

PN-1211-875
97 94604

MARKETING OF PANJGUR FRUITS

Prepared For:

LOUIS BERGER INTERNATIONAL, INC.
BALAD PROJECT
TURBAT

Prepared by:

K.A. Siddiqi
F.G. Masson

BEST AVAILABLE DOCUMENT

November 5, 1991

Table of Contents

	<u>Page</u>
Executive Summary	i.
I. Production of Fruit in the Panjgur District	1.
A. The Panjgur District in Perspective	1.
B. Area Under Cultivation and Expansion Potential	2.
C. Land Tenure	4.
D. Cultural Practices	4.
E. Climatic Contrasts and Their Implications	6.
II. Marketing of Specific Commodities	10.
A. Grapes	10.
1. Grapes in Perspective	10.
2. Marketing of Grapes From Panjgur	12.
<u>Grape Marketing in Panjgur District</u>	12.
<u>Grape Marketing in Turbat</u>	12.
<u>Grape Marketing in Quetta</u>	13.
<u>Grape Marketing in Karachi</u>	16.
B. Pomegranates	23.
1. Pomegranates in Perspective	23.
2. Marketing of Pomegranates From Panjgur	26.
<u>Marketing of Pomegranates in Panjgur District</u>	26.
<u>Marketing of Pomegranates in Turbat</u>	26.
<u>Marketing of Pomegranates in Karachi</u>	26.
III. Market Potential for Fruits Now Produced, or Which Could be Produced in Panjgur	32.
1. Market Potential for Panjgur Grapes	32.
2. Market Potential for Panjgur Raisins	33.
3. Market Potential for Panjgur Pomegranates	37.
4. Market Potential for Panjgur Figs	38.
IV. Conclusions	40.
V. Action Plan	43.
ANNEX I: Grape Culture	47.
ANNEX II: Fig Culture	52.
ANNEX III: Pomegranate Culture	56.
ANNEX IV: Fruit Drying Practices	57.
ANNEX V: List of Members, All Pakistan Fruit & Vegetable Exporters, Imports & Merchants Association	59.
ANNEX VI: Marketing Costs & Margins, Quetta to Karachi	66.
ANNEX VII: Marketing Costs & Margins, Quambrani to Quetta	67.

EXECUTIVE SUMMARY

The Consultants were asked to examine the marketing potential of several fresh fruits grown in the Panjgur District of Makran Division of Balochistan. The study took six weeks in October and November of 1991. This study describes the market potential for the most promising crops, draws conclusions about the future of fruit marketing in the district, and presents an action plan for the expansion of production and increase in marketing of those crops.

Market Potential for Panjgur Grapes

Nearly all of the grapes grown in Panjgur District are consumed locally or in the Makran. Prices in Panjgur depend on demand from outside the District, principally at Turbat which absorbs 55% of total cash sales. There appears to be no further expansion potential for cash sales of grapes in Panjgur District.

At Turbat, grape prices are fairly constant between July and early September then dropping significantly when the crop from Iran and Afghanistan begins to arrive. Unless income in Turbat rises substantially in the near future, it seems unlikely that the Turbat market for grapes from Panjgur will grow to any extent. There is even less likelihood for expansion of grape sales from Panjgur in other areas of the Makran. Panjgur grape merchants must find new markets if sales are to grow.

There is a very large market for fresh grapes in Karachi, even for the seeded varieties produced in Panjgur, which offers much higher marketing margins to contractors/merchants than are available in the Makran. These are detailed in Chapter II. Contractors and merchants in Panjgur have just begun to take advantage of the Karachi market. So far, penetration of the Karachi market from Panjgur has not been achieved in any systematic fashion.

Very few merchants either in Panjgur or in Karachi are aware that Panjgur grapes are available 1 1/2 months earlier than those arriving from the Quetta area. These early grapes would command considerably higher prices (merchants interviewed there stated that July grapes could be sold for at least 1/3 more than those arriving in August). There is no evidence that the Panjgur merchants have capitalized on this fact, or attempted to profit from the much higher margins obtainable in Karachi, especially early in the season when grapes are available there from no other source.

Panjgur merchants need to place one of their own people at this time in the Karachi auction market. From increased revenues from sales in Karachi, the Panjgur grape growers and contractors could easily earn the cost of keeping an agent in Karachi to direct

grapes there, especially early in the marketing season. He could make contact with market actors in Karachi and seek markets for other commodities from Panjgur.

B. Market Potential for Panjgur Raisins

Dates, grapes and pomegranates are the only commercial fruit crops grown in Panjgur District. The resistance of growers to alter cultural practices, and of merchants to find access to major markets for these crops sharply restrict markets for existing production. Meanwhile, land development programs resulting from increased water supply are bringing new areas under cultivation. With limited market outlets, if these new lands are planted in grapes of the varieties now grown, major marketing problems for fresh fruit appear inevitable.

One solution lies in introducing technologies for dehydrating grapes to convert them into raisins. Grape dehydration is not a complicated process. The establishment of cottage industries for this purpose is a feasible solution to Panjgur District's looming grape marketing problem because Pakistan is currently importing substantial quantities of raisins.

Raisins sell for higher prices than fresh fruit. Marketing costs and margins lend strength to the recommendation to introduce preparation of raisins in Panjgur District.

Agricultural extension staff should be advised and trained to provide guidance to growers to introduce seedless varieties of white grapes which command price premiums not only as fresh fruit but also as raisins. Seedless black grapes can also be introduced profitably since raisins produced from them have domestic and international markets for bakeries and household use.

C. Market Potential for Panjgur Pomegranates

Consumers of pomegranates in Turbat, and probably throughout the Makran, currently appear to be rather indifferent to quality. Prices of pomegranates in Turbat do not change regardless of qualities and quantities available from other sources. The markets in Turbat and elsewhere in the Makran seem to be able to absorb a portion of the fresh pomegranates of low quality which are now produced in the Panjgur District.

But Karachi consumers are more discriminating than those in the Makran. Also because of greater competition from other areas, the Karachi market for fresh pomegranates from Panjgur does not appear to offer much promise for expansion.

With limited possibilities for market expansion in the Makran and lack of demand elsewhere, one possibility for market expansion is to improve the quality of the fruit by grafting improved

varieties on existing trees. An alternative solution is dehydration of pomegranates for sale as anardana. Dried pomegranate (anardana) is widely used in production of sauces and curries. Production of anardana could be expanded.

D. Market Potential for Panjgur Figs

Despite the ease of growing figs in Panjgur, total local production is not more than 5-7 tons. No fresh figs are currently marketed outside Panjgur District.

Figs are expensive to package for the fresh market, even though some consumers in Karachi would pay the necessary price to obtain fresh figs of good quality. The proposed Panjgur grape agent might develop a market for fresh figs if they are properly packaged to arrive in good condition.

There is also a growing market for dried figs in Pakistan. Harvest in Panjgur commences about two months earlier than other areas of Pakistan.

Growers in Panjgur District could undertake growing and drying of figs, since the climate of the area is suitable for this purpose. Grower prices are attractive and production of high-quality figs suitable for drying is easily learned. The fig has the advantages of easy propagation of trees, rapid development to bearing and production of two crops each year. Drying can be performed as a cottage industry (Annex IV). Thus expansion of fig production in Panjgur rates the highest priority at this time, for sale as both fresh and dried fruit.

Conclusions:

The preceding recommendations are likely to improve the economic conditions of the people of Panjgur District by developing new labor-intensive activities. These will take the form of:

- (a) Improvement of cultural practices,
- (b) Introduction of new and improved varieties of existing crops,
- (c) Diversification of horticultural crops,
- (d) Establishment of cottage industries which do not now exist.

These potential gains can be accelerated by:

- (a) Expanding existing research efforts,
- (b) Effecting a major reorientation of the Agricultural Extension Service,
- (c) Enforcing the Agricultural Produce Markets Act in the Province of Balochistan.

Action Plan:

An action plan to improve the marketing of fresh fruit from Panjgur District is presented in Chapter V. This action plan addresses three major aspects of marketing: Crop Production, Post Harvest Technologies and the Marketing Process itself. Recommended interventions are listed under what can be done in the short-term, the medium-term and long-term.

Implementation of programs to improve the situation of Panjgur farmers will require a large amount of work by National and Provincial research centers, local agricultural extension services and marketing sections. The existing organizations are not equipped or oriented at this time to implement the programs outlined above. Projects by foreign donors are not now directed at any of the steps necessary to improve the incomes of Panjgur's farmers and must become involved in them. The authors of this report hope that the information presented here may orient national and donor efforts to develop suitable projects and programs.

PRODUCTION OF FRUIT IN THE PANJGUR DISTRICT

A. The Panjgur District in Perspective

The climatic conditions in Pakistan and the range of altitude in the country from sea-level to over 8,000 meters elevation makes it possible to grow both tropical and temperate-climate fruits. In 1988/89, the country produced 3.8 million tons of fruits of all kinds. By provinces, overall fruit production was as follows:

Table 1. Fruit Production by Province

	<u>Million Tons</u>
Punjab	2.5
Sind	0.6
Balochistan	0.4
NWFP	0.3.

In Balochistan, apples account for 1/3 of fruits produced, excluding dates. Other major fruits include apricots, grapes, almonds, pomegranates, plums and peaches. Fruits produced in small quantities are mangos, citrus, guava, bananas, figs and pears. Fruit production in Balochistan in 1988/89 was as follows:

Table 2. Fruit Production in Balochistan

	<u>Thousand Tons</u>
Apples	110.7
Dates	86.2
Apricots	56.3
Grapes	31.0
Almonds	29.4
Pomegranates	24.5
Plums	16.1
Peaches	13.5
Minor Fruits	23.3.

The Makran Division of Balochistan is important largely for production of dates, pomegranates, citrus and grapes. The Makran also produces small quantities of guava, peaches, plums and figs.

Official production data for the Makran in 1988/89 were as follows:

Table 3. Fruit Production in the Makran

	<u>Thousand Tons</u>
Dates	63.9
Pomegranates	3.2 ¹
Citrus (lime and turanj)	2.0
Grapes	0.5 ²
Guava	0.3

Items of economic importance in the Panjgur District are dates, pomegranates, and grapes. (For more comprehensive data on the latter two crops, see Chapter II - Marketing of Specific Commodities; for information on date production in the Makran, see Irani, M.M. and F.G. Masson Marketing Makran Dates, BALAD Project, 1991). Minor quantities of citrus, apples and figs are also produced in Panjgur. There are no published data on production of these minor crops in Panjgur.

B. Area Under Cultivation and Expansion Potential

In Panjgur, rainfall is low, averaging less than 4.5 mm./year since 1970 and highly irregular from year to year.³ Thus cultivation of fruit crops is limited to parts of the Gichk and Rakhshan valleys in Panjgur District. The Rakhshan river drains 12,690 km² and flows intermittently.

No reliable data are available on overall surface or ground water availabilities in Panjgur District. A 1983 study by WAPDA states that there are 27 cusecs of ground water available for exploitation in the Rakhshan River basin. However, since 1983 there has been a significant increase in pumping from wells since 1983 and therefore these studies need to be reassessed or, better yet, redone.

¹ Production in Panjgur in 1988/89 was 2.6 thousand tons. Turbat accounted for the remainder of the production of pomegranates in the Makran.

² Of this total, Turbat accounts for 60 tons. Unofficial data gathered by the authors in October 1991 suggest that production in Panjgur has expanded rapidly over the past three years and is currently of the order of 800 tons.

³ Water Sector Interim Report BALAD Project, February 1989, Figure 6, "Rainfall Panjgur".

Within the irrigated areas, khushkabas (bunded surface water diversion works), korjos (open ditches dug into the stream bed to the subsurface flow and carrying water to the command area), karezes (tunnels carrying water from wells to the command area) and wells equipped with engine-powered pumps are used. Some tubewells have recently been drilled. These irrigation techniques are often employed in combination on the same property, but khushkabas are used primarily for cereal and fodder rather than fruit crops.

The Balochistan Agriculture Department lists a grand total of 2,853 hectares under irrigation in Panjgur District in 1988/89, of which 2,000 were planted in fruits. But it provides no information concerning the sources of the water used for irrigation. More recent data have been developed by the BALAD Project. The Project has counted 117 active karezes in Panjgur District and 30 active korjos, with a total combined command area of 2319 hectares. The source cited states that:

"In other areas there appear to be certain confined aquifers or underground pools of water shallow enough to be mechanically pumped by wells. The size, productivity [and present command areas of wells tapping] these aquifers are largely unknown."

BALAD lists the number of active agricultural wells, karezes and korjos in Panjgur District as follows:

Figure 4. Wells, Karezes and Korjos in Panjgur Dist.

	<u>Wells</u>	<u>Karezes</u>	<u>Korjos</u>
Panjgur area	28	96	26
Gichk area	17	10	2
Gwarko area	0	4	2
Paroom area	49	7	0.

Official reports on the characteristics of soils in the Makran do not contain information specific to the Panjgur area. In general, it can be said that all the soils used for irrigated cropland are in the river valleys and/or alluvial plains. They range from very silty in texture to gravelly. Being of alluvial origin, these soils are extremely fertile and productive. They have a high pH (around 8.0), and salts on the soil surface are evident in some areas around Panjgur. But salt build-up apparently has not so far affected yields in Panjgur District.

⁴ M. Yahya Khan and Bradbury, D.M. Karez and Well Inventory of the Makran, 1991.

Without adequate baseline data or a basis for developing reliable projections it is impossible at this time to determine the potential for expansion of the area of fruit production in Panjgur District. But as indicated in Section 4 below and in Chapter IV - Action Plan, there is considerable scope for increased production as a result of improved cultural practices.

C. Land Tenure

In the areas of Panjgur District irrigated by karezes, korjos and bunds, small land holdings ranging from less than 0.1 to about 3 hectares are normal. There are two main reasons behind the small land holdings in these areas. For karezes, korjos and bunds, construction and maintenance costs are very high. Therefore many contributors, sometimes as many as 100, are required for each of them. Each karez or korjo on which we have some information, on average commands an average of only 15 hectares.

Second, many of these constructions were completed generations ago. Thus the irrigated land shares (small to begin with) have been further fragmented by inheritance. Even the richest landlords, of which there are perhaps a dozen in the area, rarely command more than 5 hectares of irrigated land.

Because of severe shortage of skilled agricultural labor in the area, even the owners of economically-viable holdings tend to work on the land themselves or employ day laborers to perform specific jobs under their supervision.⁵ Another common practice is to utilize contractors for harvesting and packing of fruits (see Chapter II - Marketing of Specific Commodities).

D. Cultural Practices

Individual farms in the area show a mixture of field and fruit crops on the same holding. Exclusive production of an individual crop is an exception. Date palms are planted around the periphery of the field with fodder and sometimes cereals within. Pomegranates and other tree fruits are intercropped. Grape arbors tend to be small -- from five to fifteen vines at one site.

⁵ For detailed information on the land tenure system and farm labor employment, see Buzdar, Nek Socio-Economic Survey of the Makran Division of Baluchistan BALAD Project 1987.

This cropping pattern causes a number of problems with regard to fruit culture.

Intercropping requires that each farm operator be expert in a variety of fruit trees with quite different requirements concerning year-round management;

It can interfere with natural or artificial pollination-- either the required insects are not attracted by the small number of trees, or they cannot make their way from tree to tree in order to pollinate each flower at the proper time;

It hampers efficient pest management, both because pests are often specific to only one fruit and must be combatted by determined methods at specified times; and because the expense of using pesticides will be largely wasted if all of the same crop in the vicinity is not also treated at the same time; and

Lack of control over water supply (except when water is available from "tubewells" whence it can be applied as needed) vastly complicates water management, even if intercropping were not prevalent.

No farmer interviewed had used pesticides during the previous year although the local Agricultural Extension Department had pesticides as well as spraying equipment available and supposedly was prepared to provide services for nominal charges. BALAD has repaired all of their power sprayers that were repairable, procured 35 knapsack and canister sprayers which were turned over to the Department over a year ago.,

Farmers, however, complained that the services requested were neither timely nor appropriate as regards the agricultural chemicals applied. Fertilizers are also sold by the Extension Department; but in this regard also there were complaints as to their prices, availability and timeliness. Absence of pesticide control equipment and chemicals in the local market prevents farmers from performing their own pest control.

