



**TRADE DEVELOPMENT AUTHORITY
OF PAKISTAN
GOVERNMENT OF PAKISTAN**



REPORT

ON

EXPORT OF KINNOW



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RESEARCH METHODOLOGY

10. Following identified primary and secondary sources were used to achieve the purpose of this research paper:

Primary sources

Interviews: Keeping in view, the paucity of time only following was identified.

1. Dr. Mazhar Abbas, Head of department, UAF.
2. Dr. Waqar Ahmed, Consultant on Citrus development project
3. Tauseef Tahir, Ph.D. Scholar, UAF

Secondary Sources

1. Published and printed work i. e., books, journals, research work, newspaper articles etc.
2. Internet sources.

RESEARCH OBJECTIVES

The main objective of this paper is to identify supply side issues of production of citrus and proposed the required intervention of the Government of Pakistan. It is also an attempt to explore its export potential and to propose a workable export strategy to enhance the share in global market. The paper will be a source of basic information for the policy makers.

SCOPE OF STUDY

Kinnow is only grown in Pakistan and its aroma and taste has obtained a good reputation and acceptability in the international markets. Unfortunately, the product could not tap the proper global market share due to number of reasons. Untrained and illiterate growers failed to fetch market price besides wasting 30% of fruit due to lack of technique and knowledge. Steps already taken by the government have failed to address the basic issues. This paper is an attempt to identify issues relating to supply side and marketing of Kinnow and to recommend some suggestions to improve production and exports of the same. The research paper has focused mainly the enhancement of export of citrus fruit in general and Kinnow in particular.

REPORT ON EXPORT OF KINNOW

Introduction:

In Pakistan, agriculture is the largest sector which provides livelihood to 44.7 percent of the total labour force. It is because of its central importance in the economy that the Government has identified agriculture as one of the four major drivers of growth. In this sector production of fruit and vegetable plays pivotal role. In fact, the Nature has blessed this country with ideal climate for growing a wide range of delicious fruits and large varieties of vegetables. Over the years, Pakistani experts have developed unique strains of exotic fruit varieties unmatched for their rich flavor and taste. From the selection of the finest fruits grown, a reasonable quantity is processed and properly packed for sales and consumption in local market and exporting abroad.

Pakistan is one of the few countries of the world where fruits grown in cool temperate climate (apples, plums, pears, cherries), warm temperate (apricots, grapes, pomegranates and melon), and subtropical climate (citrus, mango, banana, dates and guava) are available. Pakistan annually produces about 12.0 million tons of fruits and vegetables. Citrus fruit is leading in term of production followed by mango, dates and guava. Fruit and vegetable export trade in Pakistan amounts to US\$ 167 million (2006/07), of which fruits account for US\$ 102.7 million (76.6%), vegetables US\$ 25.7 million (19.2%) and fruit & vegetable preparations (mostly juices) US\$ 5.6 million (4.2%). Their share in Pakistan's total exports is slightly over one percent.

With 2.29 million tons, Pakistan is the 10th largest producer of Citrus in the world. Citrus is cultivated on an area of 193,212 hectares and it is increasing @ 5% annually. Pakistan is also the largest producer of 'Citrus Reticula' variety (Kinnow), this unique variety of citrus is indigenous to this part of the world. According to an estimate approx. 95 percent of the total Kinow produced all over the world is grown in Pakistan. Punjab is the centre of production and supply citrus fruits of high quality and grade. Area under different varieties indicates that about 86 per cent of the citrus is covered by Kinnow variety followed by the Musambi (10 %), Feutral (4%) Blood Red (1%). Kinnow is only grown in Pakistan and

Bhalwal is the main Kinnow producing center. The harvesting season lasts for 4 months, starting from mid December to mid of April. However, according to a rough estimate of industry, approximately 20-40 percent of the produce is wasted during pre & post-harvest stages. Mismanagement of diseases, unfavorable weather, delay in harvesting, absence of proper roads and cold storage facilities, glut formation in the market and other similar factors are responsible for these losses.

Total world trade of citrus fruit during 2008 was US\$10.2 billion and share of Pakistan in this global market remained less than 1% despite 10th largest producer of citrus. However, Pakistan's world mandarin (Kinnow) market share is 1.46 percent. The **total exports** of Kinnow in terms of volume were estimated at **214,765 tons** while in terms of value the total export had fetched **52.92m (US\$)** in 2007-8. Pakistan is exporting only 10% of its total production.

This report focuses on Kinnow export; a brief review of present status and future potential is presented. Factors affecting or limiting the growth are identified. Global trade trends have been analyzed. Major and potential markets have been discussed and export measures have been proposed. Different primary and secondary sources were consulted while collecting data and cross examination method was applied to ensure accuracy. ITC market analysis tools have been used to analyze the global market for Kinnow and to identify potential market for Pakistan.

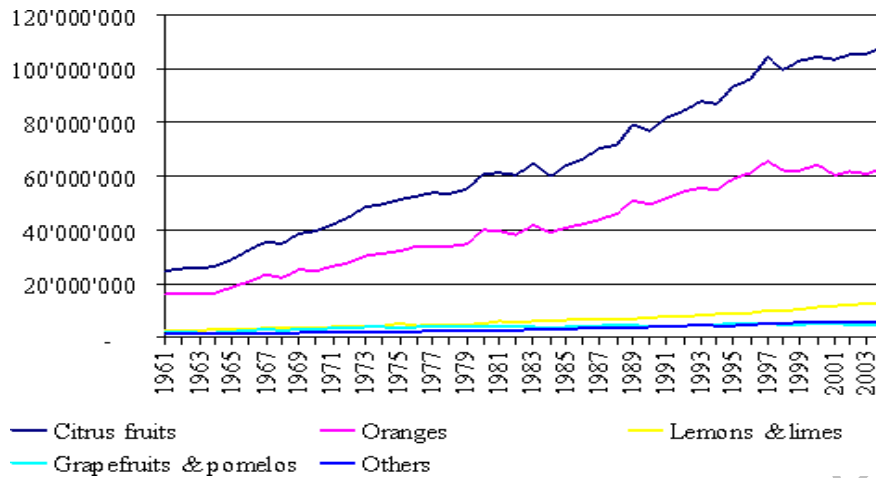
Production:

Citrus fruit (mandarins, Clementine & oranges) is the most important tree fruit crop in the world. It is consumed direct as a fruit as well as juice (fresh & concentrates). Citrus fruits include oranges, mandarins (Kinnow), grapefruit and lemons, of which mandarins (Kinnow) is of significance to Pakistan. Kinnow is a cross between 'King' 'Willow leaf' species of Citrus Fruit, successfully experimented at the Citrus Research Centre, University of California, USA in 1951. Both of these parents have Indo-China origins. The soil and climatic conditions in Pakistan have given 'Kinnow' a unique flavor which distinguishes it from other comparable cultivars (mandarins) grown in the World.

