imperfect markets: prevalence of many intermediaries and malpractices followed by them in the price fixation and auction of the perishables in between the marketing channel results in uprise of consumer's price in the producer's share.
7. Concept of consumer packaging practically unknown in domestic markets: improper pre and post harvest handling without any sound packaging leads to heavy loss ranging from 20-40 percent of the produce at the time when it reaches the final consumer.

8. Ignorance to new methods of cultivation and dependence on traders for extension knowledge.

9. Perishability and storability: having limited shelf life due to its typical bio-physiochemicals constitutions, fresh fruits and vegetables penetration is restricted to the certain niche markets and stakeholders.

10. Low exports: Emergence of many competitive markets with comparative advantages in awake of the globalization and the imposition of different tariff and non-tariff barriers to save the domestic industry by the protectionalist nations using sanitary and phytosanitary measures (SPS) as their benchmark resulting in the limited exports of the perishable commodities. The window of international demand for the horticultural products is very small. Thus, a planned strategy is to be made to target the markets during that period.

11. Long marketing channel: Prevalence of many of the intermediaries in between the supply chain taking the greater share of the producer's by deeply penetrating the consumer's pocket.

12. Non-functional AEZ: even after more than 10 years of starting of the Agri-Export-Zones in deferent specific production pockets of different produces, full implementation is at its nascent stage due to many socio-political reasons. Thus the final benefit doesn't reaching to the destined.
13. Poor post harvest care and handling of the produce: Improper pre and post harvest care and handling leads to heavy loss ranging from 20-40 percent of the produce.

14. Prevalence of primitive methods of selling and price fixation like, secret sale, private negotiation, under cover etc.

15. Meagre involvement of government and other co-operative marketing agencies alike to the private agencies.

Problems in export

Inadequate air cargo space

Except onion and tuber vegetables, all other items are transported by air. Non-availability of sufficient air cargo space at a time has been the major constraint in increasing the export. There has not been any significant increase in the space in the past.

Higher air freight

Air freight of vegetable export from India to gulf countries and U.K. etc. is very high compared to Kenya, Jordan, Lebanon, etc. This is one of the major bottlenecks in increasing the export.

Restriction in the export

Many times because of failure of a particular crop and increased local demand, the export has to be restricted. This does not allow regular export due to which we loose many foreign markets.
Non-availability of suitable varieties

For example in onion we do not have greater production of yellow onions which are in demand in European and Japanese markets. Export quality tomato, brinjal and chillies are also not available in adequate quantities which are now demanded by almost every country.

No proper packing of the produce

In solanaceous vegetables, open mesh jute bags are still being used whereas preference is there for open mesh plastic woven bags. The corrugated fibre board boxes, being used at present also do not have required strength and thus are damaged in transit.

General constraints faced by the growers in vegetable cultivation

With a view of knowing the constraints in vegetable production data were collected from all over the zones in the country with an open-end question and further grouped for its interpretation.

The data presented in Table 6.1 clearly reveals that the major constraints faced by the vegetable growers are marketing (75.34%), post harvest losses (75.34%), plant protection (57.34%) and quality seeds (57.34%).
Table 6.1: General Constraints in vegetable production as perceived by growers

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Perceived Constraints</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Bio-Physical Constraints</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>❖ Natural Hazards</td>
<td>72</td>
<td>24.00</td>
<td>VIII</td>
<td></td>
</tr>
<tr>
<td>❖ Wild Animals</td>
<td>242</td>
<td>80.67</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>❖ More disease and pests incidence</td>
<td>172</td>
<td>57.34</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>❖ Erratic power supply</td>
<td>130</td>
<td>43.34</td>
<td>VI</td>
<td></td>
</tr>
<tr>
<td>B.</td>
<td>Technological Constraints</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>❖ Lack of technical knowledge</td>
<td>156</td>
<td>52.00</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>❖ Unavailability of quality seeds</td>
<td>172</td>
<td>57.34</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>❖ Labour scarcity</td>
<td>64</td>
<td>21.34</td>
<td>IX</td>
<td></td>
</tr>
<tr>
<td>❖ Weeds problem</td>
<td>72</td>
<td>24.00</td>
<td>VIII</td>
<td></td>
</tr>
<tr>
<td>❖ Post Harvest Losses</td>
<td>226</td>
<td>75.34</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td>C.</td>
<td>Marketing Constraints</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>❖ Transportation</td>
<td>64</td>
<td>21.34</td>
<td>IX</td>
<td></td>
</tr>
<tr>
<td>❖ Storage</td>
<td>96</td>
<td>32.00</td>
<td>VII</td>
<td></td>
</tr>
<tr>
<td>❖ Irregular market and market price</td>
<td>226</td>
<td>75.34</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td>D.</td>
<td>Economic Constraints</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>❖ High rate of hybrid seeds</td>
<td>156</td>
<td>52.00</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>❖ High rate of pesticides</td>
<td>164</td>
<td>54.67</td>
<td>IV</td>
<td></td>
</tr>
<tr>
<td>❖ High rate of fertilizers</td>
<td>130</td>
<td>43.34</td>
<td>VI</td>
<td></td>
</tr>
<tr>
<td>❖ Lack of finance needed</td>
<td>54</td>
<td>18.00</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Source: Based on the questionnaire
In most of the regions farmers are facing great losses in vegetable and other farming due to wild animal, which usually attacks the field in group and apart from grazing the crop, destroy the whole farm and sometimes attack the farmers watching their field. This is the most severe constraint faced by more than 80% of the respondents. Other important constraints faced by the growers are lack of technical know-how regarding improved vegetable cultivation and higher prices of seeds, fertilizer and pesticides. The constraints faced by the farmers of this region draw the attention and requirement to educate them for better vegetable production and productivity.

Growing produce can be profitable, but not everyone who attempts to grow produce will be successful. The problems and opportunities associated with vegetable production need to be carefully considered. But of equal importance are the problems and opportunities associated with marketing. A sound marketing strategy should be developed before a crop is planted. Then, good management is needed to ensure high yields of high quality products that are packed and labelled according to market specifications. Raising the level of productivity and quality standards to internationally competitive levels is one of the major challenges following the dismantling of quantitative restrictions on imports, as per the WTO Agreement on Agriculture. For several commodities, our national productivity is less than world average. Within the country there are wide variations in productivity level. The stagnating vegetable export from country in
recent year can be traced partially to distorted domestic prices for certain products. Weakness in export infrastructure specific to vegetable products, such as storage, port handing facilities, lack of large scale processing technology and export quota restrictions makes Indian supply sources unreliable and hinder the exploitation of full export potential. The competitiveness in global market has acquired a multidimensional concept. Now it involves not only price competitiveness, but also ability to deliver the desired quantity at demanded destination in time. In developed countries, organically produced vegetables are available in the market at a premium price. The international trade in vegetable is increasingly being dominated by concern of quality to safe the human health. The developed countries are setting higher standards of quality, imposing quality barrier, called non-tariff barriers, at progressively higher levels to prevent entry of country exports into their markets.
REFERENCES


