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## **A Preliminary Analysis of the Marketing of Mango in Sindh Province, Pakistan**

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Fruits are an important sub-sector in the agricultural sector of Pakistan. This paper describes the structure and operation of the marketing channels, and quantifies marketing margins of producers and other market agencies.

Survey results show that more than 90 percent of producers sold harvesting rights to their orchards to contractors. The producers' share of the retail price was calculated to be 25 percent. The other shares were 43 percent for contractors, 6 percent for commission agents, 5 percent for wholesalers, and 21 percent for retailers. Other indicators reported here are net profit margins, duration and type of contract, method of contract price determination, mode of payment, and conduct of auctions.

### **INTRODUCTION**

Horticultural crops contribute about 4.0 percent of the GDP and 20 percent of national food production, and annual fruit production is about 3.96 million tonnes. The area of fruit orchards in Pakistan is about 456 thousand hectares [Khan (1994)]. Out of this area, small growers (0.5 to 5 hectares) farm 66 percent, medium growers (5–20 ha) 23 percent, and large growers (over 20 ha) 11 percent. Among the major fruits, mango occupies the second most important position after citrus in terms of area and production: 173 thousand hectares is under citrus, followed by mango (86 thousand hectares), guava (47 thousand hectares) and date palm (42 thousand hectares).

Mango consumers are convinced by its good flavour, delicacy, and nutrient value, and domestic demand is strong. Mango producers tend to increase production due to the sustained and favourable income generated. There is the potential to increase mango exports to many countries, with strong demand for mango products in the Middle East and Europe.

Mango yields in Pakistan are quite low, 8-9 tonnes/ha, which is considerably less than the average world yield of 25 tonnes/ha [Sauco (1993)]. The gap between potential and actual yields is very wide. This yield gap is the result of poor management practices and post-harvest losses. It has been found that the majority of

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growers do not follow the recommendations for an effective use of fertilizer, sprays, and timely irrigation. Post-harvest problems include improper handling, immature fruit harvesting, inadequate transport and storage facilities. Post-harvest losses were estimated at about 20 to 40 percent of the total fruit production in Pakistan [Malik (1994)]. Many orchards in Sindh are also affected by soil waterlogging and salinity.

The objective of this paper is to report preliminary research findings that describe the structure and operation of the mango marketing channels and to quantify the marketing margins of producers and market intermediaries.

### **METHODOLOGY**

This paper is based on primary data collection from a survey of mango producers, market intermediaries, and fruit markets in producing and consumption areas. Sindh province was selected for this study because it is considered to be the main fruit-growing region of Pakistan. In Sindh, mango orchards are particularly located in Hyderabad and Mirpurkhas districts. The taluka of Tando Allahyar in Hyderabad district was purposively selected as a representative study area.

Initially, an informal survey of mango producers and market intermediaries in various markets in the study area was carried out to gain an understanding of the existing fruit marketing system. Open-ended interviews were held with representatives of each category of respondents to identify key issues and variables. Sampling frames for each category of respondents were prepared and interview checklists and general questions were refined. Formal interviews were completed with the following samples: producers 120; contractors 20; commission agents 20; wholesalers 15; retailers 20; and exporters 10 respectively.