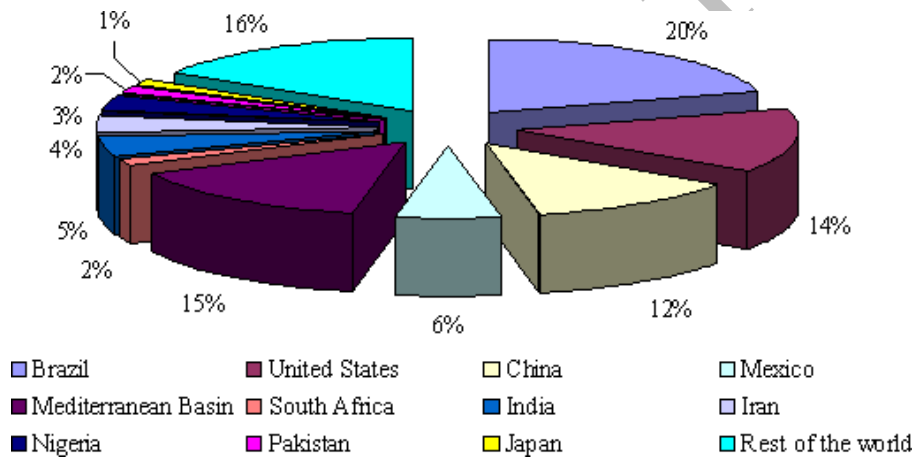
World citrus production in selected major producing countries in marketing year (MY) 2005/06 is estimated at 72.8 million metric tons, a slight increase from the 2004/05 level. The total consists of 47.1 million for oranges, 15.0 million for tangerines, 4.3 million for lemons, 4.0 million for grapefruit, and 2.4 million for other citrus.

Total production and consumption of citrus fruit has grown strongly since the 1980s.

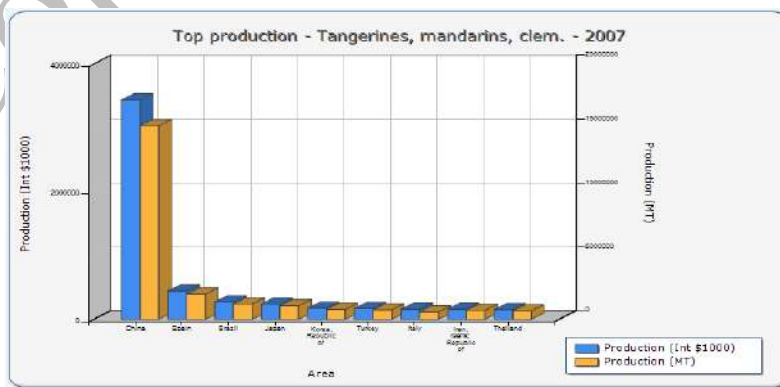
Total production and consumption of citrus fruit has grown strongly since the 1980s. Current annual worldwide citrus production is estimated at over 105 million tons, with more than half of this being oranges. According to the United Nations Conference on Trade and Development (UNCTAD), the rise in citrus production is mainly due to the increase in cultivation areas, improvements in transportation and packaging, rising incomes and consumer preference for healthy foods. This trend is projected to change from 2000 to 2010 since the high production levels have slowed the rate of new plantings. The following graph shows the rising trend in production of different kinds of citrus fruits.



The following figure shows the distribution of production of citrus fruit among different countries in 2006.



As our focus is Kinnow so the follow data will analyze the global mandarin production trend. The leading producers of mandarin are shown below:



Source:FAO

TABLE

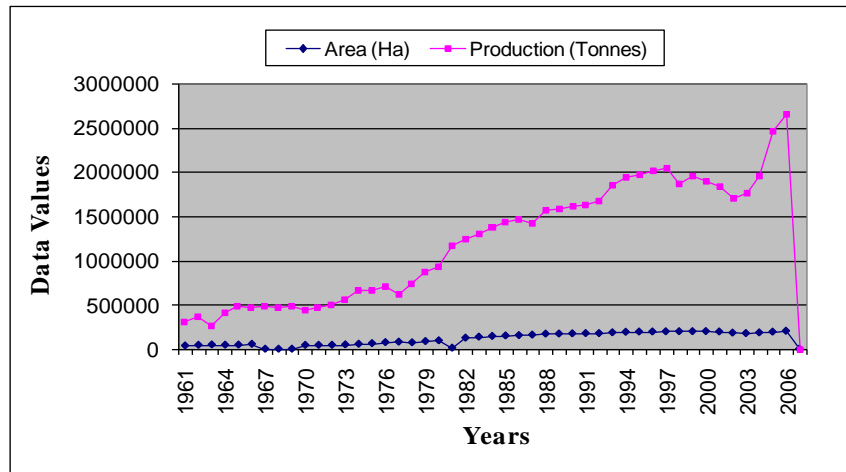
RANK	AREA/COUNTRY	Production (\$ 1000)	Production in MT
1	China	3,438,251.00	15,184,608.00
2	Spain	446,927.00	1,973,800.00
3	Brazil	272,979.00	1,205,580.00
4	Japan	241,374.00	1,066,000.00
5	Korea	176,060.00	777,547.00
6	Turkey	168,540.00	744,339.00
7	Italy	159,119.00	591,526.00
8	Iran	158,953.00	702,000.00
9	Thailand	151,708.00	670,000.00
10	Pakistan	144,915.00	640,000.00

Source:FAO

Above comparison shows that China is the largest producer of mandarin followed by Spain and Brazil. Pakistan stands at 10th position.

Currently, in Pakistan citrus fruits are grown on an area of 193,212 hectares with production of 2.29 million tons annually. Citrus is divided into different groups Sweet oranges, Mandarin, Grape fruit, Lemon and Lime which are being grown commercially. Citrus fruit is grown in all four provinces of Pakistan but Punjab produces over 95% of the crop because of its greater population, favorable growing conditions and adequate water. According to the report of Agriculture Statistics of Pakistan, Citrus cultivation in Pakistan has made great strides, particularly from 1960's onward.