It is thus not surprising that cultural practices in the area are obsolete, resulting in low yields, especially of tree and vine fruits. For example, in the case of pomegranates improper water management and lack of pest control results in low yields because of splitting of the fruit and fruit rot due to insect infestation. Grape vines tend to be overgrown; and vine and bunch pruning has only recently been introduced in order to increase fruit size and yield (see Chapter IV - Action Plan). The vines are trained on such low arbors that the fruit is difficult to check as to maturity and cumbersome to harvest.

E. Climatic Contrasts and Their Implications

A review of meteorological observations since 1989 at Quetta and Panjgur reveals higher temperatures in Panjgur throughout the year. Over the first six months of that year, the maximum at Panjgur averaged 7° higher than at Quetta. The monthly minimum temperature was 11.1° lower at Quetta. This pattern has been typical over the past three years (see charts on monthly maximum and minimum temperatures at these sites, pp. 7, 8 and 9).

Thus earlier harvests in Panjgur, by as much as 1 1/2 months in the case of grapes, are normal. The frost-free season in Panjgur extends for 270 days or more. There are a sufficient number of cold days in Panjgur to permit the dormancy periods required by some temperate-climate tree and vine crops. For example, most of the high-yielding varieties of grapes, both seeded and seedless, grown in hot climates in North America, could be introduced there, either by planting new vines or by top-working the existing ones (see Annex I - Grape Culture). This climate is ideal for such crops as persimmons, kiwi fruit and figs (see Annex II - Fig Culture). High-quality pomegranates cannot be grown in Panjgur (see Annex III - Pomegranate Culture).

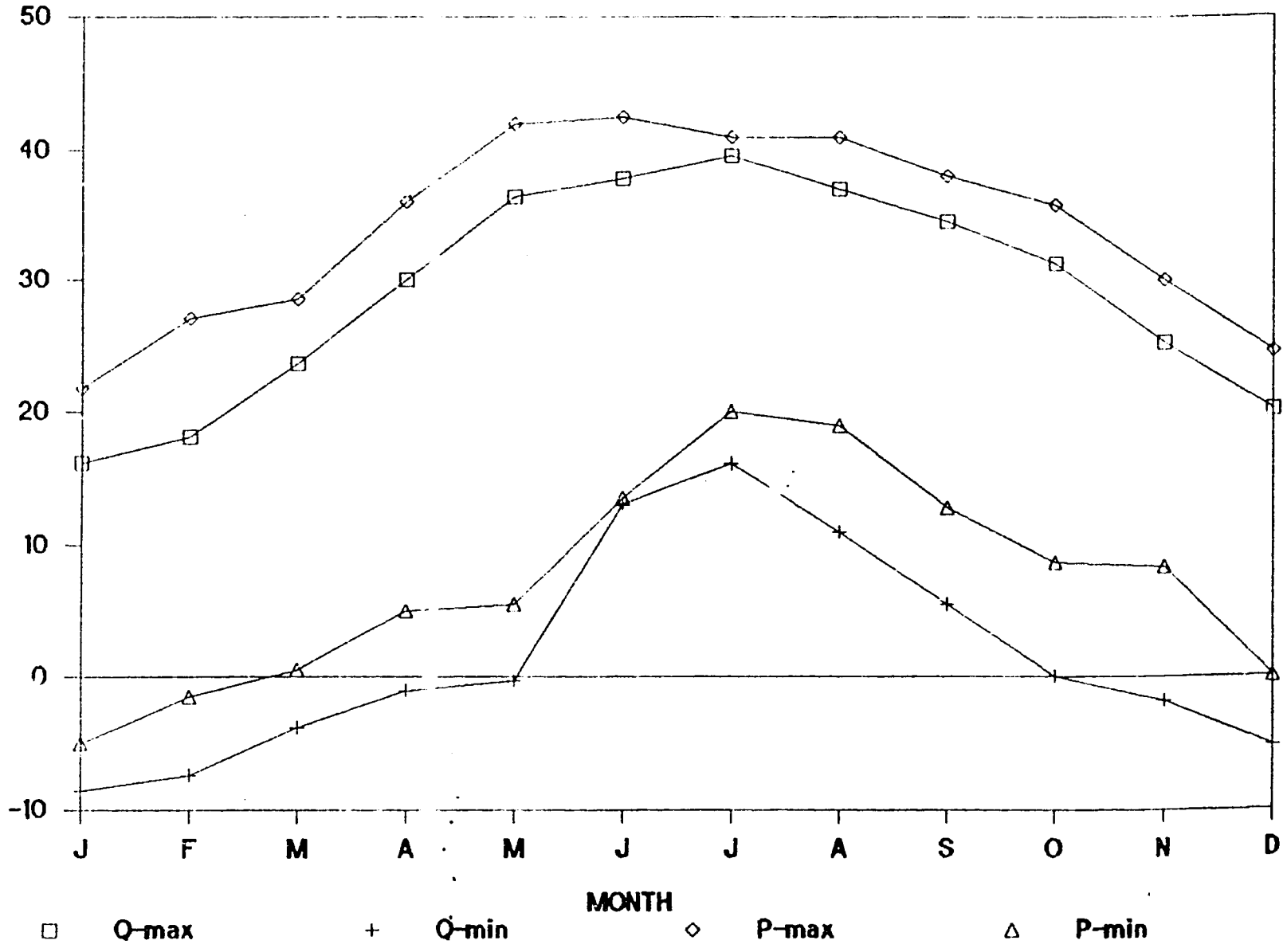
But in some years, e.g., 1990, only a few hours below 2° C were recorded at Panjgur. Lower temperatures for an extended period are required to induce dormancy and permit many temperate-climate fruit trees to have a seasonal cycle and bear normally. Thus such crops as cherries, pears, apricots, and most plums, peaches, and commercially-valuable varieties of apples, could not be grown in the Panjgur District because they require a much greater number of cold units than are recorded there.

However, freezing temperatures occur each year at Panjgur. Most citrus fruits, such as oranges, tangerines and grapefruit, would be severely damaged or destroyed by freezing.

⁶ Texas A. & M. University has recently developed a peach cultivar which requires only a few hundred cold units. We do not know whether it would be suitable for the climate in Panjgur, or whether it would be saleable in Pakistan. For possible sources of information on this, see Annex II.

MONTHLY MAXIMUM & MINIMUM TEMPERATURES

QUETTA AND PANJGUR - 1989

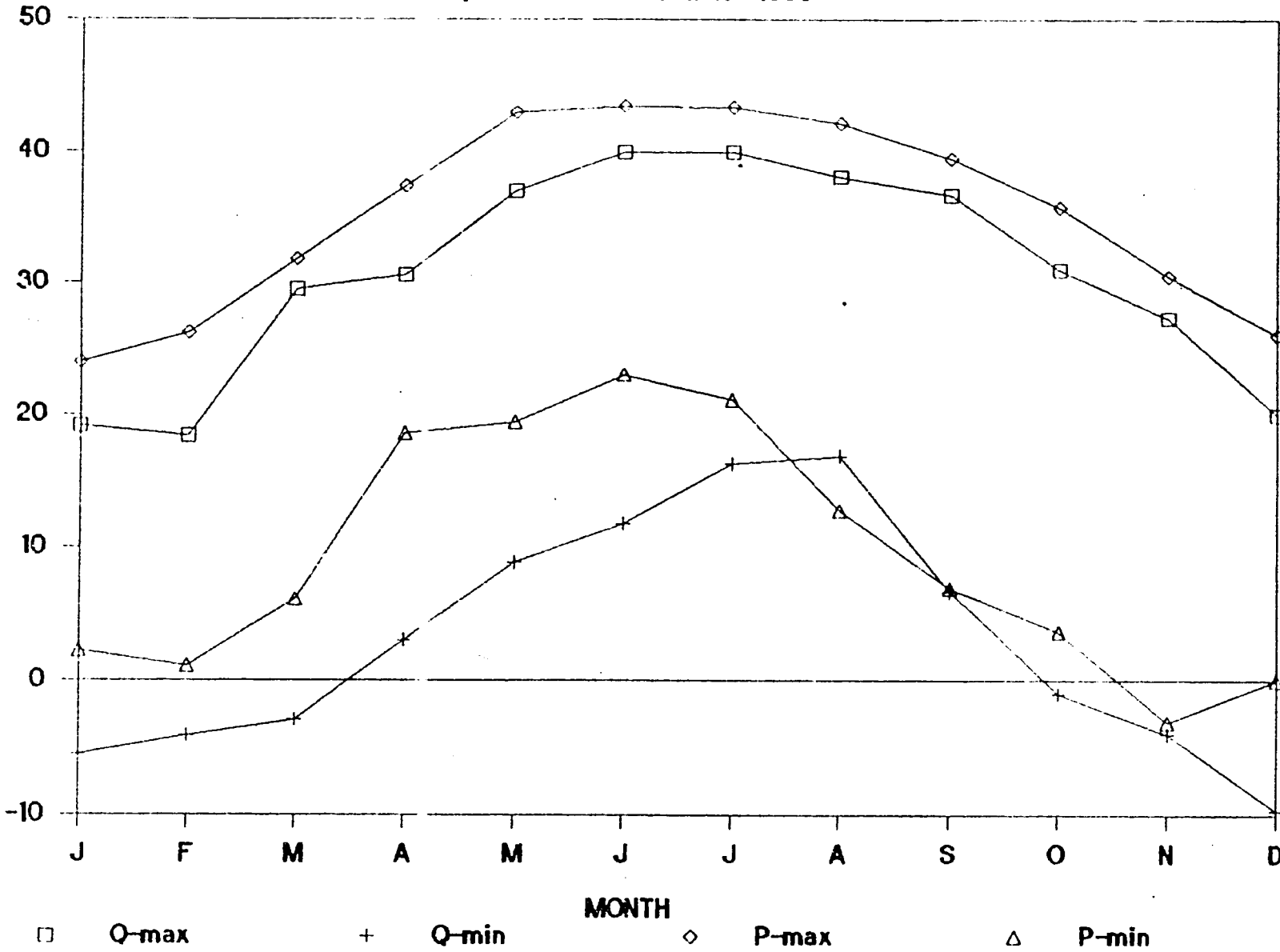


DEGREES CENTIGRADE

BEST AVAILABLE DOCUMENT

MONTHLY MAXIMUM & MINIMUM TEMPERATURES

QUETTA AND PANJGUR - 1990



DEGREES CENTIGRADE

BEST AVAILABLE DOCUMENT

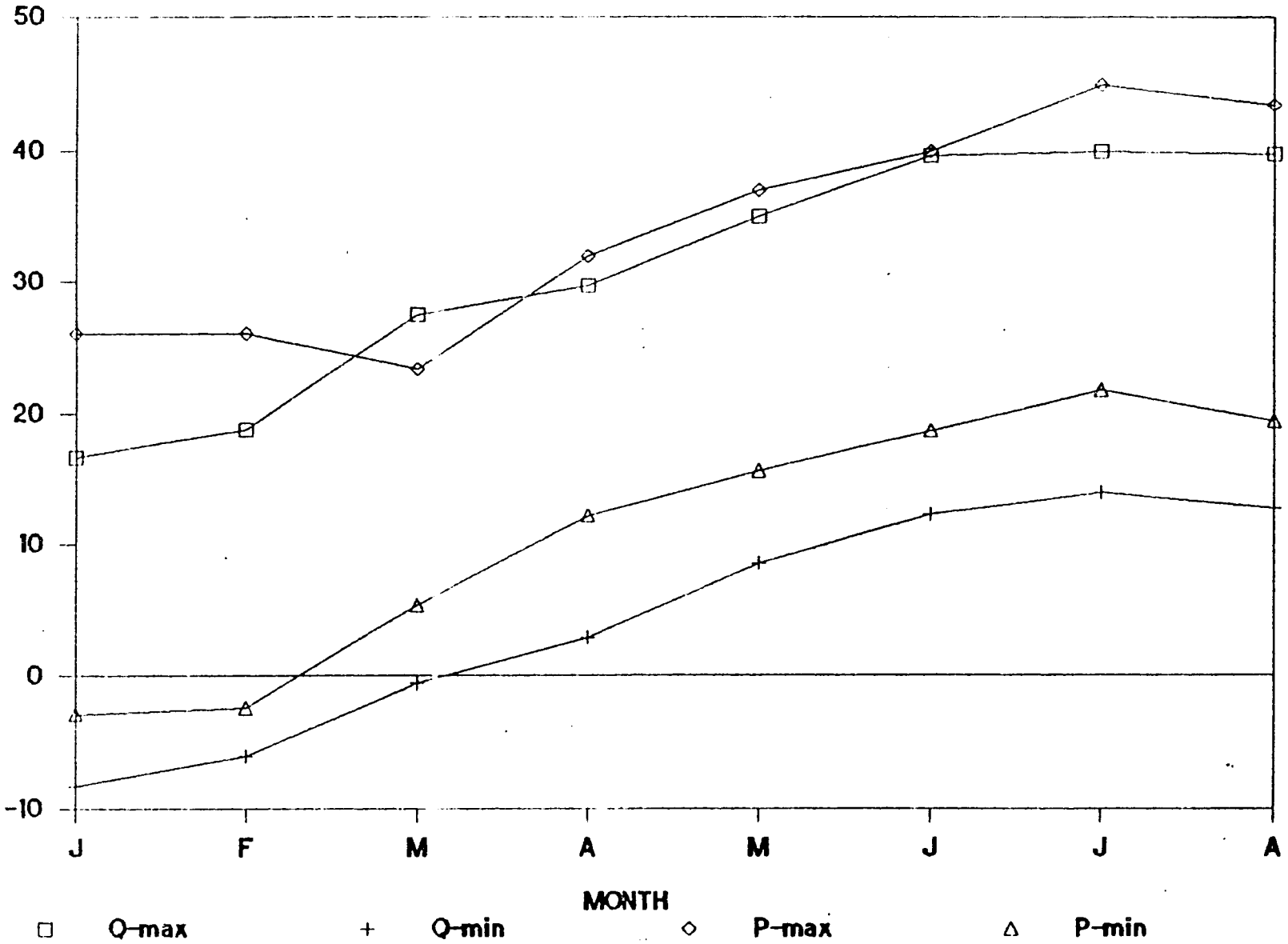
MONTHLY MAXIMUM & MINIMUM TEMPERATURES

QUETTA AND PANJGUR - 1991

DEGREES CENTIGRADE

6

BEST AVAILABLE DOCUMENT



□ Q-max + Q-min ◇ P-max △ P-min

II. MARKETING OF SPECIFIC COMMODITIES

A. Grapes

1. Grapes in Perspective

Production

In Pakistan, official statistics indicate that virtually all grapes produced originate in Balochistan. National production of grapes grew very slowly (2.4% annually) between 1985/86 and 1989/90.

Table 5. Pakistan Grape Production 1986/87

<u>Crop Year</u>	<u>Pakistan</u>	<u>Balochistan</u>
	(Tons)	
1985/86	29,600	28,300
1986/87	29,500	29,300
1987/88	30,500	30,300
1988/89	31,300	31,000
1989/90	32,600	31,700.

Source: Ministry of Food, Agriculture and Cooperatives, Agricultural Statistics of Pakistan

The Makran Division of Balochistan accounts for a minor share of overall production. Panjgur District accounts for all of this. The official data for 1986/87 are as follows:

Table 6. Balochistan Grape Production 1986/87

	<u>Tons</u>
Quetta Division	
Quetta District	7550
Pishin District	11890
Loralai Division	
Zhub District	3460
Kalat Division	
Kalat District	3230
Makran Division	
Panjgur District	430

Source: Ministry of Agriculture, Balochistan Province
Production in Panjgur District

Production Within Panjgur District

Within Panjgur District, there are currently some 150 commercial producers of grapes and a much larger number of minor producers who add small quantities to total marketable product.

