

Post-Harvest Technologies and Marketing Channel in Tomato Production in Danna Katchely, Azad Jammu Kashmir

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Abstract

Tomatoes have become one of the most popular and widely grown vegetables in the world. Post-harvest technologies greatly influence the level of post-harvest losses and the quality of produce. These technologies are; grading, packaging, pre-cooling, storage and transportation. An efficient marketing system is essential for sustained agricultural development. It affects both producer's income (through prices producers receive for their products) and consumer welfare (through prices consumers pay for agricultural commodities). There are several factors, which influence the efficiency of tomato marketing including perish-ability, seasonality, quality, prices and location of the products (Kohls and Uhl, 1985). This study was conducted with the following objectives: 1) to examine post harvest technologies in tomato growing in Danna Katchely, Azad Jammu Kashmir (AJK). 2) to study the marketing channel followed by tomato growers. 3) to recommend remedial measures for making improvements in the system

The results indicated that tomato growers in the study area were not following post harvest technologies that include; grading, packaging, pre-cooling, storage and transportation. Bulk of tomato surplus produce was marketed through local market (75%). A small quantity (25%) was marketed through wholesale market.

Key words: tomato cultivation, post harvest technologies, marketing channel, Danna Katchely, AJK

Introduction

Tomatoes have become one of the most popular and widely grown vegetables in the world. Post-harvest technologies greatly influence the level of post-harvest losses and the quality of produce.

These technologies are; grading, packaging, pre-cooling, storage and transportation (detailed references are well documented; Ryall and Lipton (1979), Ryall and Pentzer (1982), Pantastico (1975) and Hardenburg et al. (1986). In fruits and vegetables the quality of produce deteriorates after some time of their harvest. There are no generally accepted methods for evaluating post-harvest losses of fresh produce. In the appraisal of an existing marketing operation, the accurate evaluation of losses occurring is a problem. It may be suspected that losses are too great, but there may be no figures to support this view because: 1) records do not exist and if available do not cover a long enough period of time 2) the figures available are only estimates made by observers, and 3) loss figures may be intentionally over or understated for commercial or other reasons in order to gain benefits or to avoid mortification.

Raja and Khokhar (1993) stated that post harvest losses in fruits and vegetables range from 25-40% or even greater. The post harvest losses of tomato crop in Peshawar valley accounted for 20 % of the total produce (Iqbal 1996).

An efficient marketing system is essential for sustained agricultural development. It affects both producer's income (through prices producers receive for their products) and consumer welfare (through prices consumers pay for agricultural commodities). There are several factors, which influence the efficiency of tomato marketing including perish-ability, seasonality, quality, prices and location of the products (Kohls & Uhl, 1985).

This study was conducted with the following objectives: 1) to examine post harvest technologies in tomato growing in Danna Katchely, AJK, 2) to study the marketing channel followed by tomato growers, and 3) to recommend remedial measures for making improvements in the system.

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Materials and Methods

Study area, data collection and method of analysis

The study was conducted in Danna Katchely area of Muzaffarabad district, AJK being the major tomato growing area to assess post harvest technologies and marketing channel followed by tomato growers.

This study was based on primary data collected from tomato producers during 2004. Sample survey was carried out and personal interviews were held to collect the information. Before launching the survey questionnaire was pre tested and was improved accordingly. Key informant technique was also followed to get authenticated information.

The survey included 100 randomly selected tomato growers.

There are many estimation techniques. Frequency tables are very useful in knowing the trend related to a particular variable. The same technique was followed in analyzing results of this study. Percentage method was used to analyze farmers' responses related to post-harvest technologies and marketing channel. The analysis was carried out in two parts. Part A is related to percentage analysis on tomato post-harvest technologies including grading, packaging, pre-cooling and storage.

Similarly, part B is related to percentage analysis on tomato marketing channel including producer, commission agent, wholesaler; and retailer.

Results and Discussion

This section is divided in to two parts. Part A refers to post harvest technologies and Part B discusses the marketing channel available to tomato growers:

A. POST-HARVEST TECHNOLOGIES

Post-harvest technologies greatly influence the level of post-harvest losses and the quality of produce. These include; grading, packaging, pre-cooling, storage and transportation that are discussed below:

1. Grading:

Essentially all fruits and vegetables sold in modern markets are graded and sized. Sophisticated marketing systems require precise grading and standards for each kind of product. Less developed markets may not use grading and standards but the products are sorted and sized to some extent. Human eyes and hands grade the produce and many products are sized according to their weight. An inefficient sizing operation can also cause significant injuries. The results are presented in Table 1 that indicated that none of the growers followed proper grading for the harvested tomato crop.