Area and Production of Citrus from 1961-2007



Major Citrus Growing Areas in Pakistan:

Punjab: Distt. Sargodha, Sahiwal, Lahore, Sialkot, Jhang, Minwali, Multan, Gujranwala

NWFP: Mardan, Peshawar, Swat, Swabi, Noshera, Hazzara

Sind: Sukkur, Khairpur, Nawabshah

Baluchistan: Mekran, Sibi and Kech.

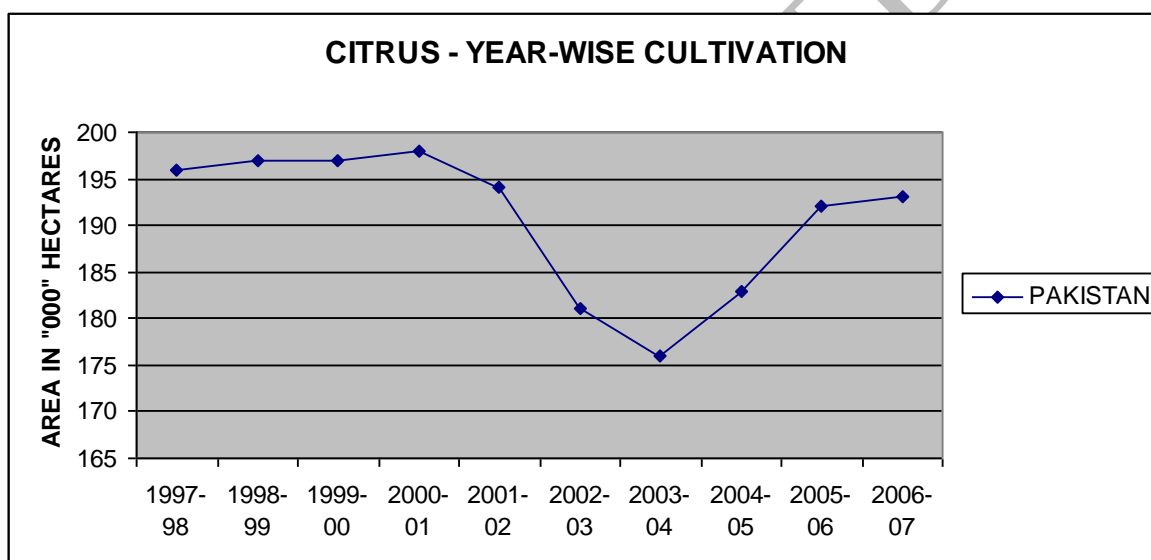
Area and Production of Citrus in Pakistan



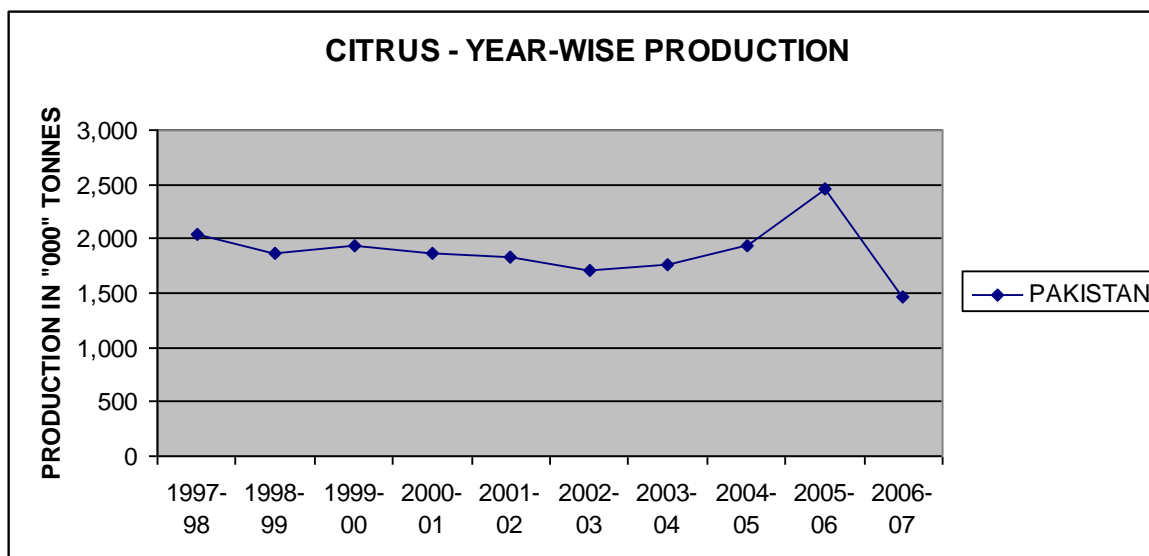
CITRUS - YEAR-WISE CULTIVATION

AREA IN "000" HECTARES

YEAR	PUNJAB	SINDH	NWFP	BALOCHISTAN	PAKISTAN
1997-98	185.40	4.10	4.60	2.00	196.10
1998-99	186.10	4.10	4.70	2.10	197.00
1999-00	186.80	4.00	4.80	2.10	197.70
2000-01	187.60	3.90	4.80	2.40	198.70
2001-02	183.20	4.10	4.50	2.40	194.20
2002-03	170.80	4.10	4.30	2.40	181.60
2003-04	166.60	4.10	4.40	1.30	176.40
2004-05	173.90	4.20	4.40	1.30	183.80
2005-06	182.10	4.40	4.40	1.30	192.20
2006-07	183.30	4.50	4.10	1.30	193.20



