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RETAIL MARKETING OF FRUITS & VEGETABLES IN INDIA: A CASE STUDY ON EXPORT OF GRAPES FROM ANDHRA PRADESH, INDIA*

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ABSTRACT - *To develop an innovative technique to apply retail marketing and export of grape improvement techniques to a complete supply chain from farm to consumer. Design/ methodology/approach - Action research based on a Andhra Pradesh case study involving Post harvest loss in grapes for export market. Findings - Export market highlights significant opportunities to improve fruits supply chain performance, export perspective, profitability and relationships. Originality value – Drawing on both primary and secondary data, the paper examines how increasing demand and marketing costs, wastage impact on grape grower returns. Development of supply chain improvement methodology.*

KEYWORDS - Export, Grape, Market Channels, Retail market, Supply chain, Value Chain

INTRODUCTION

In today's competitive marketplace the pressure on organizations to find new ways to shape and deliver value to customer grows ever stronger. Gradually, in emerging economies as well as developments markets, the power of the seller has overtaken that of the customer. In marketing fruits and vegetables, which are Perishable in nature, supply chain plays a crucial role. The very nature of land holding by the farmers, varied climate conditions, production spread over wide geographical area, mainly in remote villages, diversified consumptions patterns and poor infrastructure makes Supply Chain Management for fruits and vegetables complicated. Marketing of Fruits and Vegetables are challenging owing to perishability, seasonality and bulkiness and consumption habits of the Indian Consumers. In addition to this, poor infrastructure, poor equity in Supply Chain and conventional small scale unorganized retailers, make state of the art supply chain challenging in the present scenario. The Indian retail market is mainly dominated by unorganized retailers. The unorganized retailers are homogeneous group. Recent development in retailing is the entry of large number of organized retailers. As per this paper important drawbacks of the current supply chain are number of intermediaries, post harvest loss, cold storage level, high level of wastage, quality degradation, poor infrastructural facilities and high cost. Government and private operators have to join hands to improve the physical infrastructure, information sharing and the service required for quality improvement of the supply chain.

BACKGROUND

Grapes is an important crop earlier time in Greater Hyderabad city due to its valuable position among the fruits. Hyderabad grapes are very famous in early 50s and 60s. Now the area under grapes has come down drastically due to the fact i.e., lack of sufficient market to this important fruit crop and also due to its insufficient export importance in Hyderabad city. However Grape exports have come in to the business both with the forward and backward linkages. The market cost and margin of the grapes suggest that the producers mainly borne the marketing cost with greater share of the consumer rupee than other players in the supply chain system and the trend was in descending order starting from village level merchants to retailers. Interestingly, it was noticed that the players in the supply chain system were playing dual roles as wholesalers and retailers to make the product reach from producer to consumers with the help of mini trucks and they make reach the product from Hyderabad city to far places in Andhra Pradesh due to the fact of market potential in Hyderabad city and far places in Andhra Pradesh.

Andhra Pradesh was once known for "*Anab E Shahi*" grapes. However, it is now popular for "*Thomson Seedless*" variety of grapes. In Andhra Pradesh, grapes are grown in an area of 1567 ha. with a production of about 31340 tonnes. The availability or harvest season of grape in Andhra Pradesh is February, March, April are peak harvest months and January, May are off peak harvest, 5 months being the availability duration. The given information such as peak arrival months and season of availability is useful while planning market operations.

The Existing Market structure of fruits and vegetables does not adequately address the complex problems of farmers. It has low marketing efficiency, high post harvest losses and does not foster competitiveness. A modern innovative system that can reduce the vested interests of a large intermediary chain, create competition, assure quality and modernize operations with IT applications in handling of fruits and vegetables, is necessary to raise income of actual farmers. There have been very few systematic attempts to estimate the losses at each stage of handling and its causal factors. Many studies have been conducted on post-harvest losses of fruits and vegetables based on small-scale experiments but do not reflect the real situations (Ratnam and Nema, 1967; Biswas, 1969; FAO, 1981; Waheed *et al*., 1986; Government of India, 1985; Madan and Ullasa, 1993). A few studies also estimated losses at each stage of marketing but had not estimated the total value of losses at the macro level which could have provided a scientific basis for valuation (Krishna, 1976; Senthilinathan and Srinivasan, 1994; Srinivas *et al*., 1997; Gajanana *et al*., 2002; Sreenivasa Murthy *et al*., 2004). The assessment of post –harvest losses of fruits at various stage of handling would help in identifying the factors responsible for losses. This in turn would help in developing proper measures required at different stages to prevent/reduce such losses and to increase the availability of fruits for domestic consumption and for export purpose.