There are twelve Union Councils in Panjgur District, of which six are important areas of grape production. These are:

Table 7. Panjgur District Grape Production

	<u>Tons</u>	<u>Percent</u>
Sari Koran	195	23
Sordo	117	15
Washbood	117	15
Gramkan	125	16
Khudabadan	132	16
Tasp	94	12
Other Union Councils	<u>20</u>	<u>3</u>
Total	800	100.

Only three varieties of grapes are grown in Panjgur District. They are locally known as Sabzu (green long seeded), Bagi, or Safed (light green round seeded -- Bagi is translated as "white"), and Kalo (black). Our estimate of production of these varieties in 1991 is as follows:

Table 8. 1991 Panjgur Grape Production by Variety

	<u>Tons</u>	<u>Percent</u>
Sabzu	480	60
Bagi	160	20
Kalo	<u>160</u>	<u>20</u>
Total	800	100.

These varieties are harvested at the following times:

Season	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>
	(Percent)			
Bagi early July-end October	30	35	30	5
Sabzu mid July-end October	25	25	35	15
Kalo third wk. July-end Oct.	20	30	40	10

Consumption

By provinces, estimated annual consumption in 1987/88 was as follows:

Table 9. Pakistan Grape Consumption by Province 1987/88

	<u>Tons</u>
Balochistan	3456
Sind	9136
Punjab	15248
NWFP	<u>3536</u>
Total	31376

Source: Federal Bureau of Statistics, Household Income and Expenditure Survey, 1987/88. Population figures are from the 1981 Census, extrapolated to 1987/88.

Foreign Trade

No exports of fresh grapes from Pakistan are recorded in the official statistics. Imports during 1989/90 and 1990/91 are shown Table 10. (following page). In the former period, these accounted for 4071 tons, about 11% of apparent consumption. By extrapolating the growth in domestic production over the past five years, one can conclude that the share of imports almost doubled between 1989/90 and 1990/91. According to the official statistics, Afghanistan is the major source of supply, followed by China and India. No imports are shown from Iran, although Iranian grapes are a significant source of supply, not only within Panjgur's major marketing areas in the Makran, but also in other markets of Pakistan (see Table 1).

Pakistan imposes an import tariff of 100% on all fresh and dried fruits. In the case of imports from Afghanistan, the import duty is only 37.5%.

2. Marketing of Grapes From Panjgur

Primary assembly of grapes originating in Panjgur is performed by contractors, of which there are at least fifty who purchase the standing crop, undertake its harvest and packing and transport the grapes to other sites. This market channel accounts for over 80% of grapes marketed. Also, some of the major growers interviewed pack and market their own grapes, at least within Panjgur.

Table 10.

IMPORTS OF FRESH GRAPES AND POMEGRANATES, 1989-90 AND 1990-91

Commodity and Country		Tons	Rupees thousands
Fresh Grapes			
	1989.90		
Afghanistan		4071	14316
Total		4071	14316
	1990.91		
Afghanistan		9554	49711
China		253	2535
India		144	824
Total		9951	53070
Fresh Pomegranates			
	1989.90		
Afghanistan		2062	8366
Iran		348	1015
Total		2409	8366
	1990.91		
Afghanistan		3197	12639
Netherlands		46	173
India		364	1591
Total		3610	14402

Source: Bureau of Statistics, Imports

Prior to 1988/89, aside from production consumed within the district (80 tons), grapes originating in Panjgur were marketed predominantly in Turbat. Minor quantities were also shipped to Gwadar and some other coastal towns. Apparently, none of the Panjgur grapes reached Karachi or any other major urban centers. This situation has changed within the past three years with shipment of small quantities to Karachi. Estimated shipments during the 1990-91 are as follows:

Table 11. Estimated Grape Shipments 1990-91

	<u>Tons</u>	<u>Percent</u>
Local consumption	80	10
Turbat	440	55
Gwadar	80	10
Pasni	64	8
Ormara	40	5
Jiwani	40	5
Karachi	<u>56</u>	<u>7</u>
Total	800	100.

Grape Marketing Within Panjgur District

In Panjgur, a considerable quantity of grapes do not enter the money economy. No wholesale business exists for the local markets. Growers sell directly to retailers in small lots, packed in crates of 8-10 kg. In 1991, retail prices per kilo of the three varieties were as follows:

Table 12. Retail Price of Panjgur Grapes 1991

	<u>August</u>	<u>September</u>	<u>October</u>
Sabzu	12	10	14
Kaio	6	6	10
Bagi	8	6	10.

The producer's price was 2-3 Rupees/kilo less than the retail price, depending upon availability and demand in markets other than Panjgur.

Grape Marketing in Turbat

Grapes are packed in wooden crates (net weight 8-10 kg.). These are customarily very loosely packed, leading to damage or total loss of 20-25% of the grapes (see below, Marketing Costs and Margins).

The total supply of grapes in Turbat is roughly 660 tons/year, of which Panjgur provides roughly 2/3; the remainder is divided equally between producing districts in the Quetta area and imports from Afghanistan and Iran. These various sources do not become competitive with supplies from Panjgur in the Turbat market until mid-September because the Panjgur grapes are harvested 1 to 1 1/2 months earlier than those originating elsewhere.

Grapes originating in the Quetta area do not arrive in Turbat until mid-August and terminate in mid-October. These are predominantly the Sabzu variety. Imported grapes begin arriving at Turbat in mid-September and continue until the end of October. Thus, grapes from sources other than Panjgur are available in Turbat only between mid-August and the end of October.

Market Structure in Turbat

In Turbat, grapes and other produce are traded in a municipally-owned wholesale market in the city center. At this market, there are 42 wholesalers operating, of which virtually all handle grapes at one time or another.

Grapes are sold by individual contractors to wholesalers by bargaining; these persons often have relationships of long standing. The same process occurs between wholesalers and a much larger number of retailers of whom an appreciable number are concentrated in the immediate vicinity of the wholesale market.

Overall, the Turbat marketing system appears to be rather competitive, as confirmed by some measures of marketing costs and marketing margins presented below (see table 13).

Grape Prices Over the Marketing Season

In 1991, at the outset of the season (first week of July) when the Bagi variety arrives, the contractor received Rs. 50-65 per crate, delivered in Turbat. For the Sabzu variety, in the second week of July, the price was Rs. 60-80 for this preferred product. Black grapes received Rs. 50-70 in the third week of July.

The arrival of the crop from the Quetta area in mid-August increased the supply in the market and prices fell, but only modestly, by Rs. 5-7 per crate. From early September, when the imported grapes also began to arrive in Turbat, prices declined considerably, to as low as Rs. 30-50 per crate. By the end of September, when the Panjgur harvest was nearly completed, prices began to rise, to Rs. 80-85 for the preferred Sabzu variety.

Mid-October marks the end of arrivals from Quetta and total availabilities were limited to imported grapes; prices again rose to Rs. 80-90 per crate.

These relatively modest price fluctuations suggest that while market demand was satisfied throughout the season, between early September and early October 1991 the market was somewhat oversupplied. This price history, the wholesalers stated, is representative of that over the past four or five years. They added that additional supply would have further depressed prices, at least during the critical period indicated above.

Marketing Costs and Margins

The data shown in Table 13 (next page), expressed in units of one ten-kg. crate, are for the Sabzu variety, as of early October 1991. Analogous data for other varieties or at other dates within the marketing period would not differ significantly.

These data show that growers receive 23% of the retail price at Turbat, which is only 225 km. from the production site. Marketing costs account for 17% and 60% are margins, of which the retailer collects Rs. 48.94, more than half of the total marketing margins.

Grape Marketing in Quetta

Marketing costs and margins for grapes grown in Qambrani and sold in the Quetta market (7 km.) are presented in Annex VI. By comparison with those originating in Panjgur and sold in Turbat, the grower's returns were only marginally higher (26%); marketing costs were 26% and margins accounted for 48% of retail prices.

Returns to growers in the Quetta area do appear low. They are associated with transfer of risk to the contractor who must reimburse the grower whether or not the crop is lost, the grower's interest in receiving this advance, and also transferring harvest costs to the contractor.

Grape Marketing in Karachi

Grapes arriving in Karachi from sources other than Panjgur arrive in wooden crates (13-15 kg.). Those arriving from Panjgur are packed in crates of 8-10 kg. The former are more tightly packed, resulting in lower losses in transport and handling.

The total supply of grapes in Karachi is of the order of 2,400 tons. All of these arrive from Balochistan, but an appreciable quantity, 55-60% of these are transshipped from Afghanistan. A

BEST AVAILABLE DOCUMENT

Table 13. Turbat Costs and Margins (Grapes)

	<u>Rupees</u>
CONTRACTOR:	
Sale price to wholesalers	80.00
Expenses	
Purchase price from grower	31.30
Harvest cost	0.39 ⁷
Freight (Suzuki pick, up, assuming 100 crates)	12.00
Cost of crate	6.00 ⁸
Labor for unloading	1.00
Octroi paid at Turbat	0.19
Total cost	51.88
Margin	28.12.
WHOLESALER:	
Sale price to retailer	85.00
Expenses ⁹	
Rental of shop	250
Assistant	1000
Other labor	500
Miscellaneous	<u>2000</u>
Total	3750
Average turnover	120000 ¹⁰
Total expenses	0.05 ¹¹
Margin	4.95
RETAILER:	
Sale price to consumer	136.00 ¹²
Expenses	
Wholesale price	85.00
Labor, transport to shop	1.00
Rent of shop	1800/month
Assistant	1000/month
Electricity	<u>200/month</u>
Total expenses	3000
Margin-	1.06 ¹³
	48.94

⁷ Labor is paid in kind. This averages 10 kg. of grapes for 80 crates.

⁸ 50% new @ Rs. 10; 50% reused @ Rs. 2

⁹ Rs. per month

¹⁰ Range of turnover is Rs. 40,000 to Rs. 200,000.

¹¹ Assumes that 20% of wholesaler's expenses are for grape marketing.

¹² In each crate, 7 kg. are undamaged. These sell for Rs. 15-20 (average 17.50)/kg. Damaged grapes average 1.5 kg., selling for Rs. 8-10 (average 9.0)/kg. One-half kg. of grapes are totally lost from each crate.

¹³ Range of turnover is Rs. 1,500-2,000/day (average 1,750).

portion of the grapes from Panjgur arrive in Karachi in small amounts brought either by passengers on busses or in vans and pick-up trucks.

The seasonal pattern of total arrivals to Karachi is as follows:

Table 14. Monthly Arrivals of Grapes in Karachi

	<u>Tons</u>	<u>Percent</u>
July	48	2
August	947	39
September	947	39
October	<u>478</u>	<u>20</u>
Total	2420	100.

Market Structure in Karachi

The wholesale fruit and vegetable market is owned by the Karachi Municipal Corporation (KMC). This market has been designated a regulated market under the Agriculture Produce (Markets) Act. Under the provisions of this Act, commission agents are not permitted to operate as wholesalers. Nevertheless, a number of them do act as both commission agents and wholesalers, purchasing produce from growers, contractors and merchants from markets in producing areas at times when prices are low. Service charges by the different market functionaries are also fixed under the Act, but these are only partially observed in practice.

This market has two separate sections, one for transacting business in fruits and the other for vegetables. The fruit market contains fifty-five godowns, forty-eight covered auction plots, twenty-four open auction plots, ninety open or covered plots of small size (six X eight feet) allotted to mashakors¹⁴, eighty-nine small plots in the rear of the market and about 150 covered shops. All these are owned by the Karachi Municipal Corporation. Rental charges by KMC vary from Rs. 250 to 500 per month.

Many of the merchants who operate in the fruit market are members of the All Pakistan Fruit & Vegetable Exporters, Importers & Merchants Association, numbering 150 firms (see Annex VI for a list of members). This Association looks after the interests of fruit and vegetable merchants in Pakistan as a whole. It serves as a link with the Governments for this purpose. The nominated members of this Association also serve on various government boards and committees, for example the Federal Export Promotion

¹⁴ See Table 3, "Karachi Costs and Margins (Grapes)".

Board and the Fruit and Vegetable Committee and the Grading and Standardization Committee of the Export Promotion Bureau, Ministry of Commerce.

A separate Association is the Karachi Fresh Fruit Agents and Commissions Group, which coordinates and controls the operations of the Karachi market. It collects Rs. 5 per vehicle load auctioned, from commission agents who number 98. There are no more a dozen merchants and commission agents in the Karachi wholesale market who deal with grapes and pomegranates. These merchants have their links with up-country producers/contractors/merchants to whom they advance credit against an assurance of sales to them.

Contractors or merchants in producing areas transport ¹⁵ the grapes to the fruit market where they are auctioned by commission agents. Some sales are negotiated directly with the auctioneer-commission agent. The latter are paid various charges by the sellers, including 5-7% of the sale price, as commission. These charges are detailed below.

Commission	5-7%
Unloading	Rs. 0.24/crate
Market Committee Fee	Rs. 0.10/crate
Postal Expenses	Rs. 0.01/crate
Telephone Expenses	Rs. 50. (if a call is made).

Buyers are exporters, wholesale retailers (mashakhors) and retailers. Forty-five to fifty percent of grape purchases are made by mashakhors. Mashakhors sell, either as orderers/suppliers in large lots to institutions, retailers or hawkers or to consumers in lots of not less than one crate. There are about 300 mashakhors in the Karachi market.

A number of commission agents act as wholesalers but under a different name, since commission agents are not legally allowed to operate as buyers. This practice persists in the case of export items only. Since grapes and pomegranates are not export items, wholesalers do not participate in this trade. About fifty percent of grape purchases through commission agents are by retailers who either operate retail shops or work as hawkers.

Most of the fruit arrives during the night and is generally sold in the early hours of the following morning. Transporters who succeed in reaching the market before the start of sales are paid a premium. Commission agents often take advantage of sellers by selling produce below the owner's indicated price. Inadequate storage available to sellers add to their disadvantage here.

¹⁵ The commission agent normally pays transport charges to truckers and deducts them from the sale proceeds.

Retail business is conducted both on the premises of the KMC wholesale market or near it, as well as at various other sites in Karachi. KMC also owns retail markets such as Boulton Market, Machchi Miani Market, Lea Market, Frere Road Market, Empress Market, Hoti Market, Jubilee Market, Soldier Bazaar Market and Liquat-abad Market. Privately owned shops exist in the vicinity of these markets as well as at other sites. Retailing is also conducted by hawkers who are an important part of the retail marketing structure in Karachi (see diagram on page 20).

Grape Prices Over the Marketing Season

Official statistics do not record wholesale prices in Karachi of grapes originating in Panjgur, or of any prices whatever during the month of July when Panjgur grapes begin to arrive in Karachi. Grape wholesalers report that July grapes (when they can be obtained in ripe condition) sell in Karachi for about one-third more than August grapes. The following data, in Rs./40 kg., are available for grapes imported from Afghanistan:

Table 15. Availability of Grapes from Afghanistan

	<u>Rupees/40 kg</u>
1990	
August	795
September	762
October	761
1991	
August	725
September	770
October	800

Wholesalers interviewed stated that Panjgur grapes are sweeter but seedier than those from other sources. No mention whatever was made of the advantage of Panjgur over Quetta as concerns early harvest. This may be due to the very small volumes now arriving from Panjgur.

Marketing Costs and Margins

The data in Table 16 on page 22, expressed in units of one ten-kg. crate, are for grapes of the Sabzu variety from Panjgur as of the first week of October 1991. For comparable data on marketing margins for grapes originating in Quetta, see Annex VII.