### **DESCRIPTION OF THE MANGO MARKETING SYSTEM IN SINDH**

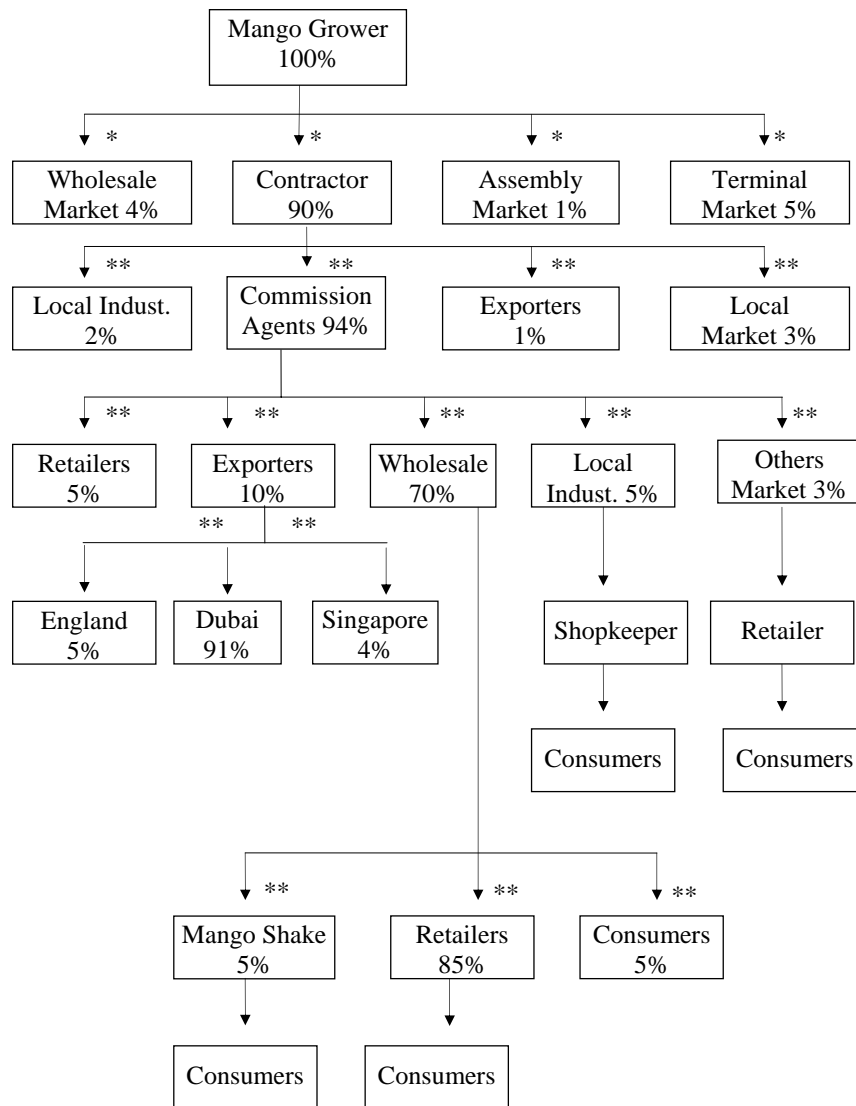
#### **(a) Mango Marketing Channels**

Agricultural marketing channels are 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. Here agricultural marketing channels refer to the outlets or routes through which commodities pass to reach final consumers. The existing mango marketing channels are presented in Fig. 1.

#### **(i) Mango Producer**

A large majority of the mango producers (90 percent) sold the harvesting rights to their orchard to contractors at the flowering stage. Only 10 percent sold their produce directly to market themselves, mainly in the hope of getting better prices. Reasons for the dominance of the contracting system are discussed below.

**Fig. 1. Mango Marketing Channels in Sindh, Pakistan, 1995.**



Source: Survey data, 1995.

\* (Indicate percent of respondent).

\*\* (Indicate percent of volume transacted).

**(ii) Contractor**

The contractor performs a key role in the marketing of fruits. Usually, he maintains a close contact with a commission agent in the wholesale and terminal markets. While contracting an orchard, the contractor estimates its yield and considers the expected costs to be incurred for supervision, labour, transportation, and marketing. After meeting the requirements for own domestic consumption, and payment in kind to the orchard-owners plus pre-harvest and post-harvest losses, contractors had about 89 percent of the produce available for sale in the market.

**(iii) 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. They perform their activities on a commission basis, and do not accept title of goods, when selling the produce brought by producers or contractors. They have establishments at markets, equipped with telephone and other communication facilities.

**(iv) Wholesalers**

Wholesalers buy and sell large quantities of farm products. Usually they perform their business in wholesale and terminal 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. Wholesaler usually purchase fruit from the commission agents at open auction and sell in smaller quantities to the retailers and consumers. They mostly buy from the commission agents on a credit basis, and about one week after selling that quantity, they pay the commission agents. Some wholesalers also act as commission agents.