Fruits and Vegetables (F&V) – Production And Consumption Scenario:

F&V play a vital role in human diet as fresh foods sources of calories, vitamins, dietary fiber and special nutrients. India's vast geographical area coupled with varied climate conditions facilitates to grow a variety of F&V. If concerned effort is made by all the stakeholders, there is every possibilities that India emerges as the leading horticultural crops producing, processing, exporting and consuming country in the world. India is an agriculture based country. Hundreds

of fruits and vegetables types are grown in all parts of India. Fresh fruit and vegetable reach small scale fruits vegetables suppliers, then sent to local markets as well as fruits and vegetables exporters. Last decades have seen the number of Indian F&V suppliers and F&V exporters rising to an all time high. Especially there has been a steep rise in the number of vegetable exporters.

The horticulture export industry offers an important source of employment for developing countries. Cultivation of fruit and vegetables is substantially more labor-intensive than growing cereal crops and offers more post-harvest opportunities to add value (Joshi et al., 2004; Weinberger & Lumpkin, 2005; World Bank, 2009). Packing and processing services—such as washing, chopping, and mixing as well as bagging, branding, and applying bar codes—are now often carried out at the source rather than at the end-market destination. Despite the labor-intensive nature of the industry, workforce development has been underestimated in this sector in the past, as horticultural operations typically employed rural workers with a minimum level of education. As the complexity of the value chain increases, growing competition amongst developing country suppliers and the enforcement of strict public and private industry standards, workforce skills are becoming a more important factor for industry competitiveness.

Main stages of the horticultural value chain:

1. **Inputs:** Elements needed for production, such as seeds, fertilizers, agrochemicals (herbicides, fungicides and pesticides), farm equipment, and irrigation equipment.
2. **Production for Export:** Includes the production of fruit and vegetables and all processes related to the growth and harvesting of the produce, such as planting, weeding, spraying, and picking.
3. **Packing and Cold Storage**: Grading, washing, trimming, chopping, mixing, packing, and labeling are all processes that may occur in this packing stage of the value chain. Once the produce is ready for transport, it is blast chilled and placed in cold storage units ready for export.
4. **Processed Fruit and Vegetables:** include dried, frozen, preserved, juices, and pulps. Many of these processes add value to the raw product by increasing the shelf life of the fruit and vegetables.
5. **Distribution and Marketing:** The produce is distributed to different channels including supermarkets, small scale retailers, wholesalers, and food services.

Due to the fragile and perishable nature of the product, this industry requires a high degree of coordination between the different actors along the chain and each stage requires a strong emphasis on workforce development to drive both productivity and upgrading. Logistics and transportation are key supporting activities in the global fruit and vegetable value chain. These functions ensure the perishable product reaches its destination in good condition. Cool storage units are used throughout the chain to keep the produce fresh, and both air and sea freighting supported by the cold chain are key elements to ensure timely delivery.

Objectives:

1. To improve returns of the farmers with the reduce of waste and post harvest losses
2. Enhance market efficiency and to reduce intermediary chain and create competition
3. To assure quality of produce and modernize operations with IT-applications

METHODOLOGY

The study covers the marketing of Grapes from Supply chain and export perspective. The present study is based on information collected from: the market officials of the selected fruits and vegetable markets, commission agents/wholesalers, retailers and farmers in and around the selected Areas. The market officials were consulted for gathering the information on the overall activities of these markets, marketing infrastructure and other related information for the selected study areas.

Sampling and data collection:

As Thomson seedless is the most popular variety of grapes grown in Andhra Pradesh, the post harvest loss was assessed for this variety. Multi-stage random sampling technique was used to select the district, mandals, farmers and the retailers. Ranga Reddy district produces about 86 per cent of the grapes in Andhra Pradesh with an area of 1345 ha and a production of 26900 tonnes. Hence, Ranga Reddy district was selected for the study. The post harvest loss assessment was taken up in this district during February-March 2010. The data was collected from the produces based in Keesar, Medchal and Shameerpet mandals.