**Karachi:
Market Channels for Fresh Fruit**

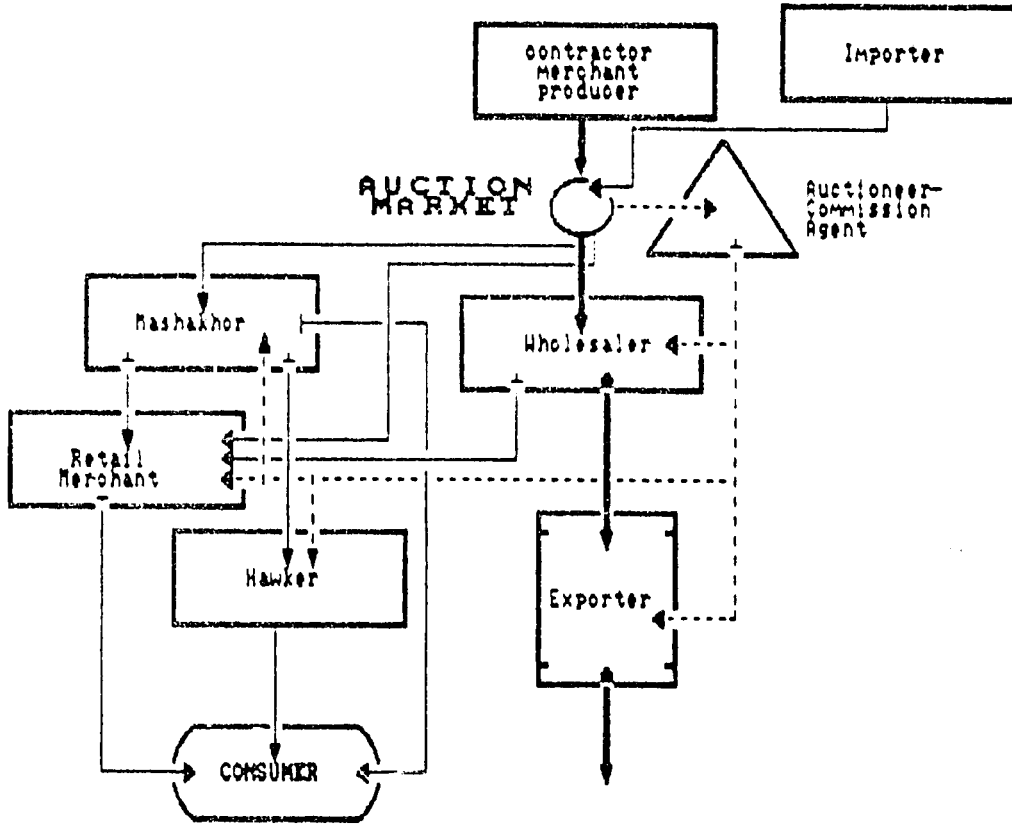


Table 16. Karachi Costs and Margins (Grapes)

	<u>Rupees</u>
CONTRACTOR/WHOLESALE FROM PANJGUR:	
Sale price to mashkahor	160.00
Expenses	
Purchase price from grower	31.30
Harvest cost	0.39
Freight to Karachi	11.11
Cost of crate	10.00
Octroi at Karachi	0.20
Labor for unloading	2.00
Miscellaneous (food and lodging)	1.10
Commission to auctioneer & market committee fee	11.20
Total expenses	67.30
Margin	92.70
SMALL WHOLESALE/RETAILER (MASHAKHOR):	
Sale price to retail merchant	205.00
Expenses	
Purchase price	160.00
Miscellaneous	5.00
Total expenses	165.00
Margin	40.00
RETAIL MERCHANT	
Sale price to consumer	330.00 ¹⁶
Expenses	
Purchase price from mashakhor	205.00
Rental of shop (Rs. 500/month) ¹⁷	0.17
Labor	2.00
Assistant	0.51
Transport	5.00
Miscellaneous	2.00
Total expenses	169.68
Margin	35.32

¹⁶ Seven kg. @ Rs. 40
Two kg. @ Rs. 25
One kg. unsaleable.

¹⁷ Monthly turnover Rs. 200,000 (20,000/day) of which 5% grapes.

Contractors/wholesalers from Quetta earn a marketing margin of Rs. 2.23 more than those from Panjgur. This is largely because they are paid Rs. 30 more for their grapes in Karachi. But Quetta growers receive much higher prices for their grapes (Rs. 45 vs. Rs. 31.30) and transport, packing and transaction costs are all higher for the Quetta grapes. These disadvantages largely offset the higher price in Karachi. These data demonstrate that although contractors from Panjgur receive twice the price in Karachi and more than three times the margin, as compared to sales in Turbat, the imperfect market in Karachi presents major difficulties for contractors from Panjgur.

First, the loose packing at the production site without dividers among the layers of fruit results in considerable loss in handling.

Second, the long time spent on the road to Karachi (at least twenty-four hours) increases these losses.

Third, there is the problem of officials opening the crates for inspection at various sites en route.

Finally, the auction market is rigged, since some independent sellers compete with others whose sales are tied to buyers via credit arrangements with the market actors in Karachi.

B. Pomegranates

1. Pomegranates in Perspective

Production

According to the official data, national production of pomegranates has risen 6% annually between 1985/86 and 1989/90. Balochistan Province is the major producer of pomegranates, contributing about 2/3 of the total. Production data over the past five years are as follows:

Table 17. Balochistan Pomegranate Production (tons)

<u>Crop Year</u>	<u>Pakistan</u>	<u>Balochistan</u>
1985/86	32,300	20,000
1986/87	35,600	20,800
1987/88	26,200	23,300
1988/89	37,700	24,500
1989/90	40,800	27,600

Source: Ministry of Food, Agriculture and Cooperatives, Agricultural Statistics of Pakistan

Within Balochistan, Panjgur is a significant producer of pomegranates. Pomegranate production in Balochistan, by major districts, in 1986/87, was as follows:

Table 18. Pomegranate Production by District 1986/87

	<u>Tons</u>
Quetta Division	
Pishin District	3455
Loralai Division	
Loralai District	8080
Kalat Division	
Khuzdar District	3290
Makran Division	
Panjgur District	2590
All Other	3410.

Source: Balochistan Provincial Ministry of Agriculture

Production in Panjgur District

The commercial producers of pomegranates in Panjgur are generally the same as those of grapes. They number around 150. There are also a larger number of small producers, but their marketable surplus is negligible. In 1991, five of the Union Councils of the District accounted for the bulk of the production. This was distributed as follows:

Table 19. Panjgur District Pomegranate Production 1991

	<u>Tons</u>	<u>Percent</u>
Sari Koran	699	27
Khudabadan	466	18
Gramkan	337	23
Washbood	388	15
Tasp	259	10
Issi	78	3
Kalug	129	5
Katagiri	78	3
Bonistan	78	3
Paroom (sub-district)	<u>78</u>	<u>3</u>
Total	2590	100.

Three varieties of pomegranates are grown in Panjgur, Qandhari (red-skinned, sour), an unnamed variety (pink-skinned, slightly sweet), and Aab-e-dandan (seedless). By varieties, production is:

	<u>Tons</u>	<u>Percent</u>
Qandhari	2072	80
Unnamed variety	259	10
Aab-e-dandan	<u>259</u>	<u>10</u>
Total	2590	100.

Harvest of all three varieties commences in mid-August and continues for three months. Thirty percent of each variety is harvested in August; forty percent, in September; and the remaining thirty percent, in October. Thus seasonal availabilities are:

	<u>Tons</u>
August	777
September	1036
October	777.

Consumption

No consumption statistics for pomegranates are reported in the household income and expenditure document cited above.

Foreign Trade

Official data do not record exports of pomegranates from Pakistan. Table 10 on page 13 shows imports of fresh pomegranates over the past two years. In 1990/91, officially-recorded imports accounted for roughly 10% of apparent consumption. But as in the case of grapes, this is doubtless a significant underestimate, since imported pomegranates marketed in Turbat alone are four times as large as the official figure for total imports from Iran. Ten times as many pomegranate imports are recorded from Afghanistan, and dried pomegranates are not separately listed in the official data. Thus imported pomegranates may account for one-third or more of total consumption in Pakistan.

2. Marketing of Pomegranates from Panjgur

Marketing of Pomegranates in Panjgur District

About 5% of the pomegranates are consumed by producers as fresh fruit. Another 10-15% is dried as an ingredient of sauces, curry or pickle (anardana). Thus the marketable surplus is roughly 2,200 tons. During the past three years, some sales have been made in Karachi. The destination of fresh pomegranates from Panjgur in 1991 was as follows:

Table 20. Destination of Pomegranate Shipments 1991

	<u>Tons</u>	<u>Percent</u>
Turbat	1096	50
Gwadar	175	8
Pasni	88	4
Marod	44	2
Jiwani	66	3
Ormara	66	3
Karachi	651	30.

The fresh fruit is sold directly by wholesalers to retailers, for about Rs. 2-3/kilo below retail prices which in 1991 were as follows, in Rupees per kilo:

	<u>August*</u>	<u>September</u>	<u>October</u>
Qandhari	8	10	12
Unnamed variety	12	12	12
Aab-e-dandan	10	12	12

* The lower prices for the August crop are explained by its immaturity.

Marketing of Pomegranates in Turbat

Pomegranates are not easily damaged in handling. They are transported in bulk (30%), in bags weighing 60-80 kg. (35%), or in crates, each weighing 8-10 kg. (35%).

According to merchants interviewed in Turbat, the quality of pomegranates received from Panjgur is poor in relation to those arriving from Quetta or imported. They purchase Panjgur pomegranates only when the product is not available from other sources.

Sour (pink) pomegranates originating in Iran begin to arrive in Turbat in April and continue until September. These are costlier but of better quality than those produced anywhere in Balochistan. Arrivals from Quetta and Panjgur commence at the

same time (mid-August) and continue until the end of October. Thus Panjgur pomegranates have no seasonal advantage over those from Quetta. Sales of Iranian pomegranates coincide with those of the lower-priced products from Pakistan for about one month.

Market Structure in Turbat

With minor differences, the market for pomegranates in Turbat does not vary greatly from that described above for grapes. Some growers from Panjgur bring their own product for retail sale in Turbat. Some of the pomegranates imported from Iran are sold at wholesale in a second market at another site on the outskirts of town.

Prices Over the Marketing Season

When available, the wholesaler's price of pomegranates originating in Iran is Rs. 200-280 per carton (30 kg.). The price of Quetta and Panjgur pomegranates is Rs. 165-225 for equivalent weight, although these arrive in 10-kg. crates or in bulk. There is no difference between the price of pink and white pomegranates in Turbat, regardless of their origin.

There appears to be no significant seasonal variation in either of these prices.

Marketing Costs and Margins

The data on Table 20 on the next page, expressed in units of 10 kg., are for pomegranates originating in Panjgur, as of early October 1991. It should be noted that although there is very little wastage in the marketing chain, wholesale and retail margins for this product are somewhat higher than those for grapes despite the low quality of the pomegranates originating in Panjgur.

Marketing of Pomegranates in Karachi

Pomegranates arrive from Panjgur and elsewhere in Balochistan in crates of various weights. Those arriving from Panjgur contain 8-10 kg. Arrivals from other areas are in crates containing two layers weighing 8-10 kg.; in three-layered packs weighing 12-14 kg.; and mixed quality and sizes in crates weighing 14 kg. Split pomegranates arrive in 14 kg. crates. Crates arriving from Punjab weigh 12 kg. Those transshipped via Quetta from Afghanistan contain 15-16 kg.

Table 21. Turbat Costs and Margins (Pomegranates)

	<u>Rupees</u>
CONTRACTOR/GROWER:	
Sale price to wholesaler	60.00
Expenses	
Grower's price	35.00
Harvest cost	1.87
Freight	13.00 ¹⁸
Labor, unloading	1.00
Octroi paid at Turbat	0.19
Total expenses	51.06
Margin	8.94
WHOLESALER:	
Sale price to retailer	67.00
Expenses	
Contractor/grower's price	60.00
Other	.05 ¹⁹
Total expenses	60.05
Margin	6.95
RETAILER:	
Sale price to consumer	120.00
Expenses	
Retailer's price	67.00
Other	1.06 ²⁰
Total expenses	67.06
Margin	52.94

¹⁸ Suzuki pick-up, assuming 900 kg.

¹⁹ See grapes.

²⁰ See grapes.

Volume of Sales and Their Sources

Total supply of pomegranates to Karachi is of the order of 3,500 tons. Of this, the sources are approximately the following:

Table 22. Sources of Pomegranates, Karachi

	<u>Tons</u>
Punjab	12
Quetta	1,324
NWFP	11
Panjgur	10
Afghanistan	<u>2,168</u>
Total	3,525.

The seasonal variation of arrivals from the different Provinces are:

	<u>Punjab</u>	<u>Quetta/Afghanistan</u>	<u>NWFP</u>	<u>Panjgur</u>
August	5.0	-	-	4.0
September	4.5	725.0	3.8	4.0
October	2.5	1450.0	3.8	2.0
November	-	1350.0	3.4	-

According to wholesalers interviewed, pomegranates arriving from Punjab are white, seeded and sweet. Those coming from NWFP are seedless. Quetta and Afghan pomegranates are red and sour. Panjgur pomegranates are described above.

Prices Over the Season

Seasonal price variations depend upon the source of the produce. Official data on wholesale prices of pomegranates imported from Afghanistan are as follows:

Table 23. Pomegranate Prices by Month

	<u>Rs./40 kg.</u>
	1990
July	-
August	-
September	350
October	327
November	-
	1991
July	-
August	-
September	-
October	410
November	-

We have unofficial information on pomegranate prices in Karachi only for those originating in Quetta. These are as follows:

	<u>Rupees/crate (15.5 kg.)</u>
September	110-130
October	120-140
November	180-200 ²¹

Market Structure in Karachi

There is no significant difference between the market structure for pomegranates and that for grapes. Since pomegranates are not exported from Pakistan, wholesale trade does not exist in this commodity in Karachi. Sales of pomegranates take place in three forms: (1) open auction, (2) undercover bidding without auction, (3) individual bargaining.

The major buyers in the wholesale market are mashakhors (66%) and retail shop owners (34%). These market actors perform in the same fashion as in the case of grapes. Mashakhors sometimes keep a part of pomegranate purchases in cold storage which costs Rs. 8/crate/month. Other costs are the transport to and from cold storage (Rs. 2.50/crate) and labor at the cold storage site (Rs. 2.00/crate). Stored crates are delivered either to institutions or to consumers in the wholesale market, or to retailers or hawkers in Karachi.

Marketing Costs and Margins

The data shown in Table 24 on the following page and expressed in units of 15 kg., are for pomegranates of the Qandhari variety from Quetta, as of the first week of October.

Marketing margins for pomegranates at all levels of trade are lower in Karachi than those for grapes because of the diversity of sources of supply. But as in the case of grapes, margins are much higher in Karachi than in the Makran. Assuming that grower prices are identical in Panjgur and Quetta, contractors receive seven times the margin in Karachi than they do in Turbat, although the distance by road from Panjgur to Karachi is only three times farther (640 km.), over better roads.

²¹ Arrivals in September are not fully mature and therefore bring a lower price. The price is significantly higher in November, since pomegranates are no longer available from Punjab and some fruit from Quetta is placed in cold storage at that time.

Table 24. Karachi Costs and Margins (Pomegranates)

	<u>Rupees</u>
CONTRACTOR/WHOLESALER FROM QUETTA:	
Sale price to Wholesaler	130.00
Expenses	
Purchase price from grower	35.00
Harvest cost	1.87
Freight	10.00 ²²
Cost of crate	10.00
Octroi at Karachi	0.20
Labor for unloading	2.00
Miscellaneous (food and lodging)	1.10
Commission to auctioneer & market committee fee	9.10
Total expenses	69.27
Margin	60.73
WHOLESALER:	
Sale price to retailer	158.00
Expenses	
Purchase price from contractor	130.00
Rental of shop	0.02 ²³
Assistant	0.10
Labor cost	2.00
Miscellaneous	1.00
Total expenses	133.12
Margin	24.88
SMALL WHOLESALER/RETAILER (MASHAKHOR):	
Sale price to consumer	188.00
Expenses	
Purchase price from wholesaler	158.00
Miscellaneous	5.00
Total	163.00
Margin	25.00
RETAILER:	
Sale price to consumer	225.00
Expenses	
Purchase price from wholesaler	158.00
Rental of shop	0.17 ²⁴
Labor	2.00
Assistant	0.51
Transport	5.00
Miscellaneous	2.00
Total expenses	167.68
Margin	57.32.

²² Rs. 5000/truck carrying 500 crates.