**(v) Retailer**

All market activities come to an end with the retailers. 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 fruit retailers occupy small shops in the main fruit markets or in the town. The majority of fruit retailers are hawkers, selling from barrows consisting of a wooden platform mounted on four cycle wheels. They move from street to street to offer fruit for sale. Moreover, a number of retailers are found standing at focal places of a town, particularly railway stations, bus stands, vicinity of courts, schools, and hospitals. Among fruit retailers

there is a high degree of competition. Retailers buy fruit from the wholesalers on a 24–48 hour credit basis.

**(b) The Mango Contracting System**

Contracting out harvest of the mango orchard is the most common practice in the study area. Mango fruit is highly perishable in nature and there is also market price fluctuation due to the seasonal concentration of fruit in the market. Therefore, it needs careful handling, quick transport, sound packing and timeliness of all operations if good prices are to be realised.

**(i) Reasons for Using Contractors**

Mango producers usually avoid the marketing of fruit as they do not want to be involved in the complication of the marketing system. Also producers do not want to take the risk of price and income variation due to perishability, qualities, and seasonality. In addition, the most important reason reported by producers in response to an open-ended question is the lack of knowledge of marketing. This needs to be interpreted broadly.

There is a bias on the part of commission agents between producers and contractors. The commission agents do not extend short-term loans to producers to enable them to manage their orchard and to buy inputs and packing material in time. Also, commission agents do not want to transfer market price information to producers or provide other facilities, such as accommodation and telephone access, at the market-place. Therefore, producers have very little information about the marketing of their produce, and face a number of barriers to active participation in the process. It is through these mechanisms and the tying of contractors through provision of loans that commission agents can exert some control over the supply of produce.

Another reason reported by the producers is that they are growing other crops, at the time of harvesting of mango. Completing the wheat harvest and sowing of the cotton crop or other *kharif* crop are the main activities. Therefore, they do not spare enough time for marketing of fruit, and prefer to sell an orchard to a contractor. Finally, out of the sampled respondents, 16 percent of mango producers stated that they decided to contract out the orchard because of the need for a cash advance.

**(ii) Duration of Contract**

The harvesting contract is mostly decided on the basis of mutual understanding between producer and contractor. 60 percent of producers contracted out their orchard for one year, and the remaining 30 percent and 10 percent of producers contracted for a period of two and three years respectively. The contract

amount is decided on a per acre or per tree basis, but normally on a per acre basis. Mango producers lacking capital, especially absentee landlords in a weak financial position, tend to sell their orchard for more than one year. They bargain less on the contract amount, but normally demand a one-year advance payment and thus remain tied to the same contractor for a longer period.

**(iii) Type of Contract**

During the survey it was found that three types of contract are commonly used. The most common method used by 50 percent of mango producers is a contract “without management practices”. In this method, all orchard management costs upto harvest are paid by the producer himself, and all activities are undertaken by him. The contract is normally for one year only and the contractor simply picks and markets the fruit. Another contract includes the cost of “pesticide spray” among the responsibilities of the contractor. In this method, all management costs are borne by the producer except the cost of pesticide spray. Finally, in the third method, contracts include “all management costs”, i.e., ploughing, interculturing, use of inputs like farm yard manure, fertilizer, and pesticide sprays, and are considered to be the responsibilities of the contractor. In this case, the contract is usually of more than two years in duration.

**(iv) Selection of Contractor**

Many contractors approach growers seeking contracts by offering their bids. Producers normally decide on a contract after meeting 5-6 contractors. 52 percent of producers selected the contractor who offered the highest price for their orchard and 38 percent selected contractors who have a good reputation in respect of timely payment. Once a contractor has established his reputation among producers and commission agents, he appears to run his business smoothly with relatively unlimited access to capital.