Source: Agricultural statistics of Pakistan

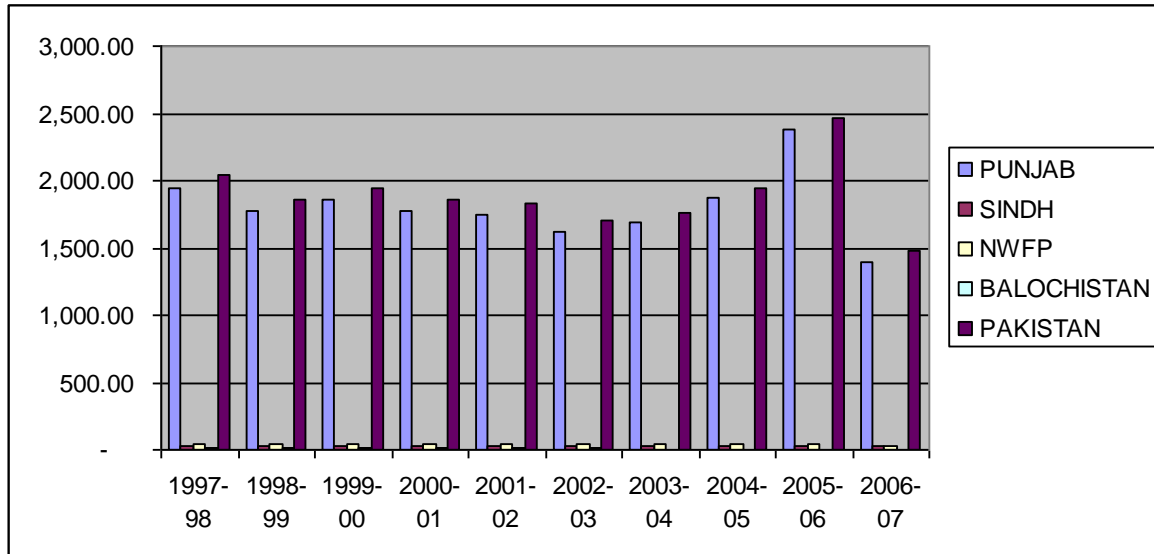


Source: Agricultural statistics of Pakistan

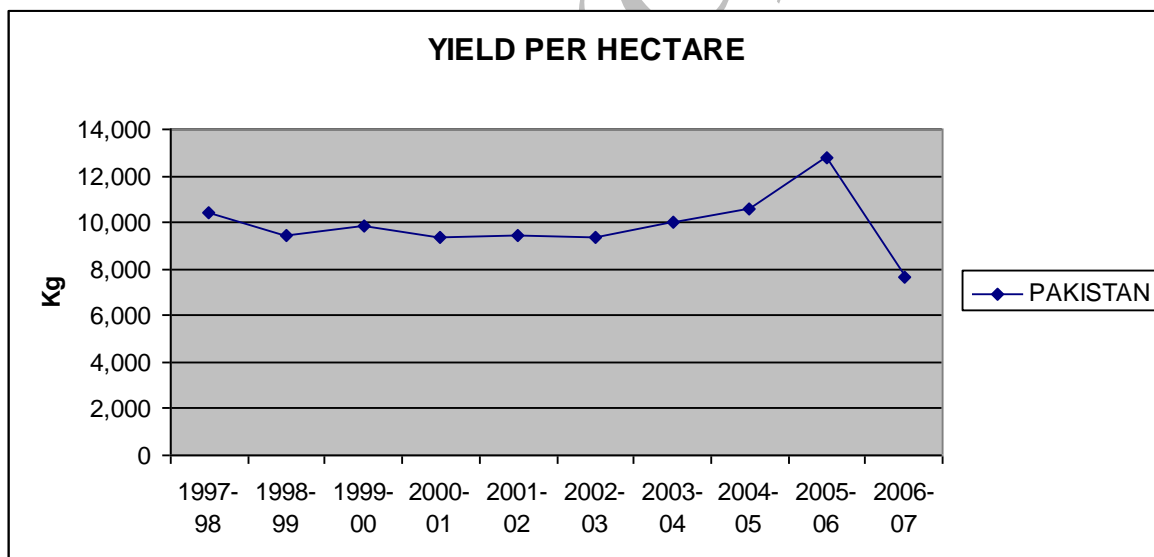
CITRUS - YEAR-WISE PRODUCTION

PRODUCTION IN "000" TONNES

YEAR	PUNJAB	SINDH	NWFP	BALUCHISTAN	PAKISTAN
1997-98	1,946.50	35.10	38.30	17.10	2,037.00
1998-99	1,769.20	35.20	39.40	17.70	1,861.50
1999-00	1,859.20	32.70	39.70	11.60	1,943.20
2000-01	1,780.80	30.90	40.20	13.60	1,865.50
2001-02	1,751.00	28.10	37.50	13.70	1,830.30
2002-03	1,623.60	27.70	38.00	13.10	1,702.40
2003-04	1,688.70	28.60	37.20	5.90	1,760.40
2004-05	1,872.20	28.60	36.80	6.00	1,943.60
2005-06	2,385.10	29.50	37.60	6.10	2,458.30
2006-07	1,400.70	31.50	34.40	5.80	1,472.40



In Pakistan yield per acre of citrus is very low as compare to developed citrus growing countries of the world. According to Agricultural statistics of Pakistan during the year 2006-07 average yield per hectare was 7,921 kg which is lowest during the last ten years. Except this year it remain almost constant @ 9 thousand kg plus.



Source: Agricultural statistics of Pakistan

Above graph shows that during the last two decades yield per acre of Kinnow orchard does not show any significant improvement.

Pakistan is located at the same latitude as Florida and its acreage under citrus (Tangerine & Mandarin etc.) farming compares very favorably with that of Florida's bearing 382,900

acres. But Pakistan lag far behind Florida's in yield per acre. . This lack of improvement can be attributed to a number of poor harvesting practices, being used by growers.

Harvesting:

Pakistan is blessed with a climate ideally suited to the farming of all kinds of fruits - rich in taste and juicy. Farmers have been developing new varieties of fruit by grafting one exotic variety with other. Sunny winters in Pakistan yield a large variety of citrus fruits. Season of Kinnow in Pakistan starts from December and last till April. It has a soft skin which is easy to peel and has a lovely fragrance. Kinnow is very delicious in taste and if treated with proper fungicide and wax and careful handing and storage of Kinnow at about 4 Degree Centigrade can retain it's freshness until 2 months.

Following are the main commercial varieties cultivated in the country:

Sweet Orange:	Succri,. Mausami, Washington Navel, Jaffa, Red Blood, Ruby and Valencia Late.
Mandarines:	Feutrells Early and Kinnow
Grape Fruit:	Mash Seedless, Duncan, Foster and Shamber
Lemon:	Eureka, Lisbon Lemon and rough Lemon
Lime:	Kaghzi Lime and Sweet Lime

Post Harvest Issues

According to the report of Pakistan National Commission on Agriculture, defects and inadequate facilities in postharvest handling transport storage and marketing cause up to 20-40 percent loss of fruit and vegetables. This is true for Kinnow as well and the value of this loss amounts to millions of rupees annually. Following are the prominent causes of Pre & Post-Harvest loss of Kinow in Pakistan.