²³ See grapes.

²⁴ See grapes.

CHAPTER III. MARKET POTENTIAL FOR FRUITS NOW PRODUCED, OR WHICH COULD BE PRODUCED IN PANJGUR

A. Market Potential for Panjgur Grapes

As indicated in Chapter II, 93% of the grapes grown in Panjgur District are consumed locally or in the Makran. In the Makran we have examined in detail only the markets in Panjgur Department and at Turbat. A considerable share of the local production does not enter the money economy; prices in Panjgur depend on demand from outside the District, principally at Turbat which absorbs 55% of total cash sales. There appears to be no further expansion potential for cash sales of grapes in Panjgur District.

At Turbat, grape prices are fairly constant between July and early September. Then the crop from Iran and Afghanistan begins to arrive in Turbat, and prices drop from Rs. 60-80 to 30-50 per crate. Since the contractor's margin exceeds Rs. 28 per crate, even at the lower prices, this trade can doubtless continue at the present level, so long as arrivals from Panjgur, Quetta Afghanistan and Iran do not increase.

Only 1/6 of the grapes now arriving at Turbat are of Iranian or Afghan origin; but when they appear on the market they cause a drop of about 60% in the price. Such a major consequence resulting from a small increase in supply demonstrates that demand for grapes in Turbat is highly price-inelastic. Thus a relatively small increase in supply from Panjgur could wipe out the contractor's margin altogether. Unless income in Turbat rises substantially in the near future, it seems unlikely that the Turbat market for grapes from Panjgur will grow to any extent.

Other markets in the Makran are similar to those at Turbat -- farther still from the Quetta grapes, for the most part, but within the marketing area of Iranian grapes. As soon as these become available, prices probably fall sharply throughout the Makran. And there is even less likelihood of large increases in consumer income in other markets in the Makran which might permit expansion of grape sales from Panjgur without a drop in their price. First, repatriation of income by expatriate labor in the Persian Gulf is falling throughout the Makran, as these expatriates are returning in large numbers. Second, unlike Turbat which has become a source of dates which are increasingly demanded in world markets, the other areas in the Makran do not produce commodities with promising growth prospects. Panjgur grape merchants must find new markets if sales are to grow.²⁵

²⁵ In 1987-88, Baluchistan urban consumers spent 0.43% of household income on grapes. Rural consumers spent 0.29%. Of these (rural and urban) only 83,000 earned more than Rs. 4,500 per month. Federal Bureau of Statistics Household Income and Expenditure Survey, 1987-88

There is a very large market for fresh grapes in Karachi, ²⁶ even for the seeded varieties produced in Panjgur, which offers much higher marketing margins to contractors/merchants than are available in the Makran. These are detailed in Chapter II. Contractors and merchants in Panjgur have begun to take advantage of the Karachi market only within the past three years. So far, penetration of the Karachi market from Panjgur has not been achieved in any systematic fashion. Many of the Panjgur grapes arrive on busses along with travellers to Karachi.

Very few merchants either in Panjgur or in Karachi appear to be aware of the fact that Panjgur grapes are available 1 1/2 months earlier than those arriving from the Quetta area. These early grapes would command considerably higher prices (merchants interviewed there stated that July grapes could be sold for at least 1/3 more than those arriving in August). There is no evidence that the Panjgur merchants have capitalized on this fact, or attempted to profit from the much higher margins obtainable in Karachi, especially early in the season when grapes are available there from no other source.

Early seedless grapes could doubtless be marketed in Karachi at even greater premiums (see comparison between prices of Quetta and Panjgur grapes in Karachi, Chapter II).

Thus Panjgur merchants need to place one of their own people at this time in the Karachi auction market. He could telephone the contractors at home concerning prices in Karachi and direct shipments there from less profitable markets in the Makran. From increased revenues from sales in Karachi, the Panjgur grape growers and contractors could easily earn the cost of keeping an agent in Karachi to direct grapes there, especially early in the marketing season. He could make contact with market actors in Karachi and seek markets for other commodities from Panjgur.

B. Market Potential for Panjgur Raisins

Dates, grapes and pomegranates are the only commercial fruit crops grown in Panjgur District. The resistance of growers to alter cultural practices, and of merchants to find access to major markets for these crops sharply restrict markets for existing production. But meanwhile, land development programs resulting from increased water supply in such areas as Katagri, Parom Sub-tehsil, Zindadaz Union Council and Dumb, are bringing new areas under cultivation. As discussed in Chapter II, even marginal increases in supplies of grapes to consumption centers in the Makran now cause a substantial decline in prices. With

²⁶ In 1987-88, Sind urban consumers spent 0.08% of household income on grapes. Of these, over 700,000 earned more than Rs. 4,500 per month. ibid.

limited market outlets, if these new lands are planted in grapes of the varieties now grown, major marketing problems for fresh fruit appear inevitable.

One solution lies in introducing technologies for dehydrating grapes to convert them into raisins. Grape dehydration is not a complicated process. Grapes are normally dried to raisins from 83.54% to 20% moisture content, a yield of 1:5.²⁷ (see Annex IV). Traders claim that the yield is closer to 1:4. The establishment of cottage industries for this purpose is a feasible solution to Panjgur District's looming grape marketing problem because Pakistan is currently importing substantial quantities of raisins.

Official data on imports of raisins and other dried fruits in 1989/90 and 1990/91 are shown in Table 25 on pp. 35-36. These clearly under-estimate the total volume of imported raisins. In 1990/91 the official import figure for raisins was only 400 tons. Interviews with dealers in dried fruits suggest that substantial quantities of raisins are produced in Afghanistan. Total arrivals in marketing centers in Pakistan are estimated at 10,000-12,000 tons annually. Minor amounts arrive from Iran, and about 1,000 tons are produced in Pakistan. About 200 tons/year of seeded raisins (munakhqa) are included in these totals.

Although official export figures for raisins are not available, these are estimated by the trade to have been 1,000 tons in 1990 to Bangladesh alone. Another 400 tons are exported to India.

Raisins sell for higher prices than fresh fruit (Rs. 700/40 kg. for seedless raisins in the main assembly market of Quetta). Marketing costs and margins are shown in Table 26 on page 37, in units of 40 kg.

The marketing margins shown here lend strength to the recommendation to introduce preparation of raisins in Panjgur District. The establishment of such facilities can absorb grapes which appear unlikely to be marketed as fresh fruit in the foreseeable future, protect against sharp reductions in prices and ensure high returns to producers. This would thus make grape cultivation and raisin production a profitable undertaking.

Agricultural extension staff should be advised and trained to provide guidance to growers to introduce seedless varieties of white grapes which command price premiums not only as fresh fruit but also as raisins. Seedless black grapes can also be introduced profitably since raisins produced from them have domestic and international markets for bakeries and household use.

²⁷ Thus, 100 kg. of grapes (Kishmish variety) should dry to 19.75 kg. of raisins containing 20% moisture. Of this, 1.52 kg. is bound water and 1.77 kg. is free water (from data provided by Dr. H. Hejaj, Saraib Experiment Station, Quetta)

Table 25.
 COMMERCIAL PRODUCTION OF DRIED FRUITS, BY COUNTRIES, 1990
 Commodity and Country (000 Tons, Dry Basis)

Apples	
United States	10.8
South Africa	0.1
Total	10.9
Apricots	
United States	6.1
Australia	1.9
Iran	13.2
Spain	1.3
South Africa	1.1
Total	10.4
Currants	
Australia	9.0
Greece	91.0
South Africa	0.6
Total	100.6
Figs	
United States	14.4
Greece	28.4
Italy	22.5
Portugal	12.0
Turkey	55.0
Total	132.3
Peaches	
United States	2.8
Australia	0.4
Chile	1.5
South Africa	1.7
Total	6.4
Pears	
United States	0.5
Australia	0.3
South Africa	1.7
Total	2.5

Table 25.
 COMMERCIAL PRODUCTION OF DRIED FRUITS, BY COUNTRIES, 1990
 Commodity and Country (000 Tons, Dry Basis)
 (Cont.)

Prunes	
United States	160.7
Argentina	4.4
Australia	5.0
Chile	5.3
France	15.4
South Africa	1.8
Yugoslavia	20.0
Total	213.6
Raisins	
United States	193.4
Argentina	3.3
Australia	94.9
Chile	0.8
Greece	85.0
Iran	60.0
South Africa	13.8
Spain	7.7
Turkey	140.0
Total	604.9

Source: USDA, Foreign Agricultural Service

Table 26. Karachi Costs and Margins (Raisins)

	<u>Rupees</u>
PRODUCER IN QUETTA:	
Sales price to Karachi wholesaler	700
Expenses	25
Net return to producer	675
KARACHI WHOLESALER	
Sale price to small wholesaler	850
Purchase price in Quetta	700
Expenses, including transport	37
Margin	113
KARACHI SMALL WHOLESALER	
Sale price to retailer	1050
Expenses	
Purchase price from wholesaler	850
Other marketing expenses	35
Margin	165
KARACHI RETAILER (HAWKER)	
Sale price to consumer	3200
Expenses	
Purchase price from small wholesaler	1050
Other marketing expenses	20
Margin	2130

C. Market Potential for Panjgur Pomegranates

Consumers of pomegranates in Turbat, and probably throughout the Makran, currently appear to be rather indifferent to quality. Prices of pomegranates in Turbat do not change regardless of qualities and quantities available from other sources. The markets in Turbat and elsewhere in the Makran seem to be able to absorb a portion of the fresh pomegranates of low quality which are now produced in the Panjgur District.

But Karachi consumers are more discriminating than those in the Makran. Also because of greater competition from other areas, the Karachi market for fresh pomegranates from Panjgur does not appear to offer much promise for expansion.

As in the case of grapes, the production of pomegranates in Panjgur District is likely to rise, since dates, pomegranates and other fruits are traditionally grown together in that District. With limited possibilities for market expansion in the Makran and lack of demand elsewhere, one possibility for market expansion is to improve the quality of the fruit by grafting improved varieties on existing trees (see Annex III). This no doubt will take time. An alternative solution is dehydration of pomegranates for sale as anardana. Dried pomegranate (anardana) is widely used in production of sauces and curries.

Anardana is prepared in Panjgur District for local consumption, largely from unsaleable split pomegranates. The processing ratio of fresh pomegranate to anardana is 4:1. Production of anardana could be expanded, because sizeable quantities of this product are consumed in Pakistan. Although official import statistics do not segregate anardana, the trade estimates imports of 3,000 tons per year. Half of this is assembled in Quetta and the rest, in Peshawar. Imports are largely from Afghanistan, although some are said to originate in Iran. Exports of anardana are limited to the Gulf states where it is consumed mostly by expatriates from south Asia.

Market prices for anardana, in units of 40 kg., are as follows:

	<u>Rupees</u>
Producer Price in Quetta	400-450
Wholesale Price in Karachi	600-650
Small Wholesaler Price in Karachi	850-900
Retail Price in Karachi	1280-1400.

The low share of the producer in the consumer price of fresh pomegranates (see Chapter II) and the small likelihood of producing pomegranates with acceptable flavor in Panjgur District offers a promise of a more profitable commercial dehydration industry.

D. Market Potential for Panjgur Figs

Despite the ease of growing figs in Panjgur, total local production is not more than 5-7 tons. Of this, 70% is harvested in the Union Councils of Washbood, Garmkan, Khudabadan and Tasp. No fresh figs are currently marketed outside Panjgur District.

Figs are expensive to package for the fresh market, even though some consumers in Karachi would doubtless pay the necessary price to obtain fresh figs of good quality. The proposed Panjgur grape agent might develop a market for fresh figs if they are properly packaged to arrive in good condition.

There is a growing market for dried figs in Pakistan, even though official data show virtually no imports of dried figs. Domestic production of dried figs is estimated by the trade as 2,000 tons. These are grown and prepared along the border with Afghanistan. The harvest season for figs in the areas of Pakistan where they are now grown commercially is from September to December. Harvest in Panjgur commences about two months earlier.

Some 200 tons/year of dried figs arrive in Pakistan from Afghanistan. Dried figs are transported in Pakistan in crates of 20 kg. Small quantities are exported to Gulf States in cartons of 10-20 kg.

Although there is substantial international trade in dried figs, export possibilities from Pakistan are limited. The varieties which make the best dried figs are currently grown only in very small quantities in Pakistan and traditional drying practices further lower the quality of the product. Turkey is the major world producer of dried figs (see Annex IV).

Growers in Panjgur District could, however, undertake growing and drying of figs, since the climate of the area is suitable for this purpose. Grower prices are attractive (Rs. 1050 per 40 kg.). Production of high-quality figs suitable for drying is easily learned. The fig has the advantages of easy propagation of trees, rapid development to bearing and production of two crops each year (see Annex II). Drying can be performed as a cottage industry (Annex IV). Thus expansion of fig production in Panjgur rates the highest priority at this time, for sale as both fresh and dried fruit.

Over the next few years, commercial growing of figs can be introduced on new irrigated lands in Panjgur District. The Agricultural Extension staff should be advised to encourage farmers there to plant figs as well provide necessary technical know-how regarding fig culture and fig drying.

The preceding recommendations are likely to improve the economic conditions of the people of Panjgur District by developing new labor-intensive activities. These will take the form of:

- (a) Improvement of cultural practices,
- (b) Introduction of new and improved varieties of existing crops,
- (c) Diversification of horticultural crops,
- (d) Establishment of cottage industries which do not now exist.

These potential gains can be accelerated by:

- (a) Expanding existing research efforts,
- (b) Effecting a major reorientation of the Agricultural Extension Service,
- (c) Enforcing the Agricultural Produce Markets Act in the Province of Balochistan.

CHAPTER IV. CONCLUSIONS

Accelerating the improvement of agricultural production in oasis areas is an extremely complex undertaking. The production systems used in these areas, based primarily on traditional practices, are often considered unproductive or obsolete. Yet there is considerable value in the generations of experience that have led to these systems. Farmers employ a complex mixed cropping system which includes dates, fodder crops, grains, vegetables and other fruits. Rational recommendations for crop improvement leading to increases in overall farm income requires sustained research, not only on single crop factors, but also on the interrelationship of crops found on any one property. This information can only be derived from a systems approach to farm research. The Panjgur area offers an ideal area for the Agricultural Research Institute, Sariat (ARI) to expand its Farming Systems Research Program.

Irrigation facilities are being developed at a rapid rate in the Panjgur area. More irrigated land will thus be available which very likely will be planted in traditional crops. The volume of grapes and pomegranates now produced already pose marketing problems. Further increases in production will seriously aggravate this problem.

The most important fruit crops (aside from dates) grown in Panjgur District are seeded grapes and pomegranates. The markets for grapes can now bring high returns if marketed sufficiently early in Karachi, but expansion of sales in nearby markets in the Makran would probably reduce producer returns because they would cause very a large reduction in their prices.

Grape growers in Panjgur have been unaware of correct pruning practices which resulted in yields below their potential. Some extension work demonstrating pruning undertaken by the BALAD Project in association with the technical staff of the Sariat Research Station has resulted in increased yields of 50% or more. Further cultural practices such as bunch pruning, fertilizing, vine training and water management would doubtless increase yields by much more.

The climate in Panjgur District is suitable for growing many seedless grape varieties. Because of the relatively warm temperatures these varieties produce grapes earlier than at higher elevations, e.g., the Quetta area. These would command higher prices in Karachi. Quetta merchants receive Rs. 30 more per crate in Karachi for grapes than those from Panjgur. In addition, seedless raisins are more readily marketable than the seeded product. Ideally, Panjgur growers should be producing fresh grapes for the early season and later convert to raisins.

Since 1982, the Sariat Research Station of the Department of Agriculture of the Government of Balochistan has been growing

seven varieties of seedless grapes and is capable of providing adequate quantities cuttings and/or rooted plants at nominal prices to the growers for the propagation of them.

The delayed onset of chilling temperatures in the Panjgur area inhibits development of the flavor of the pomegranates grown there. In spite of the importance of pomegranates in the fruit orchards of the area, scope for profitable expansion of this fruit is therefore limited.