**(v) Mode of Payment**

Payments depend on the type of contract and the conditions set out during the agreement. The most common method, adopted by 82 percent of contractors, is the payment of one-third of the total contract amount at the time of signing the contract. Although there is no formal legal procedure for signing the contract, a verbal agreement is accepted by both parties and comes into force after payment of the first instalment. The second instalment, again one-third of the total, is paid when half of the crop is harvested, and the final instalment when all the crop is harvested and before it leaves the orchard. Other methods, which are less common, include the payment of a one-year advance, or two instalments in a year.

**(vi) Determination of the Contract Price**

Almost 47 percent of mango orchards were contracted soon after fruit formation. In this case, the contract amount is decided on the basis of the present crop condition. In addition, contracting of orchards continues until August and September. The contract amount is decided in these cases for the coming season. Key factors in determining the contract price are the orchard condition, the experience of last year's production, and the price prevailing in the area.

The survey results showed that 35 percent of producers set prices on the basis of the last year's production and 15 percent sold their orchards to those contractors who offered the highest prices. Moreover, the reputation of the contractor plays a big role in determining the price of the mango orchard. The honesty and fair record of the contractor regarding timely payment of instalments and other conditions set out during the time of agreement contributes to a lower price of contract as compared to that for other contractors.

**(vii) Default in Payment**

Occasionally, growers do not receive the full amount of the contract price agreed. Failure in payments to grower is quite frequent for one reason or another. In particular, adverse weather conditions during harvest offer a reason for contractors to delay payments or reduce the contract amount. The survey results show that more than 20 percent of the contractors defaulted in payment to producers. In 72 percent of these cases the producers agreed to reduce the contract amount keeping in the view the crop production destroyed due to natural hazards.

**(viii) Relationship between Contractor and Commission Agent**

More than 95 percent of contractors obtained loans from a commission agent to pay the initial instalment to the mango producers and to pay an advance for labour and packing material. Once a loan has been extended, the contractor is obliged to supply mango to that commission agent.

There are strong commission agents' associations in each market which maintain strict procedures to control contractors. Commission agents are not allowed to transact with a contractor who is already indebted to another commission agent. In this case, the new commission agent would have to pay all of a contractor's dues to enable him to leave the first agent.

Commission agents mainly distribute credit among contractors during February and March, when the crop is at the flowering stage. As soon as harvest of mango starts, contractors bring their produce for sale to the same agent. The commission agent sells the produce and keeps an account for the contractor. During marketing of produce, the contractor can not obtain the sales revenue from the

commission agent, because he obtained the advance credit. The commission agent only provides the contractor with any further necessary expenses including second and third instalments for orchard owners and payment for labour and packing material.

The contractor normally remains in the orchard during the harvest season to supervise the labour and arrange the transport and packing material. The commission agent, when receiving the produce in the market, is authorised to sell the produce and keep the account for the contractor. At the end of the season, the contractor visits the market and settles the whole season's account with the commission agent.

The commission agent prepares a statement for the contractor of the whole season's arrival and its revenue, minus outstanding advances, market expenses, and commission. Differences with the contractor's own accounts or estimates are reconciled but the contractor will often be in a weak negotiating position if he requires credit for the next season.

Commission charges range between 8 to 12 percent of the sale revenue. The commission varies from contractor to contractor and from contractor to producer. A contractor who has no outstanding advance and can supply a large quantity of produce by contracting many orchards will be in a position to bargain on the commission rate. In contrast, a contractor in debt and without alternative sources of credit will accept a higher commission rate.

If, for example, due to natural hazards, the contractor does not achieve sales sufficient to cover the contract amounts and other management and marketing expenses, then the debt will be carried over to the next season without any interest charges on that amount. In that season the commission agent will again provide advances to the contractor in the expectation of an improved year. Through these arrangements contractors tend to become tied to the same commission agents for a number of years.

The commission agents have the power to control the mango supply through contractors. In the early season they encourage contractors to bring their mango to the market as they can earn higher prices. Whereas in mid-season they encourage the contractor to delay the harvest as they can get a better price in late season. Due to delay in harvest during mid-season, a large portion of the mature fruit tends to be lost, but these losses accrue to the contractors.