Estimation of post harvest loss:

At the field level, the loss was estimated from 25 sample farmer's fields. Each sampling unit was made up of 3 sample boxes from each field. The loss was estimated at the time of harvest. Since the produce is transported to distant markets the market level loss was not estimated. However, since the produce is also directly sold to the retailers, the loss at the retail level was estimated from a sample of 19 retailers and each sampling unit was made up of 3 bunches from each retailer. Since grapes are also exported from the study area, efforts were made to assess the post harvest loss of the exportable grapes at the field level and also at the cold storage level.

Marketing channels and post harvest loss:

The practice followed in marketing of grapes was examined to know the marketing channels, to assess the post harvest loss and the marketing cost. However, since all the producers opted for field sale to the distant market wholesalers or to the local retailers, no cost was incurred by the producers on marketing.

Marketing channel:

The marketing channels followed for grapes by the producers are as below:

1. Producer→ Commission Agent/Wholesaler (Distant market) → Retailer→ Consumer (Domestic market)
2. Producer→ Retailer (Local market) → Consumer (Domestic market)
3. Producer→ Cold Storage → Exporter (Export market)

Post-harvest loss in grapes for domestic market:

Though Channel I was very popular among the producers, since grapes were transported to distant markets like Bubhaneshwara and Cuttuck in Orissa, Vishakapatnam, Vijayawada Kakinada in Andhra Pradesh etc., the post harvest loss at the market level in the channel could not be worked out. In channel II, the post harvest loss was estimated from the field level and also

at the retail level. The losses at the field level and at the retailers' level are presented in Tables 1 and 2.

Table 1. Post Harvest Loss in Grapes at the Field Level

S.No.	Types of loss	Per cent of loss (%)
1	Harvesting injury	0.014
2	Malformation	0.005
3	Rotting	0.006
4	Immature	0.200
5	Shrivelled	0.008
6	Waste	0.790
7	Mummies (Dry/water berries)	1.120
8	Cracks	0.009
9	Berry drops	1.130
10	Diseased	0.110
Total loss		3.400

Table 2. Post harvest Loss in Grapes at the Retail Level

S.No.	Types of loss	Per cent of loss (%)
1	Partially damaged	0.11
2	Rotten fruits	0.12
3	Water berries	0.96
4	Diseased	0.04
5	Loose berries	3.33
Total loss		4.56

It may be observed from the above tables that the total post harvest loss in grapes in channel II was found to be 7.96 per cent. The field level loss was found to be 3.40 per cent and the loss at the retail level was slightly higher at 4.56 per cent. At the field level the water berries and the berry drops were found to contribute more towards the loss. But, at the retail level, the loose berries accounted for the highest percentage of loss.

Post harvest loss in grapes for export market:

In channel III i.e. for export, the produce was sorted at the field level itself before it was transported to the cold storage for pre cooling. After reaching the cold storage, again the produce was sorted out depending upon the requirements of the exporters. Accordingly, the loss occurring at the field level and at the cold storage level was worked out. The results are presented in Table 3.

Table 3. Post harvest loss in Grapes at the Cold Storage Level

S.No.	Stages/Types of loss	Per cent of loss (%)	
1	Field level		7.82
	a. Mummies	0.02	
	b. Harvest injury	0.57	
	c. Water berries	6.72	
	d. Immature	0.26	

	e. Malformation	0.25	
2	Cold storage level (Damaged and discarded)		12.13
Total loss			19.95

It may be noted from Table 3 that about 20 per cent of the harvested grapes is lost at the field level and at the cold storage level. At the field level, the water berries accounted for about 87 per cent of the total loss. It is to be noted that at the cold storage, the produce is standardized for bunch weight of 350-400 g and is packed in polythene bags and kept for pre cooling before it is exported. During the process, the loose berries and the damaged berries are discarded. Hence, a loss of about 12.13 per cent was noticed in the cold storage.

Trend in prices and arrivals of grapes in Hyderabad market:

The analysis of data on prices and arrivals of grapes coming to Hyderabad market for the period from 1991-92 to 2000-01 indicated that the prices were growing at a rate of 8.67 per cent per annum and arrivals at the rate of 22.04 per cent annually thereby suggesting that over the years there has been an increase in the arrival of grapes in the market.