The absence of knowledge of water management practices causes splitting of pomegranates to a considerable extent. Absence of pest management causes further damage to this fruit. Post-harvest handling practices are highly dysfunctional, resulting in losses. As an example, due to loose packing, on average 20-25% of grapes are damaged or totally lost in transport from Panjgur to Turbat, a distance of only 225 km.

Links between the producers and market actors in Panjgur and the markets in consumption centers are weak. These could be strengthened by development of a producer organization who could place one of their people in Karachi to facilitate movement of desired produce to that market.

Technologies for preservation of fruit by dehydration are largely unknown in the region, although this technology is an appropriate cottage industry now widely available from Afghan residents of Pakistan. Application of these technologies could expand and diversify markets for fruits produced and increase returns to growers in Panjgur District, but it must be mobilized by official research and extension workers now in place.

Although cultivation of figs in the District is practiced to a minor extent, the climate of the area is conducive to expansion of this crop, to meet demand in Pakistan which is presently met through imports. Expected increases in production could be profitably utilized by dehydration without adverse effect on market prices, since a large market for dried fruit exists in Pakistan which is met almost entirely by imports. It should be noted that seeded raisins sell at prices far below the seedless ones. Dried figs could also readily find markets abroad.

The main constraint to market expansion is the low quality of the products produced in Panjgur District and absence of production of those products most in demand.

Unorganized market structures and practices result in excessive marketing costs and exorbitant margins by all market actors. Producers receive a disproportionately low share of the consumer price. In an effort to deal with this situation the Province of Balochistan has this year promulgated the Agricultural Produce (Market) Act which aims to regulate marketing practices by controlling charges for services performed in wholesale markets. For now, the plan is to apply the Act only in the Quetta market. Over time, some means may be found to employ this mechanism to

reduce some of the handicaps now encountered by Panjgur producers and merchants in the marketing areas which they serve in Balochistan.

Implementation of programs to improve the situation of Panjgur farmers will require a large amount of work by National and Provincial research centers, local agricultural extension services and marketing sections. The existing organizations are not equipped or oriented at this time to implement the programs outlined above. Projects by foreign donors are not now directed at any of the steps necessary to improve the incomes of Panjgur's farmers and must become involved in them. The authors of this report hope that the information presented here may orient national and donor efforts to develop suitable projects and programs.

CHAPTER V. ACTION PLAN

The following action plan addresses the three areas most in need of improvement in the Panjgur; Production, Post Harvest Technologies, and Marketing. It classifies the recommendations listed under these areas into strategies focused on short-term, medium-term and long-term interventions. While these recommendations cannot address all the problems facing fruit growers in the district, they do represent those interventions that the authors feel will have the greatest impact.

A. Production

1. Short-Term Activities:

a. Demonstrations of pruning in existing vineyards by BALAD and a specialist from the Agricultural Research Institute (ARI), located at Sariab have already resulted in very significant productivity increases. The success of the farmers who have adopted pruning practices stimulated other growers to attempt to prune without the proper know how.

The pruning demonstration needs to be repeated so these techniques are introduced to a greater number of farmers.

b. Other practices such as improved water management, use of chemical fertilizers, appropriate training of vines and bunch thinning have not been demonstrated to any extent, and their potential results or receptivity to them by grape growers in the area are unknown.

Means for expanding the demonstration concept must be developed at this time by the Research Staff at ARI in coordination with the twenty Agricultural Field Assistants currently working in the area.

c. The introduction of new varieties of grapes is covered below as a medium term activity. Certain steps can be taken in the short term to pave the way for this activity.

Certain progressive farmers in Panjgur and the staff of the Fruit Extension Station in Quetta need to be brought together so that cuttings of selected varieties will begin to be planted on some farms in the region. This is an activity to which BALAD can provide assistance in identifying the most likely farmers and coordinating with the research staff at ARI.

d. The lower quality of pomegranates produced in Panjgur District, as compared to those grown in other more suitable areas such as the Quetta region do not justify encouraging growing this

BEST AVAILABLE DOCUMENT

fruit, particularly in areas of the district which are now coming under cultivation as a result of development of new irrigation facilities.

Growers should be advised to introduce other fruit crops which would be more profitable.

2. Medium Term Activities:

It will take a coordinated effort between the Research Staff in Quetta and the local Agricultural Extension Staff in Panjgur to develop and introduce new varieties of grapes there. The Sariab Experiment Station propagates a number of seedless varieties, including Kishmish, Shandokhani, as well as imported varieties as Ruby, Red, Perlette and Thompson. The latter are grafted on local rootstock. An ample supply of grape cuttings is available at nominal prices (rs 1 - 2 each) from this source. Since grapes can be propagated in a variety of ways, such as cuttings, rooted plantlets and grafting, various techniques might be employed. This will require training of Extension Staff and farmers in these techniques and cultural practices associated with these cultivars. Follow-up of planting and evaluation of results will have to be included in this program.

Introduction of new grape varieties in the Panjgur District should become a priority activity of the Agricultural Department in Balochistan.

3. Long-Term Strategies:

a. The climate in Panjgur is highly suitable for growing many varieties of figs. There are a large number of varieties available, many of which are suitable for production of either fresh or dried fruit.

Some varieties require high technology for growing which would be quite difficult for Panjgur growers to master without a considerable amount of sustained assistance (see Annex II). Pre-selection of suitable varieties is a necessity. As significant experimental work on figs has not been carried out at the Sariab Experiment Station and cuttings are not available from that source, the introduction of figs in the Panjgur area must be considered a long-term activity.

The market demand, local and international, and the flexibility afforded by a fruit that can be sold either fresh or processed, make the expansion of fig cultivation an attractive prospect.

b. The sustained improvement of agricultural production in oasis areas is an extremely complex undertaking. Farmers employ a complex mixed cropping system which includes dates, fodder crops, grains, vegetables and other fruits. Rational recommendations

for crop improvement requires research not only on single crop factors, but the interrelationship of crops found on any one property. This information can only be derived from a systems approach to farm management research.

The Panjgur area offers an ideal area for the Agricultural Research Institute, Sariab to expand their Farming Systems Research Program to study and improve oasis farming systems. The Agricultural Department should direct efforts in this direction.

B. Post Harvest Technologies

1. Short-Term Activities:

a. Existing field packing and post harvest methods are defective and lead to substantial losses.

The Marketing Division of the Department of Agriculture must be directed to assist in the introduction of appropriate techniques of handling and packaging fresh fruits. The Division must also assist growers and dealers in grading fresh fruit on the basis of uniform size and maturity and freedom from defects. Crates of fruit so prepared and graded can reach their destination in better condition.

b. As a measure of minimizing existing post-harvest losses and diversifying markets for fruit produced in Panjgur District, dehydration and preservation technologies must be introduced. This can be conducted as a cottage industry (see Annex IV). There is sufficient demand in Pakistan for raisins, dried figs and anardana which is currently met by imports. Re-exported raisins and dried figs are also important items of trade. Introduction of this technology will protect growers against drops in prices in the peak season and increase their returns.

A specialist should be brought to Panjgur to hold farmer training sessions in raisin drying. This person could be contracted for by a suitable donor agency, possibly USAID under an existing IQC or Training contract or the ongoing FAO project in support of ARI.

2. Medium-Term Activities:

Short term training will introduce a certain number of farmers to these technologies, but still the area will lack expertise. A mechanism must be found to insure that fruit drying expertise will be institutionalized in the area. At a later stage, growers must be instructed in methods of packaging dried fruits in order to prolong their shelf life.

At least one Agricultural Officer from the Agricultural Extension should be sent to Quetta to receive training in fruit drying

coordinated by ARI, Sariab. This officer, preferably a horticulturalist, would be responsible for coordinating extension efforts in this technical area in Panjgur District.

C. Marketing

1. Short-Term Activities:

In order to increase grower's returns, they must develop association in order to create economies of scale in marketing their produce. This type of cooperation is evident in the date growers association already existing in Panjgur District. This association should extend its activities to increasing penetration of the Karachi market. The major constraint to increasing the growers position in that market is the lack of information flow between the two areas. The market in Karachi is unaware of Panjgur fruits, especially the earliness of the grape harvest. Growers in Panjgur have no information on daily auction prices of fruits at the market. There is a need for grower representation and promotion in the market.

Growers in Panjgur should appoint their own agent or make arrangements with some reliable party to represent them in the Karachi market. This person would direct shipments of product to Karachi from less profitable markets in the Makran and develop new markets, especially for fresh figs and dried fruits.

2. Medium-Term Activities

Growers and contractors selling fruit in major consumption centers in the Province need to be protected from exploitation by middlemen. Marketing costs and margins are inordinately high in the Makran.

The Agricultural Produce (Markets) Act of Balochistan, 1991, must be extended beyond the Quetta market to include the Makran and other major consumption centers in the Province.

3. Long-Term Activities

Agricultural credit programs in Pakistan have so far been linked to production activities. Making credit available for marketing purposes can improve the bargaining power of the grower.

Linking of credit with marketing should be encouraged. Institutional arrangements for this purpose are clearly required in future donor financed agricultural credit projects.

ANNEX 1:
Grape Culture

BEST AVAILABLE DOCUMENT

· 462

ANNEX I: GRAPE CULTURE

Some type of grape is grown in virtually every climate of the world, but most grapes are grown in temperate zones, 30-50° N-S latitude. However, some grapes are grown outside these general areas, e.g., in Mexico, Taiwan, Northern Queensland and southern Baluchistan.

VARIETIES: Classification of grape cultivars is basically in terms of temperature degree-days. This last is determined by subtracting 50° F (10° C) from the monthly mean temperature and multiplying that figure by the number of days in the month, from April through October, thus:

May (85°-50°) F X 31 = 1085, etc.

The total degree days then translate into regions: 4001 and upwards are classified as hot, ie. Fresno, California. Most grape varieties suitable for hot regions are European grape Vitis vinifera varieties. There are over 8,000 named European varieties, 60 of importance in California.¹⁵ Of these, the most widely grown in hot regions are Thompson, Ruby, Flame (seedless) and Emperor (seeded). None of these last-named varieties require more than 50-200 hours of chilling (computed as above, degrees F - 50 X number of winter days X 24). Thus, all of them could be grown in Panjgur District (see Chapter I).¹⁶

In the southern U.S. and Caribbean, limited production exists of Muscadine Vitis rotundifolia grapes, since they tolerate heat and mild winters and the vines are very vigorous. These grapes have a noticeable musky odor; the seeds are quite large; and the bunches are small and loose. Muscadine grapes are used for cooking and local fresh markets. More commonly, however, they are grown for rootstock as they are resistant to phylloxera. Because of their musky taste they could not be recommended as topstock for commercial production in the Makran.

¹⁵ Childers, N.F., Modern Fruit Science Eighth Ed. Rutgers University 1978; Scheer, A.A. and E.M. Juergenson, Approved Practices in Fruit and Vine Production, Second Ed. Interstate 1976; American and French Hybrid Grape Varieties, Foster 1990; Kimball, K.H. "Converting Mature Vineyards to Other Varieties", N.Y. State Agric. Exp. Station Rept. 22 1976.

¹⁶ In addition to these varieties, Red and Perlette have been grafted on Koober SB rootstock at the Saniac Experiment Station, near Quetta. However, better results have been obtained there from some other varieties (see Chapter IV).¹⁷

All of the above-named varieties are suitable for table, raisins and processing. The pulp and skin stick together and the fruit is sweet throughout.

CULTURE: The best vineyards grow on moderately fertile, well-drained sandy or gravelly loam soil (with four to six feet rooting area) which contains a good supply of organic matter. The lighter sandy soil types promote earlier ripening and higher sugar content of the grapes than do heavy soils. Grapes respond only to nitrogen fertilizer, although zinc deficiency may be encountered in some areas. Grapes require water around the year, especially during the period of fruit development.

Growers employ three methods of grape propagation: (1) From cuttings, which begin to bear fruit in the fourth and fifth years. These are planted in soil which is kept moist until the vines are established. (2) From rooted cuttings, which bear from the third year. (3) From grafts on existing rootstock which will bear fruit on the same year they are grafted (tongue grafting is the method usually employed). Grafting can be done on vinifera types at any age. No method of grape propagation exists which guarantees the absence of spreading of bacterial or virus diseases. Grafting has the advantages of the shortest period to bearing and the least likelihood of spreading disease as compared to either of the other two methods.

Grape size is achieved by appropriate pruning and bunch thinning of 1/4 of the developing grapes at the distal end of the bunch; and sometimes, by girdling. This last involves the removal of a 3/16 inch strip of bark from around the main trunk at blooming time on seeded grapes. On seedless grapes, girdling is performed as soon as possible after berries have set. More sophisticated growers employ gibberillin sprays to further augment the size of the grape. Berry thinning is practiced by cutting off the end of the main stem and several branches of the cluster, or by cutting off enough of the main stem to leave only the desired number of berries.

Recommended methods of pruning and training of grapes vary with the variety, vigor and age of the vine, and authorities differ. All agree that it is important that the vines be pruned annually so that an adequate amount of one-year wood is available from year to year near the trunk of the tree. If mature vines have been neglected they become rangey and the best fruiting wood will be found a long distance from the base of the vine. Select from four to six reasonably desirable canes for fruiting as near to the central trunk of the vine as possible. After two or three years of renewal pruning and selecting, fruiting canes closer and closer to the main trunk, neglected vines can be brought to a fairly manageable pattern.

There is no particular advantage to planting an early-maturing grape, since maturation is by and large a function of temperature.

HARVESTING, PACKAGING AND STORAGE: Table grapes are picked when mature, judged by (a) color and condition of the cluster stem (top brown and woody) (b) taste (c) color of berries. It is usually necessary to go over a vine three or more times in order to harvest table grapes at the proper stage. Grapes for raisins may be left longer on the vine for heavier yield.

Recommended packaging for fresh Vinifera grapes are 7.8 kg. boxes which are usually vibrated after packing in order to avoid a loose-pack condition.

Seedless grapes can easily be stored for 1-2 1/2 months at 0° C. For longer storage (up to four months) they are fumigated with SO₂ for mold control.

SOURCES OF INFORMATION: The US National Plant Germplasm System, 10300 Baltimore Avenue, Beltsville, Md. 20705-2350 maintains a computerized information system on cultivars. It has established a Grape Advisory Committee of which the current membership is attached:

Dr. Kathleen Rigert
Curator, National Clonal Germplasm Repository
University of California
Davis CA 95616

Dr. Carole Meredith
Department of Viticulture & Enology
University of California
Davis CA 95616

Mr. David Adelsheim
Adelsheim Vineyard
22150 NW Quarter Mile Lane
Newburg OR 97132

Dr. Howard J. Brooks
USDA, ARS
Room 236, Building 005
10300 Baltimore Ave.
Beltsville MD 20705-2350

Dr. David Cain
Superior Farming
16350 Driver Road
P.O. Box 80298
Bakersfield CA 93380

Dr. Helen Fisher
Department of Horticulture
Horticultural Research Institute of Ontario
Vineland Station, Ontario
Canada LOR2E0

BEST AVAILABLE COPY

Mr. Philip L. Forsline
Horticulturalist/Curator
National Clonal Germplasm Repository
Plant Genetic Resources Unit
New York State Agric. Exp. Station
Geneva NY 14456-0462

Mr. Phil Freese
Mondavi Winery
P.O. Box 106
Oakville, CA 94562

Mr. Rich Gahagan
Room 4217 - Federal Building
1130 "O" Street
Fresno CA 93721

Dr. Deborah Golino
Department of Plant Pathology
University of California
Davis CA 95616

Dr. Stephen Kresovich
Supervisory Geneticist
Regional Plant Introduction Station
New York State Agric. Exp. Station
Geneva NY 14456-0462

Dr. Richard Kunde
Sonoma Grapevines
519 Dennis Lane
Santa Rosa CA 95401

Dr. James Luby
Department of Horticultural Science
305 Alderman Hall
University of Minnesota
St. Paul MN 55108

Dr. Roger Pearson
Department of Plant Pathology
New York State Agric. Exp. Sta.
Geneva NY 14456

Dr. Bruce I. Reisch
Department of Horticultural Sciences
New York State Agric. Exp. Sta.
Geneva NY 14456

Dr. Andrew Walker
Dept. of Viticulture & Enology
University of California
Davis CA 95616

Dr. Tony Wolf
Virginia Tech
2500 Valley Ave.
Winchester VA 22601

Dr. Wade Wolfe
P.O. Gox 9068
Yakima WA 98909

BEST AVAILABLE DOCUMENT

ANNEX II:
Fig Culture

5/2

BEST AVAILABLE DOCUMENT

ANNEX II: FIG CULTURE

The fig is a deciduous subtropical tree which loses its leaves for only a very short winter period. It is a native of the arid semi-desert regions of the Old World where successful culture is limited more by low temperatures of winter than by high heat of summer. Vigor of the fig tree can be controlled by cultural methods, particularly irrigation, so that it can withstand extremes of heat without serious injury to fruit quality. While fig trees may bear as early as the fourth season, commercial bearing starts at about seven years of age.