- a) Poor Farm Management
- b) Improper harvesting
- c) Absence of anti-fungal treatment
- d) Delays in the lifting of harvested crop
- e) Poor non-refrigerated transportation
- f) Below standard Fruit markets (Sabzi-mandies)
- g) Absence of proper cold storage facility
- h) Inadequate Packing

Constraints of production:

Following factors are identified as major constraints of production.

- Absence of training institutions.

- Absence of disease treatment.
- Poor farm management practices (improper planting, pruning, fertilization, irrigation, spraying etc.)
- Absence of proper roads and refrigerated transportation
- Lack of cold storage and transportation facilities,
- Poor hygienic conditions of fruit markets.
- Lack of investment & research.
- Weak linkages among growers, processors & exporters.

Area under cultivation of Kinnow and production per annum both have increased side by side however, there is no noticeable increase in yield per acre Percentage share of exportable quality in total picked fruit also remained low. At the same time post-harvest losses are very high. Major factors responsible for this state are inappropriate planning strategies during planting, poor sanitation, poor farm management and lack of proper infrastructure for post harvest handling. In addition to the lack of technical know-how at growers' level specialized extension supports on Kinnow cultivation are virtually not available. Research output is still in its infancy and the little work done by agricultural development institutions like, Agriculture University (Faisalabad), Agriculture Research Institution (Tando-Jam) so far, is extremely inadequate. Surveys have shown that our scientists have made no noticeable improvements in the genetic engineering and in so many years have not been able to produce better varieties or have not managed any organized plan to train growers in the field of better farm management. Above all there is a lack of any coordination and sharing among different departments and organizations working with the same objectives of horticulture development. In addition there is a strong need to provide basic infrastructure like refrigerated transport, cold storage, processing, commercial scientific packing, and international marketing.

Product Specification:

Citrus is most commonly thought of as a good source of vitamin C. However, like most other whole foods, citrus fruits also contain an impressive list of other essential nutrients, including both glycaemic and non-glycaemic carbohydrate (sugars and fibre), potassium, folate, calcium, thiamin, niacin, vitamin B₆, phosphorus, magnesium, copper, riboflavin, pantothenic acid and a variety of phytochemicals. In addition, citrus contains no fat or sodium and, being a plant food, no cholesterol. The average energy value of fresh citrus is also low (see Table), which can be very important for consumers concerned about putting on excess body weight. For example a medium orange contains 60 to 80 kcal, a grapefruit 90 kcal and a tablespoon (15 ml) of lemon juice only 4 kcal.

Besides their consumption as fresh fruit, a large number of products and byproducts are made. Citrus peel is used as a Flavoring agent, Medicinal Properties, Insect repellent, Antiseptic and Aromatic compounds. Citrus peel is rich in pectin, Cellulose, Hemicellulosic polysaccharides, which can be hydrolyzed into sugars and fermented into alcohol or Fuel Ethanol.

Nutritional facts about citrus fruit

	Orange	Grapefruit	Mandarin
Weight (g)	131	236	84
Energy (kcal)	62	78	37
Fibre content (g)	3.1	2.5	1.7
Ascorbic acid (mg)	70	79	26
Folate (mcg)	40	24	17
Potassium (mg)	237	350	132

Proximate Analysis of Kinnow

Varieties	TSS	T. Acidity	PH	Sugar	Ascorbic Acid	Season
Kinnow	11-14	1.01-0.87	4.50-4.80	11-14	59-60	Nov-Feb

NUTRITIVE VALUE OF KINNOW

Chemical composition of Kinnow when ripe and ready for consumption.

• Juice %	47.50
• Vit.C.(mg/100ml)	32.00
• Calcium (mg/100ml)	40.00
• Phosphorous (mg/100ml)	18.00
• Iron (mg/100ml)	00.45
• Reducing sugar percent	03.75
• Non reducing sugar percent	03.65
• TSS %	12.00
• Sugar %	09.00
• Acidity %	01.00
• TSS/Acid ratio	10.00

Kinnow Distribution & Marketing Channel: Current Status

Harvested Kinnow is currently being marketed and consumed through the following three different Channels:

(a) Wholesale (Sabzi-mandi) markets.

Wholesales markets of fruits and vegetables are commonly known as 'Sabzi-mandies', and these markets exist in almost every major city. Seasonal crops are brought mostly by

middleman (Theka-i-Dar), and in some cases by grower himself in trucks or trolleys to the place of auction, 'Aarat', specified in these markets. Here the commodity is auctioned and the price is mostly based on the principle of supply and demand. 'Arti' (Person who do auction) and 'pandi' (Loader) takes their percentage share from the total auctioned price.

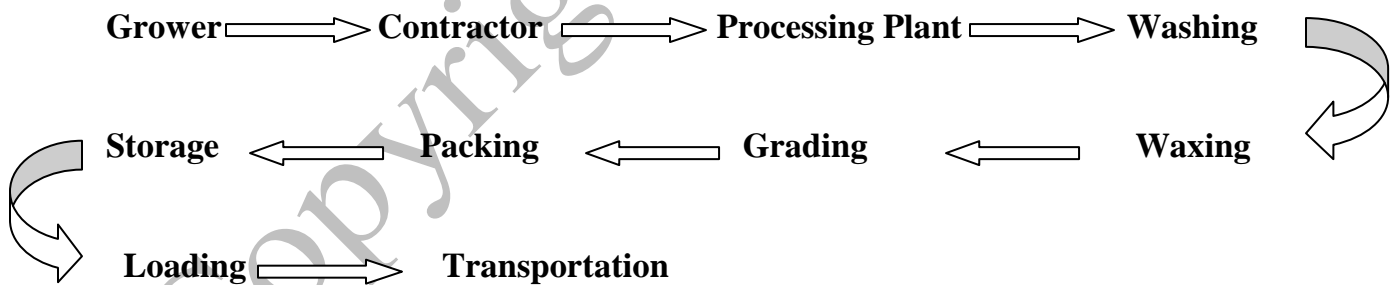
(b) Juice manufacturing factories.