Price Fluctuations in Grapes:

A price of fresh Grape fluctuates due to a number of reasons. Prices go up due to lower production because of water shortage in production season and unusual rains during harvest time that adversely affect Grape production. With its highly developed export trade, the prices of grape in the local market are influenced by export performance. When exports are high the prices in the local market are stable and remunerative for farmers. However due to high levels of competitiveness in the international Grape trade sometimes the Indian Grape fetches lower prices. This will lead to less export during the season and more availability in local market with reduced price realization by the farmer. An efficient Terminal market system would account for such contingencies and effect appropriate distribution and utilization plans to minimize price fluctuations. One of the effective ways of addressing price fluctuation problem is through more efficient and modern marketing practices including the setting up of Terminal market. With better post harvest management practices, better handling, storage practices, opportunities for quick and cost competitive transport plans and processing options the proposed Terminal market is well equipped to address this problem. With good tie ups, backward and forward linkages the Terminal market is in a position to contribute to better production planning by farmers. It can provide farmers with feedback on consumer likes and requirement and help them in production planning and help tie up in marketing.

Suggestions:

- Capacity building and increase knowledge levels of farmers in production and export.
- Availability of simple user friendly technologies relating to Production, Processing, storage, packing and quality control by adopted technologies Increase benefit to Stakeholders
- Need to train the farmers and processors on latest technologies and management approaches would lead to future replication at a large scale benefiting the Food Sector.
- Improvisation of basic infrastructure

Policy Implications:

The creation of sound infrastructure of research on horticultural crops has helped to increase production. The increased role of research in the recent years also helped to maintain a sustainable horticulture. However, innovation in institutional support is required. For example, production under the contract system of farming ensures a confirmed income to growers along with no or less risk in product marketing. Further, there may be chance of exporting the produce to other countries and as a result a share of such profits can be given to the grower.

The identification of Agri-export zones would help in addressing problems of marketing of produce in the wake of changing global policy environment.Development of certain critical management inputs particularly that of supply chain management collaborating with other stake holders along with efficient vertical and horizontal integration is very much needed. Therefore it is to be prioritized with regard to horticultural products. Therefore, further development research on issues like genetic engineering, biotechnology, integrated and stainable production systems, Post-harvest handling storage, marketing and consumer education is also as a important as a policy. These technological and associate institutional changes identified as above naturally become thrust areas for future development of horticultural sector. Further, it improves the chance of exporting quality horticulture products. All these efforts in due course of time not only helps in the overall growth of economy , but also creates employment opportunities and helps in the upliftment of small and marginal farmers.

Thus the government should create a positive environment that will ensure a mutually beneficial relationship between farmers and organized sector. Along with investment in infrastructure, development of extension activities and linkages with farmers is also an important area where government can play an influential role.The horticulture products are considered as high value products by virtue of their freshness, export earnings and multinational importance. Therefore both to increase the income of poor rural and urban families, as well as contribute to improving their livelihoods (including nutrition and health), it is essential to address the need to promote value added products is horticultural crops. It must include.

1. Strategic positioning and priority setting in research and development on high value horticultural crops.
2. Research in markets, institutions and policies required for value added products in the context of complex and dynamic relationship between the components.
3. Post-harvest management and small scale processing units in rural areas.
4. Market-chain development, involving various forms and levels of linkages (rural-urban linkage, Private - Public sector linkage and formal - informal markets linkage.)
5. Identification of policy measures and other mechanism to facilitate increased income generation from fruits, vegetables and flowers.
6. Key elements of cropping systems information, processes and tools that provides insights on business models that reduces poverty.
7. Identification of nutrition and health opportunities of selected high value crops and how to exploit those opportunities most effectively.
8.

CONCLUSIONS

The producers of grapes in Andhra Pradesh sold grapes in the field itself to the distant market wholesalers and to the local market retailers. Grapes are sold to the exporters in the field. The exporters transport the produce from the field to the cold storage for pre cooling before export to Dubai and UK. The post harvest loss in grapes for the domestic market at the field level was found to be less at 3.40 per cent and this was attributed to the practice of cleaning the bunches 15 days before harvest. The water berries and the berry drops were the major components of losses at the field level. For the export market, the loss at the field level was found to be around 8 per cent. In this case also, water berries were the major causes of loss thereby suggesting that there exists scope for research to sort out this problem. There has been a rising trend both in the prices and arrivals of grapes in the Hyderabad market.

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