Table 1. Post harvest technologies

Grading	Respondents (Nos)	Percent
Followers	0	0
Non-followers	100	100
Total	100	100

Source: Survey Data, 2004

2. Packaging:

There are different modes of packaging. Generally, container-packing is considered ideal for packing fruits or vegetables because these are easy to handle, provide good protection from mechanical damage, have adequate ventilation and convenient for merchandising. They could easily carry printed information about the product packed and are helpful in advertising about the product. Fancy containers such as fiberboard boxes, or wooden or plastic crates, are often used for high-value products. Inexpensive containers such as bamboo baskets or nylon net sacs are commonly used for low-priced products. The results are shown in Table 2. It is indicated that majority of the respondent in sampled area growers used bamboo baskets for packing and transporting their produce to the market whether supplied in a local or wholesale market.

Table 2. Post harvest technologies

Packaging	Respondents (Nos)	Percent
Bamboo baskets	90	90
Others	10	10
Total	100	100

Source: Survey Data, 2004

3. Pre-cooling

Temperature plays a vital role in maintaining good health of fruits or vegetables. Good temperature management is the most effective way to reduce post-harvest losses and preserve the quality of fruits or vegetables. Rapid removal of field heat by pre-cooling is effective in quality preservation and this procedure is widely used for highly perishable fruits and vegetables. Currently used pre-cooling methods include; room cooling, forced-air cooling, water-cooling, vacuum cooling, and package icing. Similarly, desirable storage and transportation temperatures for major fruits and vegetables have been identified by Kader, (1992), and Hardenburg *et al.* (1986). The results are given in Table 3. These results indicated that none of the tomato growers in the study area practiced any pre-cooling method.

Table 3. Post harvest technologies

Pre-cooling	Respondents (Nos)	Percent
Followers	0	0
Non-followers	100	100
Total	100	100

Source: Survey Data, 2004

4. Storage

Many horticultural crops have a relatively short harvesting season. Storage is needed to extend the marketing period. Air-cooled common storage houses are often used in this regard. Controlled atmosphere (CA) storage controls the concentrations of oxygen and carbon dioxide in addition to temperature and humidity. Modified atmosphere (MA) storage also controls oxygen and carbon dioxide concentrations although not as precisely as CA by using semi-permeable polymeric films. A good control of temperature, humidity and atmospheric composition maximizes the storage life span of a product. Talukder et al. (2003) studied effect of post harvest storage techniques in fresh tomatoes in Bangladesh. They found that perforated polythene and wet gunny bag treatments showed better physical appearance than all other methods. The score was the highest (10) at 0 days of storage in case of gunny bags. The score was also the highest (8) at 8th day of storage in perforated polythene bags.

The results on storage practice are presented in Table 4. These results indicate that none of the tomato growers properly stored their harvested tomato crop.

Table 4. Post harvest technologies

Storage	Respondents (Nos)	Percent
Followers	0	0
Non-followers	100	100
Total	100	100

Source: Survey Data, 2004

B. MARKETING CHANNEL OF TOMATO

An efficient marketing system is essential for sustained agricultural development. It affects both producer’s income (through prices producers receive for their products) and consumer welfare (through prices consumers pay for agricultural commodities). It can be said that the efficiency of agriculture enterprise depends not only on farm production costs and yields but also on what happens to the farm product after leaving the farm and finally received by the consumers. There are several factors that influence the efficiency of tomato marketing including perish ability, seasonality, quality, prices and location of the products (Kohls and Uhl, 1985). The marketing channel of tomato with reference to the study area is briefly described below:

There are two types of markets that generally exist in agricultural producing areas. These markets are; assembly (local) market and wholesale market. Tomato growers had the option to sell surplus tomato to either or both depending on the level of marketable surplus, better price, marketing cost and convenience; etc. It was found that tomato growers supplied their marketable surplus to both the markets.