Juice processing plants consume approximately 10% per season of the total available crop of Kinnow. These processing factories produce a Kinnow extract that is known as FCKJ (frozen concentrated Kinnow juice). Kinnow because of its unique taste and aroma when mixed with orange juice gives it flavor and better taste. Some times it is consumed by mixing it with alcohol, especially in European countries. It shows that this sub-sector has great potential for future exports if it is properly channeled.

(c) Export of fresh Kinnow through processing units.

Waxing and Processing of Kinnow is done to maintain its freshness and to enhance its shelf life. According to an estimate shelf life is enhanced to 90 days provided 5-10 degree centigrade is maintained. At present fresh Kinnow is being processed at both local and imported processing units. These are concentrated mostly in Sargodha (Bhalwal). Kinnow exporters generally maintain these processing units themselves and process fruit for their targeted export. Few processors offer services for others.

Flow chart is as follows:

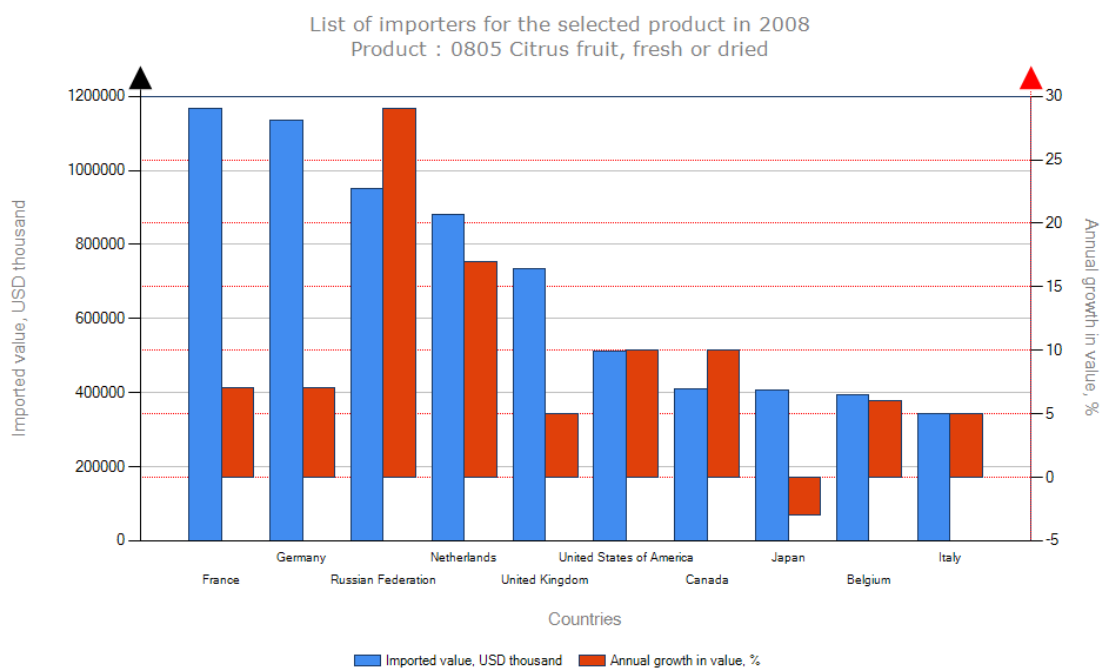


Global Trade:

There are about 187 varieties of citrus fruits available in Pakistan, but only few varieties are grown commonly. The major families of Citrus included Mandarin, Oranges, Grapefruits, Lime & Lemons. Pakistan's Kinnow belongs to Mandarin family. There are different sources of statistical data of different varieties of citrus. Marketing analysis tools of ITC have been used to examine the global trade trends as well as direction of trade of Pakistani Citrus. Citrus fruit up to HS four digits (HS 0805 Citrus Fruit fresh & dried) and six digits (HS 080520 - Mandarins) have been taken for analysis purpose.

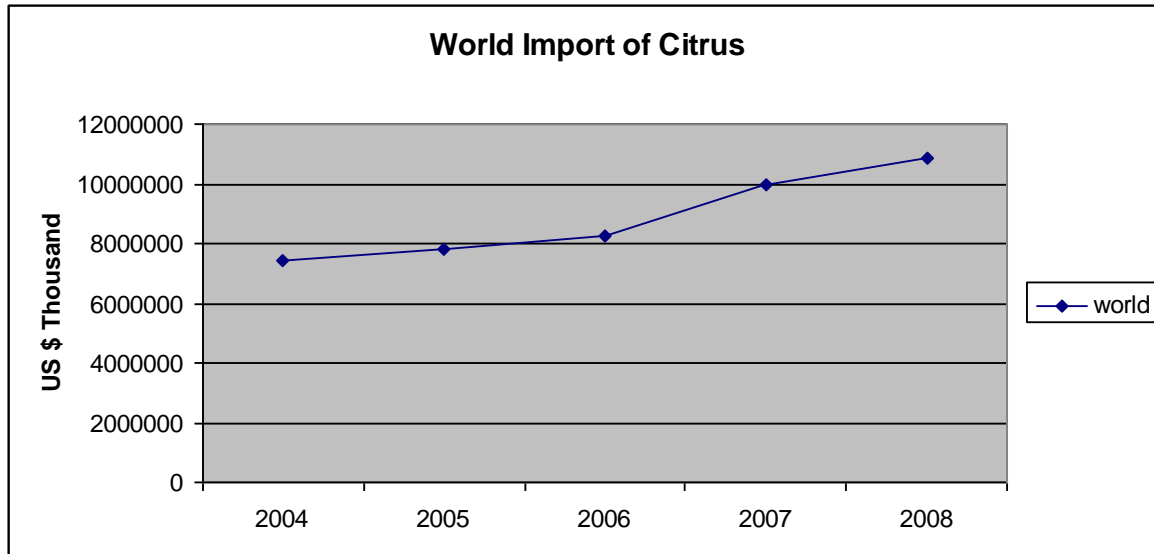
Global trade of Citrus was US\$ 10.8 billion during 2008. Mandarin is the major contributor with US\$ 3.4 billion in this trade. The world market for citrus is expanding. The exporting countries are striving to further expand their market share as new markets open up with world trade liberalization.

The following graph shows the global import trend for citrus.