### **(c) Mango Auctions**

As soon as the mango reaches the market, the representative of the commission agent receives the truck and takes charge of the crates. Different varieties are stacked in different lots. During this time, the prospective buyers form a circle around the commission agent who opens one sample crate for each lot, and allows the buyers to inspect the top layer of the packed mangoes. At the same time,



the agent utters some publicity slogans in favour of the produce he intends to auction. When the buyers are satisfied with the quality of the fruit, the auction starts. The auction is conducted in two ways: (i) open auction and (ii) secret auction.

**(i) Open Auction**

In an open auction, buyers offer open prices for a lot of mangoes offered for sale. During the market survey, it was observed that open auctions only take place for 'B' and 'C' grade mango quality. The open auction runs from early morning until the new arrival of mango is completed. During the open auction, the producer or contractor can watch the auction and know exactly the price of their produce. In principle, lots could be withdrawn if bids are too low, but it is unusual that a higher price could be achieved before the fruit deteriorates.

In open auctions, the participating buyers are the wholesalers, retailers, and shopkeepers. Price differences were observed based on variety, grading, packing, location, and timing. Early and late mango of any variety received good prices, whereas even top quality mango does not achieve high prices during mid-season. The wholesaler and retailer, after taking delivery of the packed fruit, keep the crates closed in store for about 5 to 7 days till the fruit turns colour but is still firm. Then the fruit is graded according to the size, colour, and appearance and exhibited in the shop. Different grades are offered at different prices.

**(ii) Secret Auction**

In the secret auction, the commission agent covers his hand with a piece of cloth and the buyers touch the hand of the agent and indicate by their touch the price they are ready to pay for the lot. The consignment is sold to the buyer offering the highest price. The secret auction is mainly used for 'Special' and 'A' grade mango quality. These qualities are bought by exporters for export purposes. In the secret auction, the producers and contractors do not know the actual price of their produce, but they must accept the price the commission agent reports. Two main reasons for the secret auction were revealed by the survey.

The first reason reported by the respondents was that most of the commission agents are also engaged in fruit exports. Therefore, the commission agent can buy produce under another name and send that produce for export. The second reason reported was that in the secret auction the commission agent normally retains a 10–20 percent share of the actual price of that produce. Because of the credit-tying arrangements, contractors feel unable to openly object to this system.

### **MARKETING MARGINS ANALYSIS**

Marketing margins are the differences between prices at two market levels and are commonly used to examine the differences between producer and consumer

prices for the same quantity of a commodity. Marketing margins represent the price charged by market agencies for the services provided, including buying, packing, transportation, storage, and processing. Under competitive market conditions, market margins are the result of the demand for marketing services and equal to the minimum cost of services provided plus normal profit [Scarborough and Kydd (1992)].

In order to measure market margins, data on mango prices were obtained at different stages in the marketing chain. It is very difficult to come up with a unique solution for the price to be used. There are many complications in formulating standard prices, which can be summarised as: (a) day-to-day variation of prices, (b) varietal differences, (c) grade differences, (d) price variation over the season, (e) basis for averaging the various grades and varieties, and (f) price differences in consumption and production areas.

Such problems have been resolved by collecting prices which may cover most of the above conditions. The price of mango was collected on a per crate basis; the average weight per crate is about 14-15 kg. Mango prices were collected fortnightly throughout the harvest season from assembly, wholesale, and terminal markets and for different market intermediaries. At the same time, retail prices of mango were collected from the same city from retailers and shopkeepers. Simple averages for the mango price per crate for three time periods and different market intermediaries were calculated.

#### (a) Absolute Cash Margins

It is often believed, particularly by growers, that middlemen in agricultural produce marketing take away a large share of the total profit. To investigate this issue, the absolute cash margins for each market intermediary have been estimated (Table 1). The absolute cash margin or price spread is the difference between the price paid and received by each specific market intermediary.