I. Assembly market

Assembly (local) markets are often situated close to farm gate generally in a small town and are unorganized where farmers bring the major portion of the marketable surplus. Shopkeepers, traders and retailers are the main buyers in these markets. Most of these transactions involve small quantities of agricultural produce. The shopkeepers and retailers purchase an amount of the product and in turn sell it predominantly to the local consumers in that area. It was found that no assembly market existed in the study area.

II. Wholesale market

Wholesale markets are usually located in a district town or a major sub-divisional town such as Muzaffarabad. This market is the main assembly center for the fruit and vegetable surplus of surrounding areas. Wholesale markets have better storage, transportation, communication and working conditions for both buyers and sellers than those in the assembly markets. In these markets traders who hold an official permit for their activities have built permanent offices and auction floors. Commission agents also provide lodging and boarding facilities to the contractors and producers, who bring their produce from long distances. Market Committee members monitor trade activities in these markets. Traders are required to keep records of their daily transactions and report them to the market committee.

The wholesale market of Muzaffarabad was visited during the field survey to collect tomato prices and to observe the market activities of traders. It was found that growers were the main sellers in this market because they normally supply to the commission agent on some mutual contract. In the wholesale market the major players are commission agent, wholesaler retailer shopkeeper. The commission agents deal in all vegetables and therefore remain busy round the year.

The marketing channel

Agricultural marketing channel is concerned with the concept of ‘marketable’ or ‘marketed’ surplus of farm commodities that enter the process of circulation and exchange. The purpose of exchange of commodities for money and vice-versa is to have access to a variety of products (Baki et al, 1997). Here agricultural marketing channels refer to the

outlets or routes through which commodities pass to reach final consumer. The tomato marketing channel followed in the study area is shown in Figure 1. Private organizations and individuals carry out tomato marketing. The principal agents in the tomato marketing channel were; producer, contractor, commission agent, wholesaler and retailer. The results of the study are discussed below:

1. Producer

Tomato cultivation is carried out by a large number of growers who are geographically dispersed in various locations. It was found that majority of the tomato growers (75%) sold their produce in the local markets and 25 percent took their produce to wholesale market (Figure 1).

2. Commission Agent

The main function of commission agents is to bring buyers and sellers together. They maintain contacts with inter-regional wholesale markets and possess comprehensive and accurate information. The commission agent is the principal intermediary around which all marketing activities rotate. They perform their activities on commission basis and do not accept any title of goods while simply selling the produce brought by producers or contractors. They have establishments in the markets equipped with telephone and other communication facilities. It was found that 25% of total tomato produce was being sold through commission agent.

3. Wholesaler

Wholesalers buy and sell large quantities of farm products. Usually they perform their business in wholesale markets. They deal in several commodities such as fruits; vegetables and other agricultural produce within inter-regional markets and also supply produce to processing industries, exporters and retailers according to their demand. They maintain contacts with commission agents in wholesale markets and retailers in the local area. A wholesaler usually purchases tomato from the commission agent at open auction and sells smaller quantities to the retailers and consumers. They mostly buy from the commission agents on credit basis. It was found that 87% tomato produce was traded by the wholesaler that was received from commission agent in the wholesale market (Figure 1).

4. Retailer

Market activities come to an end with the retailer before the product reaches in the hands of final consumer. They buy and sell small quantities according to the demand of consumers in the area. They maintain direct contact with consumers and make transactions according to the qualitative and quantitative aspects of the products. A small number of tomato retailers occupy small shops in the main vegetable markets or in the town. The majority of

tomato retailers are hawkers, selling from barrows consisting of a wooden platform mounted on four wheels. They move from street to street to offer tomato for sale. Among tomato retailers there is a high degree of competition. Retailers buy (94%) tomato from the wholesaler and sold to consumers. Consumers received rest 6% directly from wholesaler. Similarly, retailer supplied another 13% of market tomato to consumers that he bought directly in the wholesale market (Figure 1).