VARIETIES: There are four general types of figs (a) the largely inedible caprifig (b) Smyrna, (c) White San Pedro and (d) the common types. Of the edible varieties, only the common types produce pollen. The Smyrna and some of the White San Pedro types will mature only after their flowers have been pollinated. This is accomplished by the fig wasp which carries the pollen from the June crop of caprifigs to the edible fig. Man modifies the normal life history of these figs by placing mature June-crop caprifigs in perforated bags of edible types of figs and thus causes the pollen-dusted wasps to enter them.

Common types of figs (Mission, Adriatic, Kadota, Brunswick, Celeste and Brown Turkey) and some of the San Pedro types (e.g., King) are parthenocarpic. Because of the complexities described above, these are the only types of figs which could be recommended for introduction in Panjgur District at this time.

CULTURE: The only method of propagation used is rooted woody cuttings. Cuttings are made during the pruning season in January and February. Bundles of the cuttings are placed butt end up in a well-drained trench and covered with several inches of sandy soil. They are set in the nursery in March and the soil kept moist to maintain steady growth.

The fig normally bears two crops each year -- the first crop appearing on wood of the previous season, and the second crop on new wood of the current season's growth. Since the fruiting habits of different figs vary, they are pruned differently. For example, the Mission tree is unproductive under a system of heavy pruning while the Turkey and Kadota usually produce best under such a pruning treatment. All varieties require an occasional thinning out and heading back of the top to stimulate a succession of vigorous wood on the main framework branches, and to help prevent early decline of the tree. Thus an advantage of fig culture is that the prunings could be used for propagation.

Irrigation of fig orchards is necessary except where there is a relatively high water table.

USES: The Adriatic and Smyrna varieties are the principal drying figs. Large tonnages of the Kadota are also being dried. The Mission is an excellent fig both fresh and dried but the black

color is objectionable to the baking trade. Turkey and Brunswick are worthless as dried figs. Celeste is eaten only fresh. A new seedling fig, Conadria is showing promise for both fresh and dried fruit markets (see reference by Condit for detailed descriptions of these and other varieties).³⁰

SOURCES OF INFORMATION: The US National Plant Germplasm System, 10300 Baltimore Ave., Beltsville MD 20705-2350 maintains a computerized information system on fig cultivars. It has established an Advisory Committee on Tropical Fruit-Nut Commodities, the current members of which are listed below:

Dr. Mary Lu Arpia
Dept. of Botany & Plant Sciences
University of California
Riverside, CA 92521

Dr. Duane P. Bartholomew
Department of Agronomy & Soils
University of Hawaiï
3190 Maile Way
Honolulu HI 96822

Dr. Gary Bender
Farm Advisor, Phytopathologist
Building 4, 5555 Overland Avenue
San Diego, CA 92123

Mr. Robert C. Brokaw
P.O. Box 4818
Saticoy CA 93003

Dr. Howard J. Brooks
USDA, ARS
Room 236, Building 005
10300 Baltimore Ave.
Beltsville MD 20705-2350

Dr. Carl W. Campbell
Tropical Research & Education Center
18905 SW 280th Street
Homestead FL 33031

³⁰ Childers, N.F. Modern Fruit Science, (Eighth Edition) 1978; Scheer, A.H. and E.M. Juergenson Approved Practices Fruit and Vine Production (Second Edition) 1976; California Agriculture. This monthly publication from the University of California, Berkley contains progress reports on fig research, and discusses use of growth hormones; Condit, I.J. Fig Varieties *Hilgardia* 23: 11 323- 358 February 1989; Condit, I.J. and J. Enderud A Bibliography of the Fig *Hilgardia* 25: 1-663 July 1990; Davis, C.S. "Pest and Disease Control Program for Figs" (published frequently) Calif. Ag. Exp. Sta. Leaflet 70.

Dr. Arturo Cedeno-Maldonado
Department of Horticulture
University of Puerto Rico
Mayagüez PR 00708

Dr. C.L. Chia
Department of Horticulture
University of Hawaiï
3190 Maile Way
Honolulu HI 96822

Dr. Norman F. Childers
Fruit Crops Department
University of Florida
Gainesville FL 32611

Dr. Norm Ellstrand
Dept. of Botany & Plant Sciences
University of California
Riverside CA 92521

Mr. George Emerich
152 South Stagecoach Lane
Fallbrook CA 92028

Dr. Heber Inizarry
Tropical Agriculture Research Station
P.O. Box 70
Mayagüez PR 00708

Dr. Phillip J. Ito
College of Tropical Agriculture
University of Hawaiï
461 W. Lanikaula Street
Hilo HI 96720

Dr. Robert J. Knight
Subtropical Hort. Research Sta.
13601 Old Cutler Road
Miami FL 33158

Dr. Richard Manshardt
Department of Horticulture
University of Hawaiï
3190 Maile Way
Honolulu HI 96822

Mr. Reed Olszack
25000 SW 187th Avenue
Homestead FL 33031

Dr. John Popenoe
Director, Fairchild Tropical Garden
10901 Old Cutler Road
Miami FL 33156

BEST AVAILABLE DOCUMENT

Dr. Raymond J. Schnell
Curator, National Clonal Germplasm Repository
13601 Old Cutler Road
Miami FL 33158

Dr. Enrique Gonzalez Tejera
Graciela G-18
Park Gardens
Rio Piedras PR 00928

Mr. Francisco Vazquez
Tropical Agric. Research Station
Box 70
Mayagüez PR 00709

Mr. Steven White
President
Calflavor Inc.
440 Andressen
Escondido CA 92025

Mr. Tim Williams
Curator, National Clonal Germplasm Repository
1060 Pennsylvania Avenue
Riverside CA 92507

Dr. Francis T. Zee
Curator
National Clonal Germplasm Repository
P.O. Box 4487
Hilo HI 96720

BEST AVAILABLE DOCUMENT

ANNEX III:

Pomegranate Culture

BEST AVAILABLE DOCUMENT

550

ANNEX III: POMEGRANATE CULTURE

Pomegranate trees perform best in hot, dry climates and have low chill requirements. But quality is low if pomegranates are not exposed to chilling before harvest. They thrive on a wide range of soils, even those somewhat saline, and respond to nitrogen fertilizer.³

CULTIVARS: There are a number of native pomegranate cultivars. Pink (sour), white (sweet) and seedless varieties are grown in Pakistan. The Wonderful cultivar is recommended by the authorities cited above.

CULTURAL REQUIREMENTS: Pomegranates are propagated from cuttings and can be top-worked by grafting or budding. The fruiting tree requires a high, steady water supply. If the water supply is uneven, the fruit tends to split before it ripens.

Light annual pruning is necessary to maintain production of large, good quality fruit. In addition, dead wood and interfering branches must be removed each winter.

HARVEST AND STORAGE: Fruit is picked in the fall after it has changed color and will continue to ripen after picking. But best-quality pomegranates are picked only after exposure for several days to temperatures of 2° or lower. If picked before full color, pomegranates may split in storage. They can be kept up to three months in a cool, dry place; and much longer under cold storage. If the skin is damaged, pomegranates are very susceptible to rot in storage.

CONCLUSION: Pomegranates are not recommended for cultivation in Panjgur because chilling there is insufficient to permit their flavor to develop. In addition, current water management practices in Panjgur District induce extensive splitting.

³: Childers, N.F., Modern Fruit Science Eighth Ed. Rutgers University 1978; J.I. Rodale, How to Grow Fruits and Vegetables by the Organic Method (6th ed.) Rodale Press 1970.

ANNEX IV:
Fruit Drying Practices

BEST AVAILABLE DOCUMENT

562

ANNEX IV: DRYING TECHNIQUES

Dried fruits represent an important segment of the food processing industry. Apples, apricots, figs, peaches, pears, prunes and raisins are the important dried fruits. The United States is the largest producer of dried fruits; other important producers are Australia, Argentina, Chile, Egypt, Greece, Iran, Iraq, Portugal, Spain, South Africa, Turkey and Yugoslavia (see table).

PREDRYING TREATMENTS: A brief outline of predrying treatments applied is: (1) Selection and sorting for size, maturity and soundness. (2) Washing. (3) Peeling by hand, lye solution or abrasion. (4) Cutting into halves, wedges, slices, cubes, nuggets, etc. (5) Alkali dipping, used for raisins, grapes and prunes. (6) Sulfuring.³² All of these operations can be performed manually on a small scale.

SULFURING: For many years sulfur dioxide (SO_2) has been used as an additive to preserve the color of dried fruits, for its antioxidant and preservative effects. In addition to preventing enzymatic browning, SO_2 treatment reduces destruction of carotene and ascorbic acid which are important nutrients of fruits. Sulfite solutions are less suitable than burning sulfur because the solutions penetrate the fruit poorly, and also leach its natural sugar, acid and flavor components.

In the United States, several sulfite salts and SO_2 are classed by the Food and Drug Administration as generally recognized as safe (GRAS). But important marketing countries such as Germany and Japan have regulations that substantially limit the use of SO_2 in low-moisture fruits. Alternatives include citric or other organic acids, application of artificial heat, and use of ascorbic acid, tocopherols, cysteine, glutathione and osmotic treatment. These latter methods of treatment are probably too expensive and sophisticated for use in Pakistan at this time. According to traders interviewed, Afghan producers apply an unidentified chemical (probably a sulfite salt) to grapes when making sultana (white) raisins. Those observed were very uneven in color.

Control of the level of SO_2 , which is usually set in the finished product specifications, varies as a function of piece size, type and maturity of the fruit, drying method -- and above all, as a

³² For a detailed description of the preparation and equipment used for fruit preparation prior to processing, see Woodruff, J.G. and B.S. Luh Commercial Fruit Processing AVI Publishing Co. 1975.

direct function of the fresh fruit soluble solids level. This last increases 200 ppm SO₂ per degree Brix. Usual levels of SO₂ that are desirable in dried fruits are as follows:

<u>Fruit</u>	<u>Ppm</u>
Apples	1000-2000
Apricots	2000-4000
Peaches	2000-4000
Pears	1000-2000
Raisins (bleached)	1000-1500.

Sun-drying implies some overdrying and contamination by dirt and insect infestation; but generally it will allow the products to dry to 15-20% moisture level. Other low-cost drying systems are available. ³³

Shelf life of dried fruit products is short unless they are immediately packaged in air-tight containers with an in-package desiccant -- a chemical having an extremely high affinity for water, such as calcium and magnesium chlorides and sodium and potassium hydroxides. The hygroscopic compound is separated from the food by a permeable bag.

Thus stored, dried fruits may be held for a year or more at 70° F without sugaring or loss of color or flavor.

³³ "System Dehydrates Difficult Products" (A low-cost, energy-efficient system dehydrates a wide range of fruits and vegetables) Food Engineering September 1991

ANNEX V:

List of Members, All Pakistan Fruit &
Vegetable Exporters, Imports &
Merchants Association

58a

BEST AVAILABLE DOCUMENT

**ANNEX V: LIST OF MEMBERS, ALL PAKISTAN FRUIT & VEGETABLE
EXPORTERS, IMPORTERS & MERCHANTS ASSOCIATION**

Kathiawar Trading Co. 8-New Onion & Potatoes Mrt. University Rd., Karachi Yusuf A. Rehman	Path Traders Sc-22 Opp.: Lyari Station Maripur Road, Karachi Mr. Sultan
Usman Khan & Co. 1/5 Jafar Square Recorder Road, Karachi Usman Kahn	Overseas Impex Sc-22 Opp.: Lyari Station Maripur Road, Karachi Mr. Anwar
Sadaf International 6-New Onion & Potatoes Mrt. University Road, Karachi Haji Mohd. Siddique	Usman & Sons M.11,P/174,A/1, Block 'B' Atmaram Pritamadas Rd. Karachi Mr. Usman
M Yusuf & Sons 7-New Onion & Potatoes Mrt. University Road, Karachi Abdul Khaliq	Mohd. Rafiq & Co. 9-New Onion & Potatoes Mrt. University Road, Karachi Haji Mohammad Rafiq
Mohammad Dawood & Sons 147-Fruit Market University Rd., Karachi Ibrahim Nagri	Haji Mohd. Ishaque & Sons 12-New Onion & Potatoes Mrt. University Road, Karachi Mohammad Mustaque
Jawad Enterprises 2/8-New Onion & Potatoes Mrt. University Road, Karachi Mohd. Sadiq	S.M. Karim & Sons 5-New Onion & Potatoes Mrt. University Road, Karachi Haji Abdul Razzakkath
Haji Ghabruddin & Co. 917 - P.I.B. Colony, Karachi Haji Ghabruddin	Qazi Mohd. Qahir Manzoor 4-New Onion & Potatoes Mrt. University Road, Karachi Haji Manzoor Ahmad
Baluchistan Fruit Co. Meewa Market, Quetta Haji Abdul Mannan	Ghafoor Bhi Rahim Bhat & Sons 49-Fruit Market Hyderabad, Sind Suleman Bhai
Mulki Muslim Store Subzi-Mandi, Quetta Haji Abdul Azim	Mohd. Ikram Nizamuddin & Co. 3816-New Subzi Mandi, Multan Chawdry Mohd. Ikram
Malik Abdul Sattar & Co. Shop No. 53-A New Subzi Mandi Lahore Malik Abdul Sattar	Eshake & Co. 505-Newnaham Road, Karachi Ismail Kassam Modi
China Traders Sc-22, Lyari Station Maripur Road, Karachi	Al-Shama & Co. S/22, Maripur Road, Karachi Mohammad Iqbal

Sharif Asghar Rathore (Pak) Ltd. Ravi Road, P.O. Box 1088, Lahore Sharif Asghar Rathore	Ahmad Khan Mohd. Khan & Co. 834-P.I.B. Colony, Karachi Ahmad Kahn
Gulam Hyder Tariq Mehmood Shop No. 60-New Fruit Market Quetta Gulam Hyder	Qayamuddin/Nizamuddin 1084 P.I.B. Colony, Karachi Mr. Nizamuddin
Azam Jan Abdul Habib Shop No. 13, New Fruit Market Quetta Mohammad Naem	Ch.Abdul Haq Mohd. Shafi Subuza-Mandi, Okara Ch.Abdul Haq., Mohd. Shafi
Haji Nazar Mohd. Mohd. Naem Shop No. 7-New Fruit Market Quetta Mohammad Naem	Mohd. Ibrahim Dawood Ahmad Subzi-Mandi, Hyderabad Mahmood Ahmad
Madina Fruit Company Shop No. 20/21 New Fruit Market Quetta Mohammad Akram	Syed Abdul Ali Syed Abdul Haleem 1006 P.I.B. Colony, Karachi Mr. Nafeh
Haji Mohd. Zarif & Bros. Shop No. 64 New Fruit Market Quetta Mohammad Zarif	Syed Brothers 1130 P.I.B. Colony, Karachi Syed Ray Mohammad
Malik Ghulam Hyder & Bros. Shop No. 30 Fruit Market, Quetta Malik Ghulam Hyder	Aziz-Ul-Rehman Mehmood Ahmad Subzi-Mandi, Hyderabad Aziz-Ul-Rehman
Haji Gul Alam Ch. Ali Ahmad 922 P.I.B. Colony, Karachi Abdul Wahid	Hasam & Co. 131 Fruit Market, Karachi Haji Hasam
Amin & Co. Adv. Bldg., Marriot Rd., Karachi Mohammad Mustaque	Mohd. Ansar, Mohd. Afsar 236 Fruit Market, Karachi Mohammad Ansar
Ch. Abdul Rehman & Co. 193 Subzi Mandi Country Club Road, Karachi Abdul Rehman	Mohd. Ashfaq, Mohd. Afzal 208 Fruit Market, Karachi Mohammad Ashfaq
Ch. M. Younus Haji M. Yusuf 241 Fruit Market University Road, Karachi Chawdry Mohd. Younus	Suleman Allahraka 132 Fruit Market University Road, Karachi Haji Iqbal