Table 1

*Market Margins of Mango Producers and Other Market Intermediaries  
(Absolute Cash Margin Rs/Crate and % Share of Retail Price)*

Market Intermediaries	Early Season	Mid Season	Late Season	Whole Season
Producer	70 (28%)	70 (35%)	70 (18%)	70 (25%)
Contractor	98 (39%)	73 (36%)	192 (49%)	121 (43%)
Commission Agent	15 (6%)	12 (6%)	23 (6%)	17 (6%)
Wholesaler	17 (7%)	10 (5%)	15 (4%)	14 (5%)
Retailer	50 (20%)	35 (18%)	90 (23%)	58 (21%)
Retail Price Rs	250	200	390	280

Source: Survey data, 1995.

The absolute cash margin of producers was calculated as the sale price of the orchard per crate harvested by the contractor. The absolute cash margin of contractors is the sale price in the market less this purchase price and sale commission per crate. The absolute margin of commission agents is the commission on sale revenue.

To estimate the margins of wholesalers and retailers was more difficult. The margin varied from one variety to another and from one grade to the next. The figures in Table 1 are simple averages for all varieties and grades. "Look at the difference in the size of the mango in this crate and difference in quality", one wholesaler explained in the Karachi market.

### (b) Net Profit Margin

The production costs of mango producers were estimated at Rs 14 per crate, which includes ploughing, farm-yard manure (FYM), fertilizer, pesticides, and interculturing during the year. The contractor incurred costs of Rs 42 to 53 per crate. This variation occurred due to the variation in commission on mango prices during the season. Commission agents incurred costs of Rs 6.50 per crate. This includes an accountant (*Munshi*), shop rent, telephone bill, and the entertainment of contractors and producers at the market. Wholesalers had costs of Rs 4.65 per crate, and this included transportation of produce from the auction floor to shop, rent, and licence fees. Retailers had costs of Rs 9 per crate, which included transportation of produce from market to sales area and rent of shop or barrow, etc.

The net profit margin of a market intermediary is the net earning gained after paying all costs (Table 2). Mango producers do not benefit from seasonal price variation, because they contract out their orchards at the time of flowering. In contrast, contractors received a maximum price of Rs 139 per crate at the end of the harvest season and a minimum of Rs 31 per crate during mid-season. There is a similar pattern for wholesalers and retailers.

Table 2

*Net Profit Margin of Mango Producer and Other Market Intermediaries  
(Rs/Crate)*

Market Intermediaries	Early Season	Mid Season	Late Season	Whole Season
Producer	56	56	56	56
Contractor	53	31	139	74
Commission Agent	8	6	16	10
Wholesaler	12	5	10	9
Retailer	41	26	81	49

## DISCUSSION

Abid (1980) studied the major fruits, i.e., dates, bananas, and mangoes, in Sindh province and estimated the producer share of the retail price as 20, 15 to 22, and 22 to 24 percent, respectively. Siddiqui (1979) estimated equivalent figures of 27, 15, and 24 percent, respectively.

Memon (1978) quotes figures of 24, 23, and 22 percent, respectively. The economic research unit in Quetta estimated a producer share of 30 percent of the retail price for apples [University of Balochistan (1988)]. Muhy-ud-din (1991) estimated a producer share of 40 percent for citrus in Punjab.

Swarup (1985) ascertained the producer share in Himachal apple cultivation in India. He concluded that the producer share did not increase despite a sharp increase in apple prices. Results showed that producers received 46 and 48 percent of the retail price in Amritsar market during 1975 and 1984 respectively.

The results here are thus consistent with other similar research in the region. Assessment of whether or not the values found for the indicators presented here show definitively that the marketing system is fair and efficient is, however, a difficult exercise and beyond the scope of this paper.

In general, it has been observed that there is competition at each market stage. No strong evidence was found of collusion among agencies, with prices at each stage normally set by supply and demand factors; whilst spread of information regarding quantity and price is fast and rapid amongst all agencies other than producers.