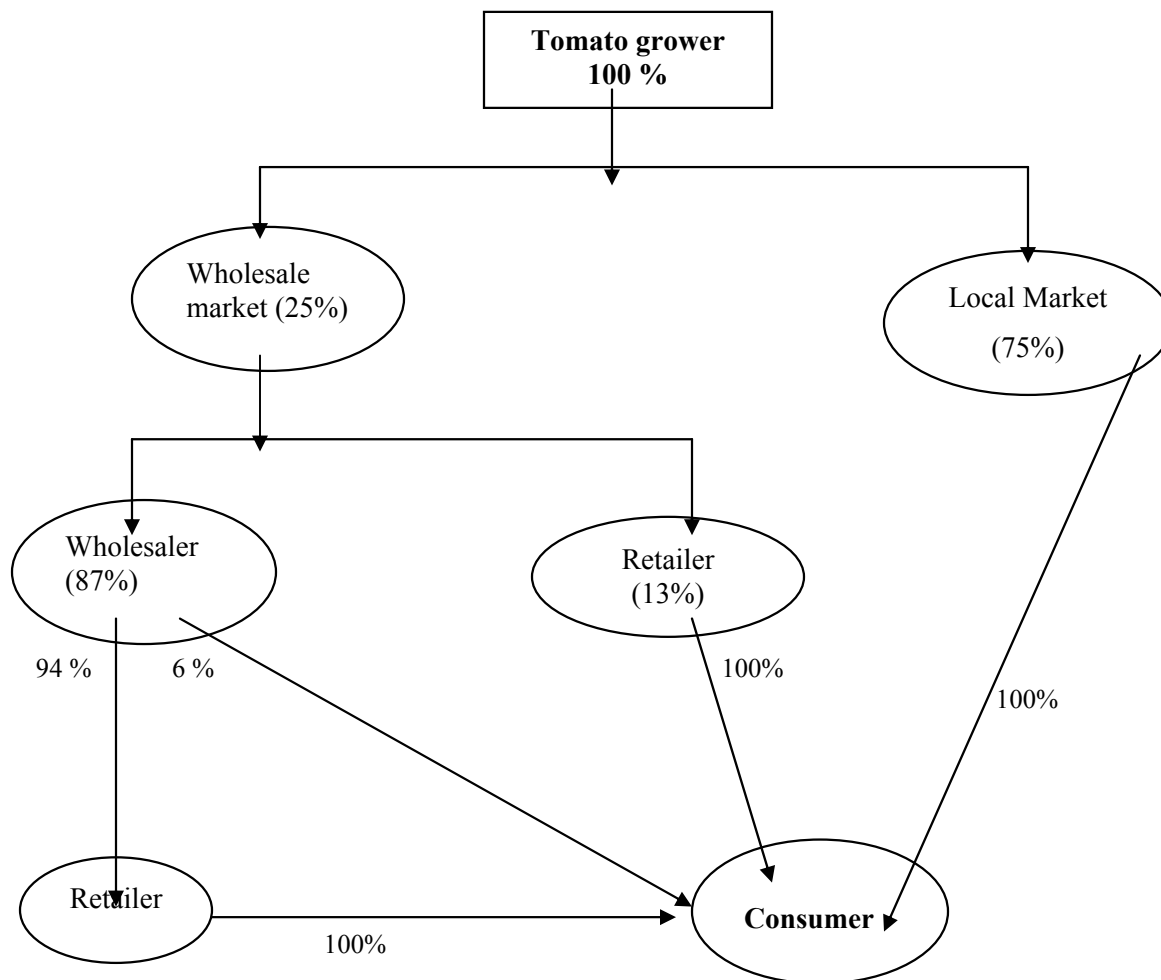
Conclusions and Recommendations

The results presented in the previous parts indicated that:

- 1) tomato growers in the study area were not following post harvest technologies that include; grading, packaging, pre-cooling, storage and transportation. The major reason being is that the growers are not well conversant with these technologies. They are more familiar and inclined towards traditional methods post harvest handling of the produce. It is envisaged that growers could improve their returns in case they avoid post harvest losses to a greater degree by following these technologies
- 2) Bulk of tomato surplus produce was marketed through local market (75%). A small quantity (25%) was marketed through wholesale market. The market margin tends to be lower in the local as compared to the wholesale market

In view of the above it is recommended that:

- 1) tomato growers should be given intensive training related post harvest handling of the produce at government level. Such training should cover improved technologies including grading, packaging, pre-cooling, storage and transportation. This will help in avoiding post harvest losses in tomato leading to an increase in their farm income
- 2) organized regular markets should be developed in the area to provide tomato growers opportunities for getting better market price to increase their returns.



Source: Survey data, 2004

Figure 1. Tomato marketing channel and quantity handled in study area

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