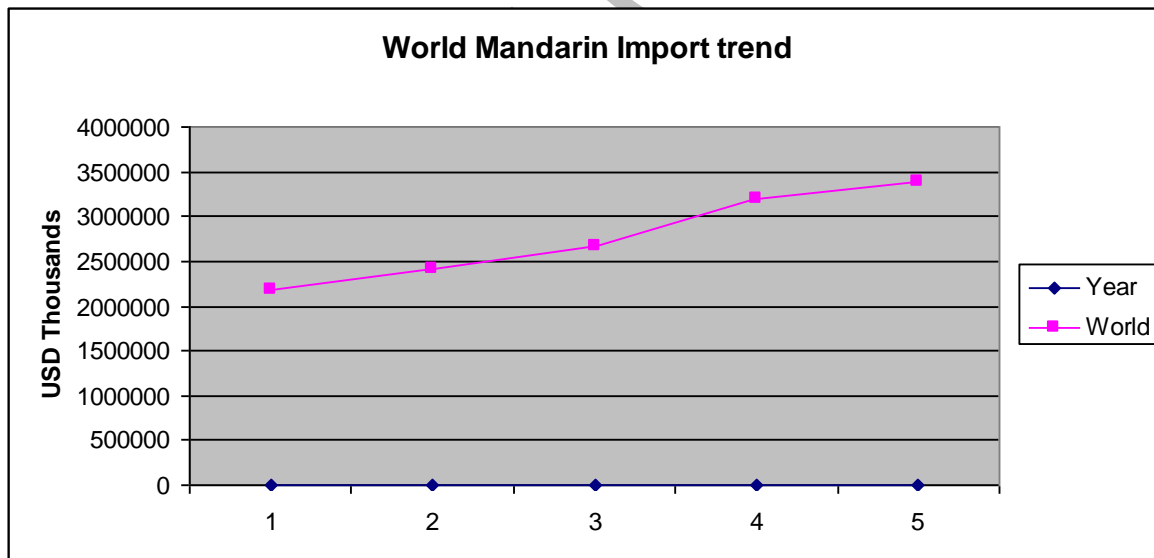
Source: ITC (Trade Map)

France is the largest importer of citrus followed by Germany and Russian Federation. List of top 25 importers may be seen at Annex - A

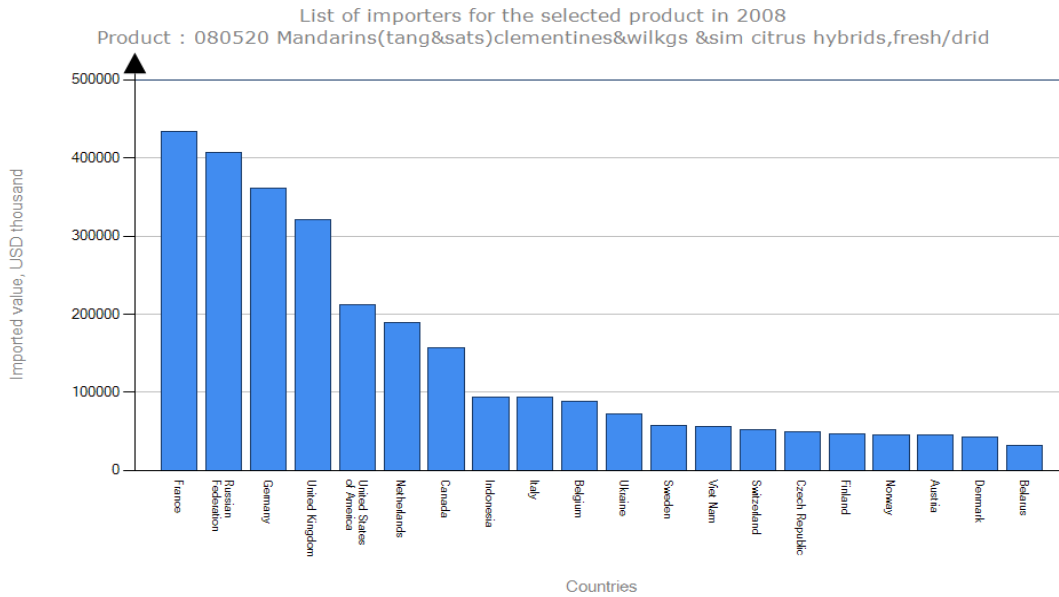


It is evident from the above graph that Global import for citrus is continuously expanding especially during the last two years there was a significant increase.

The Graphs and Tables below represent world Mandarin exports and imports trend.



It may be noticed that the world Mandarin imports has shown a continuous increase during the last five years. There was about 35% increase in the world import market of Mandarin from the year 2004 to 2008.

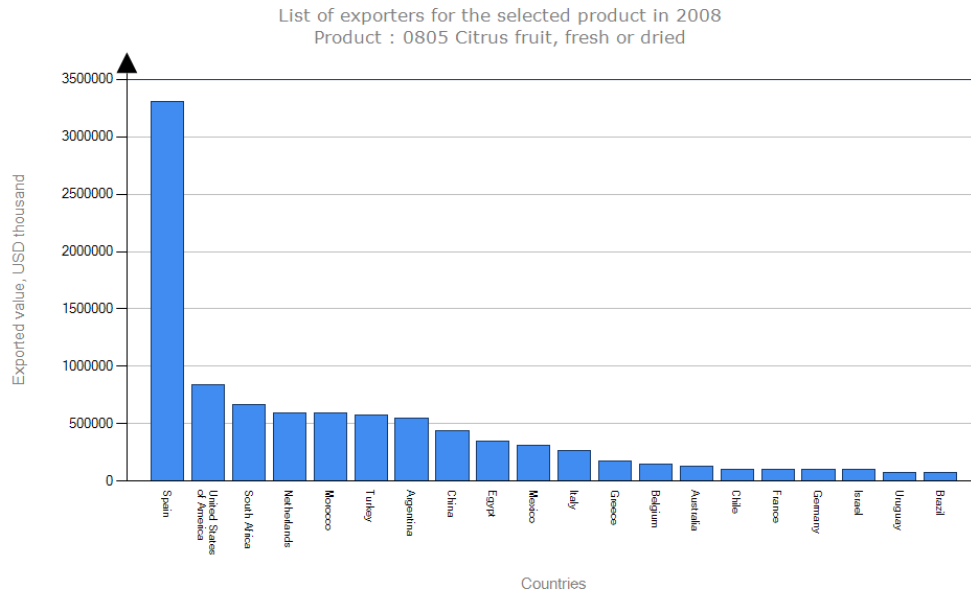


As evident from the above graph, again the largest importer of Mandarin is France followed by Russian Federation, Germany and United Kingdom. These four countries are dominating the world Mandarin import market and offer a good opportunity for Kinnow. List of top 25 importers of Mandarin may be seen at Annex – B.