BEST AVAILABLE DOCUMENT

Mohd. Anwar Mohd. Sarwar 54 Empress Mrt., Saddar, Karachi Mohammad Anwar	Jahga & Co. 4 New Fruit Market University Road, Karachi Haji Iqbal
Sind Punjab Fruit Company 923 P.I.B. Colony, Karachi Mohammad Khan	Zeeshan & Co. 153 Fruit Market, Karachi Mohammad Iqbal
Khan Mohd. Fateh Mohd. & Co. 834 P.I.B. Colony, Karachi Khan Mohammad	Abdul Aziz, Abdul Hamid 155 Fruit Market, Karachi Abdul Aziz
Mohd. Anwar Fruit Market University Road, Karachi Haji Mohd. Anwar	Haji Sheikh Bindu, M. Yusuf 10 New Onion & Potatoes Mrt. University Road, Karachi Haji Mohd. Yusuf
Shahbuddin & Sons 160 Fruit Market University Road, Karachi Shahbuddin	Leh J. Shipping Agency G.K. 14/15 Sakina Mansion G. Allana Rd., Kharader, Mr. Karachi Mohammad Munaf
Malik Abdul Ghafoor & Co. 239 Fruit Market University Road, Karachi Malik Abdul Ghafoor	Abdul Jabbar & Brothers 935 P.I.B. Colony, Karachi Abdul Jabbar
Haji Gudar Hafiz A. Rahim 234 P.I.B. Colony Ch. Abdul Qayum	Muslim Shop Shop No. 5 B-2519/1/1 Shaheed Gunj, Sukkar Abdul Rehman
Quddus Abdul Malik 234 P.I.B. Colony Karachi Abdul Quddus	Al-Mairaj Enterprises A-139/140 New Scheme Mohanpura Rawalpindi Aamir Saleem
Noman Kashif Impex G.K. 14/15 Sakina Mansion G. Ablana Road, Kharader Abdul Ghani Yusuf	S.A. Shakoore & Co. Subzi-Mandi, Hyderabad Ismail A. Ghani
Haji Syed, Hohd. Khan Haji Shah 828 P.I.B. Colony, Karachi Shah Mohammad Khan Haji Suleman Adam Kothari & Co. 49/1 Khorl Garden, Karachi Suleman Kothari	Haji Ibrahim Umer Subzi-Mandi, Hyderabad Haji Jan Muhammad Ghulam Mehar Shah Din & Co. 34 New Subzi-Mandi, Lahore Mohammad Saed
Universal Impex Ali Bhai Building No. 1 Muljee Street, Karachi Abdul Rafiq	Javed & Co. Plot No. 04, Sector 1/11 Islamabad Mohammad Javed

Haji Ahmad Habib Modi & Co.
11 New Onion & Potatoes Market
University Road, Karachi
Mr. Haji Ahmad

Abdullah Jan & Co.
2266 P.I.B. Colony, Karachi
Abdullah Jan

Gulam Hussain & Co.
Shop No. 23/A Subzi-Mandi
Multan
Gulam Hussain

Mullah Abdul Majeed, Aziz Ahmad
212 Fruit Market
University Road, Karachi
Abdul Aziz

Yusuf Ali M. Usman Bhatti
Sukkar Flour Mills Bldg.
C/2 S.I.T.E. Hyderabad
Yusuf Ali M. Usman Bhatti

Hamza Brothers Impex
54/12 Old American Centre
Kashmir Rd., Rawalpindi
Mohammad Ilyas

Mohammad Ramzan Shah & Bros.
1170 P.I.B. Colony, Karachi
Abdul Malik

Golden Rose Valley - Swat
Enterprises
Village Sinpora, P.O. Matta
Rawalpindi
Hafiz Mohammad Ilyas
Mr. Obaidullah

Ebrahim Haji Mohammad
149 Subzi Mandi
University Road, Karachi
Ebrahim Haji Mohd.

Wasim Enterprises
Ne-974 St. No. 05
Muhallah Hukamdad, Rawalpindi
Ahamad Din

Shafaq Impex (Pvt) Ltd.
Shafaq Palace
59-B S.M.C H.S. Karachi
Rafiq Lakhani

Abdul Sattar & Co.
Plot No. 235, Sbuzi-Mandi
Karachi
Abdul Sattar

Green Valley Traders &
Consultants (Pvt) Ltd.
House No. 39, Street 28
F-8/1 Islamabad
Syed Muzaffar Ali

Malik Mehmood & Co. (Pvt) Ltd.
Silli (Chattar) Tehail Murree
Dr. Malik Mehmood Ahmad Khan

Combi International (Pvt) Ltd.
409 Poonch House Complex
107 Adamjee Rd. P.O.Box 1179
Rafi Uddin Khan

Ch. Baba Ismail, Mhd. Yasin
Fruit & Vegetable Market
1-11-4 Islamabad
Hafiz Abdul Waheed

Azad Fruit Company
28/29 New Fruit Market
Rawalpindi
Tariq Ayub

Baba Mohd. Nazir & Sons
119 New Subzi Mandi

Distt: Swat

Malik Mohd. Iqbal,
Mohd. Yusuf & Co.
108 New Vegetable Market
Islamabad
Azmt Ali

Havez Mohd. Ayub & Co.
48/49 New Fruit Market
Rawalpindi
Mohammad Siddiq

Munir & Company A/308 Jinnah Road P.O. Box 1290, Rawalpindi Mohammad Rashid	Azdullah Khan Ch. Abdul Khan 2 New Fruit Market Islamabad Abdul Khaliq
International Trade Promoters 2078/Jail Road, 23 P.I.B. Colony Karachi Syed Abbas Haider	Haji Mohd. Anwar & Sons 85 New Fruit Market Islamabad Haji Mohd. Anwar
Comforta (Pvt) Ltd. 250 I/9 Industrial Area Islamabad Ehsan-Ul-Haq	Chawdri Mohd. Yakub, 75/76 New Subzi Mandi Islamabad Abdul Basif
A & Q Brothers 3/88 Sir Syed Road Lalchandabad, MirpurKhas Syed Afzal Hussain	Chowdri Mohd. Ishaq Mohd. Ilyas & Co. 12/13 New Fruit Market Islamabad Ch. Mohd. Ishaq
Sind Fruit Processing (Pvt) Ltd. 4/2 Sector 15, Korangi Industrial Area, Karachi Alfredearnest Pate	Ch. Mohd. Nawaz Mohd. Shabaz Fruit Market, Lahore Mohd. Shabaz
Mohd. Din, Mohd. Saleem 7 New Fruit Market Islamabad Mohd. Abid	Mohd. Farooque & Sons 84/85 Fruit Market, Ravi Link Lahore Mohd. Farooque
Siraj Brothers & Co. 45 New Fruit Market Islamabad Mohd. Jamil	Haji Mohd. Khan & Co. 37 New Fruit Market, Ravi Rd. Lahore Mohd. Khan
Mia Mohd. Salim, Mohd. Aslam Dry Fruit Market, Aari Gali Namak Mandi, Rawalpindi Mohammad Saleem	Ch. Mohd. Din Mohd & Co. 41 Fruit Market Ravi Link Lahore Abdul Hafez
Haji Qamardin Khiardin New Fruit Market, Quetta Mr. Khiardin	Abdul Rashid, Abdul Majid Sons Meewa Mandi, Faisalabad Abdul Rashid
Mohd. Younus, Mohd. Ishaq 77 Fruit Market, Lahore Mohd. Ishaq	Mohd. Asghar, Zaherudin Babar Meewa Mandi, Faisalabad Zahiruddin Babar
Haji Abdul Majeed, Mohd. Shafiq 28 Fruit Market, Lahore Abdul Majeed	Mohd. Shabaz, Mohd. Ilyas Meewa Market, Faisalabad Mohd. Shahbaz

Abdul Hamid, Abdul Mahid
Shop No. G-2 Fruit Market
Lahore
Abdul Hamid

Taz & Co.
Subzi-Mandi, Faisalabad
Said Yasin

Haji Mohd. Yakub, Haji Mohd. Ishaq
Fruit Market, Lahore
Bashir Ahmad

Ithad Fruit Company
New Subzi Mandi, Multan
Abdul Hamid Qureshi

Haji Noor Elahi & Sons
99 Fruit Market, Ravi Link
Lahore
Mohd. Yusuf

Imam Ud Din, Karim Ud Din
Subzi Mandi, Multan
Imam Ud Din

Ch. Mohd. Hussain,
Haji Munawar Hussain & Co.
70 Fruit Market, Lahore
Mohammad Hussain

Hadji Islamudd Wahain Sons
New Fruit Market, Multan
Ch. Nizamuddin Wahain

Haji Meraj Din Mohd. Aslam & Co.
64 New Fruit Market, Link Rd.
Lahore
Mohd. Sohail

Ghulam Farid, Mohd. Azim
New Fruit Market, Multan
Mohd. Azim Qureshi

Mohd. Din, Mohd. Yasim
56 Meewa Mandi, Lahore
Ch. M. Saed

Mullah Sardar Mohd. & Sons
Shop No. 6, New Subzi-Mandi
Lahore
Mullah Sardar

Sadiq Mohd. Khalil Bhatti
58 Subzi Mandi, Lahore
Mond. Khalil Bhatti

Abdul Haq Rafiq
Subzi mandi, Okara
Liaquat Ali

Ashraf Bhatt & Co.
10-A New Subzi Mandi, Lahore
Zuifizar Ali

Sabri & Co.
New Subzi Mandi, Multan
Haji M. Ghafoor

Mohd. Amin & Co.
45 New Subzi Mandi, Lahore
Zuifizar Ali

Haji Abdul Ghafoor, Naseer
Ahmad & Co.
New Subzi-Mandi, Multan
Haji M. Ghafoor

Haji Mohd. Rafiq & Sons
27 Subzi-Mandi, Lahore
Anwar Elahi

Mohd. Riaz, Mohd. Maveed & Co.
New Fruit Market, Multan
Mr. Riaz

Mohammad Sohail, Mohammad Saeed
34-B New Subzi Mandi, Lahore
Mohammad Sohail

Mhd. Chamadin Hai Mohd. Zafar
New Fruit Market, Multan
Mohammad Zafar Ali

BEST AVAILABLE COPY

Mahnga Mohd. Tufail Shop No. 2, Subzi Mandi Faisalabad Abdul Latif	Mohammad Waheed, Mohammad Saeed & Co. New Subzi Mandi, Multan Mohd. Waheed
Khuddam Enterprises Street No. 4, Rauza Park Mansoorabad, Faisalabad Abdul Latif	Haji Nawab Ali, Haji Abdul Subzi Mandi, Multan Mohammad Hasan Ali
Haji Mohd. Hanif, Mohd. Tufail Co. Subzi Mandi, Okara Haji Shafi	Haji Allauddin, Mohd. Safdar New Subzi Mandi, Multan Mohammad Safdar
Haji Mian Umer Din & Sons Subzi Mandi, Okara Mohd. Afzal	Ch. Din Mohd. Haji Fayed Anwar New Subzi Mandi, Multan Din Mohammad
Ali Mohd. Wali Mohd. & Co. Subzi Mandi Okara Nishan Ali Mohd.	Shaikh Brothers 935 Station Road, Gari Khata Hur Mohalla, Hyderabad Younus Shaikh
Mohd. Boota Meraj Din Subzi Mandi, Okara Meraj Din	Ch. Nazir Ahamad, Mohd. Iqbal Subzi Mandi, Gujranwala Mohd. Iqbal
Haji Tajdin, Mohd. Ashraf & Co. Subzi Mandi, Okara Mohd. Ashraf Aslam	Ch. Omer Din & Sons Subzi Mandi, Gujranwala Mr. Ramzan
Ch. Sardar Mohd. & Sons Subzi Mandi, Okara Mohammad Aslam	Yusuf & Sons Subzi Mandi, Gujranwala Mohd. Aslam Chawdhry
Ditta & Co. Fruit Market, Guetta Mr. Ditta	

ANNEX VI:

Marketing Costs & Margins, Quetta to
Karachi

ANNEX VI: MARKETING COSTS & MARGINS, QUETTA TO KARACHI

The following data, expressed in units of one ten-kg. crate, are for grapes of the Sabzu variety, produced in Quetta District and marketed in the Karachi Fruit Market as of the first week of October 1991.

	<u>Rupees</u>
CONTRACTOR/WHOLESALE FROM QUETTA:	
Sale Price to mashkahor	190.00
Expenses	
Purchase price from grower	45.00
Harvest cost	3.47
Freight to Karachi	17.00
Cost of crate	12.00
Octroi at Karachi & Market Committee fee	0.95
Labor for loading/unloading	2.35
Miscellaneous (food and lodging)	1.00
Commission to auctioneer	13.30
Total expenses ³⁴	95.07
Margin	94.93
 RETAILER (MASHKAHOR):	
Sale price to retail merchant	245.00
Expenses	
Purchase price	190.00
Miscellaneous	15.00
Total expenses	205.00
Margin	40.00
 RETAIL MERCHANT:	
Sale price to consumer	300.00
Expenses	
Purchase price from mashkahor	245.00
Rental of shop (Rs. 500/month)	0.17
Labor	2.00
Assistant	0.51
Transport	5.00
Miscellaneous	2.00
Total expenses	254.68
Margin	45.32

³⁴ For details, see Marketing Costs and Margins, Chapter II.

For details, see Marketing Costs and Margins, Chapter II.

For details, see Marketing Costs and Margins, Chapter II.

ANNEX VII:

Marketing Costs & Margins, Quambrani to
Quetta

BEST AVAILABLE DOCUMENT

66a

ANNEX VII. MARKETING COSTS AND MARGINS, QUAMBRANI TO QUETTA
 The following data, expressed in units of one eleven kg. crate, are for grapes of the Kishmish variety produced in Quambrani (7 km. from Quetta) and marketed in the city of Quetta, as of the first week of October 1991.

CONTRACTOR		<u>Rupees</u>
Sale price to wholesaler		150.00
Expenses		
Purchase price from grower		65.00
Harvest cost		25.00
Freight to Quetta		3.50
Cost of crate		14.00
Packing materials		2.00
Octroi at Quetta		0.40
Labor for unloading		1.00
Commission to auctioneer		15.00
Total expenses		125.90
Margin		24.90
WHOLESALER		
Sale price to retailer		190.00
Expenses		
Purchase price from contractor		150.00
Total		0.03
Total expenses		150.03
Margin		39.97
RETAILER		
Sale price to consumer		279.50 ⁴
Expenses		
Purchase price from wholesaler		190.00
Labor for transport to shop		1.50
Total		0.09
Total expenses		191.59
Margin		87.91

Rupees per month	
Rent of shop	2500
Assistant	3000
Other labor	3000
Miscellaneous	5000
Total	13500.

¹ Average turnover Rupees 350,000/month. Assumes 10% of total expenses are for grapes.

² Clean grapes 3.5 kg. @ Rs. 27/kg.
 Damaged grapes 2 kg. @ Rs. 15/kg.
 Spoiled grapes 1/2 kg.

Rupees per month	
Rental of shop	2000
Assistant	3000
Miscellaneous	500
Total	5500

³ Range of turnover Rs. 2500 to 3000 per day. Assumes 15% grapes.

BEST AVAILABLE DOCUMENT