Timely and accurate availability of market information is important since any improvements in the quality and dissemination of market information should, in theory, improve both operational and pricing efficiency. The main sources of market information for mango producers are commission agents, transporters, contractors, and neighbouring growers. The information received was often inaccurate, misleading, delayed, and without uniform distribution among producers. There is no effective dissemination of market information among producers that can help them decide the best time to bring their produce to the market.

There are no fixed criteria for entry and exit as a contractor. Anyone who has contact with a commission agent and is able to receive advances for contracting the orchard could enter the business. However, it was observed that the majority of contractors belong to the interior area of Sindh, and are associated with the farming community. This may be essential to gain acceptance from land-owners.

In contrast, for commission agents and wholesalers, there are many barriers to entry in the business. Lack of space in the market is one of the most important elements because shops and auction floors are fully occupied and tend to remain occupied by the same family for a long time. It was also observed that certain ethnic groups dominate and may restrict the entry of other groups, especially in wholesale

and terminal markets. Finally, a large initial investment is required, particularly for a commission agent. A successful commission agent must have a strong relationship with contractors, and sufficient capital to invest in the seasonal advances.

In general, other studies of fruit marketing systems in Pakistan have taken the relatively low marketing margins of producers as an indicator of non-competitive and exploitative market systems that favour traders. Here contractors have been found to receive the highest margins in the marketing of mango in Sindh, but this may reflect their relatively high and unpredictable costs, and the fact that they bear the most risk. Apart from variation in yield and post-harvest losses, risk also arises from transport problems, variation in the price of packing material, management of labour, and the unregulated behaviour of commission agents. Whilst producers can potentially achieve higher returns by marketing mango themselves, they may prefer a lower but less risky income paid partly in advance, particularly when account is taken of the opportunity cost of the management input required for fruit picking and marketing.

Commission agents obtain a relatively low margin per unit volume of mango but are transacting large volumes over each season. Their main risk is non-recovery of loans which are advanced to secure a reliable and controllable supply rather than to generate profit from the credit transaction itself. Higher profits may arise from the practice of 'secret auctions' and the combination of wholesale or export businesses with their role of commission agent.

The main risks for wholesalers and retailers are price variation and the failure to sell perishable produce in time. Also, while wholesalers generally grade and re-pack, their stock retailers have less opportunity to ascertain the quality of lower layers of fruit in the crates purchased. The degree of competition apparent between wholesalers, and particularly retailers, suggests that their market margins are not excessive.

## **CONCLUSION**

Further investigation is required before definitive judgements can be made about the efficiency of the marketing system in Sindh. Analysis is needed of the transaction costs and risks for producers and market intermediaries in an environment of poor transport and communications infrastructure, poor security, a dysfunctional legal system for the enforcement of agreements, and widespread public sector corruption. Given such an environment, it is, however, simplistic and unrealistic to conclude that the relatively low share of the retail price received by producers is the result of monopsonistic or exploitative behaviour by traders, as has tended to be the trend in past studies.

The fact that ninety percent of producers sell the harvesting rights to their orchards to contractors indicates that the contract system provides economic advantages to them. On the other hand, it is also apparent that producers face great

difficulties in marketing their own produce. In assembly, and particularly in wholesale markets, they are treated as temporary clients without access to the credit and other facilities extended to contractors. Without adequate access to market information, they also face high price uncertainties. Lack of capital and limited access to institutional credit lead producers to rely on relatively high-cost informal credit sources and advances from fruit contractors.

In the current environment, it is difficult to recommend feasible means to improve the efficiency of the fruit marketing system in Sindh. Public investment in infrastructure is justifiable to reduce transactions costs and risks. Encouraging at least some entrepreneurial producers to market their own output would introduce more competition into the first stage of the marketing chain and help ensure that the margins gained by contractors are not excessive. This requires improvement of access to credit at the mango flowering stage to finance an improved use of inputs in orchards and the working capital for labour and packing material. It also requires dissemination of the market price information through mass media.

Improved access to alternative sources of credit for both producers and contractors, as well as effective legislation to outlaw 'secret auctions', would also improve their bargaining position in dealing with commission agents, helping to reduce the dominant market position of the latter.

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