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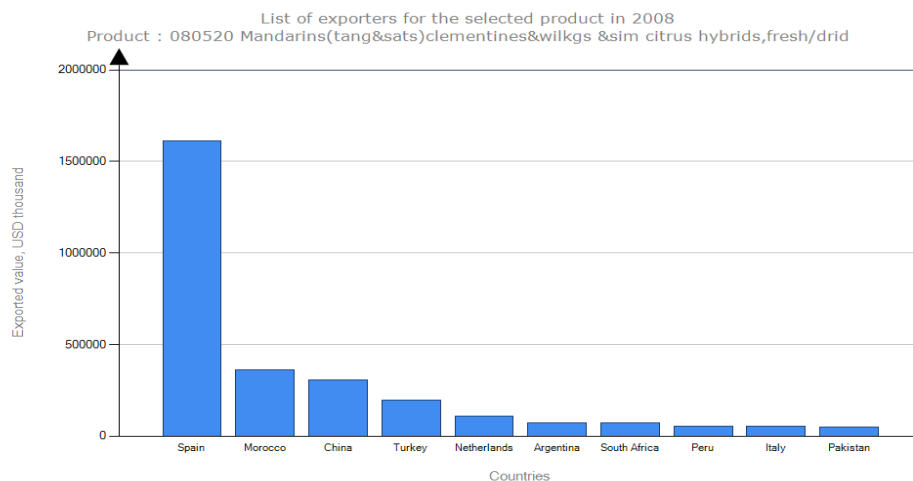
World Citrus Exports

Total world export of citrus was US\$ 10.3 Billion during 2008 with 13.2 million tons quantity. Unit value was US\$774 in 2008. Annual growth in value from 2004 to 2008 was recorded 11% whereas in quantity it was only 3%



Spain has dominated the market with exports of US\$ 3.3 billion in 2008. Unit value of Spain was also at the highest US\$ 1,115. Major destinations of Spanish Citrus are EU countries. France and Germany are leading among them. List of top 25 exporters of Citrus is attached at Annex C. Pakistan stands at 22 positions despite 10th largest producer of citrus.

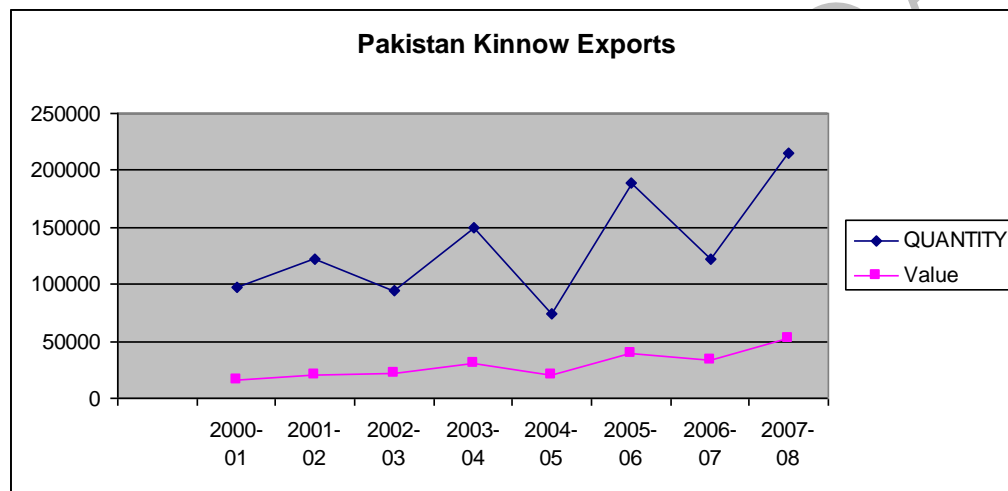
World Mandarin Exports



World Mandarin exports are also dominated by Spain with US\$ 1.8 billion out of US\$ 3.3 billion market. Morocco, China and Turkey are other main players in this sector. Pakistan stands at 10th

Export of Pakistan

Pakistan exports of Kinnow were US\$ 52.9 million 2007-08. Unit value of was US\$ 237 as compare to US\$ 1,115 of Spain. Major destinations of Pakistani Kinnow are Iran, Russian Federation, UAE, Ukraine and Saudi Arabia. List of top 25 importing countries of Kinnow from Pakistan is attached at Annex D.

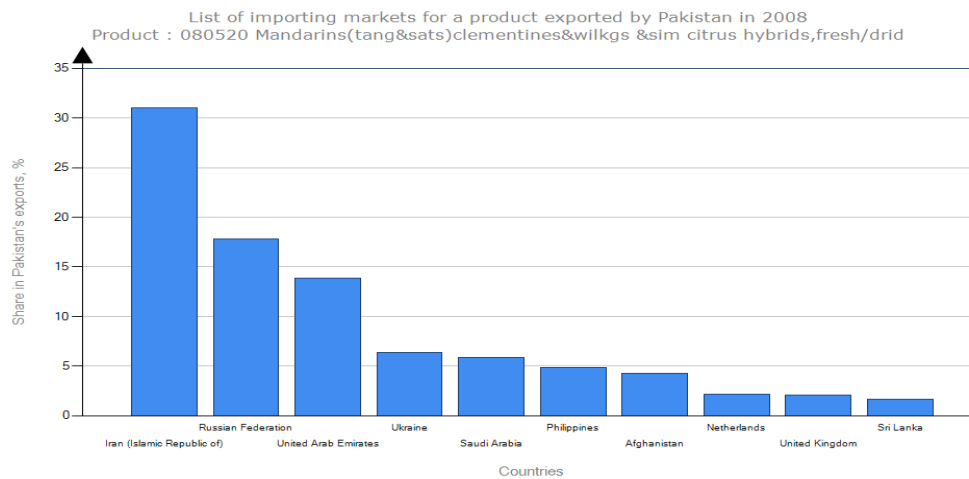


Source: TDAP

Interestingly Pakistan stands out with 69 percent growth in value during the same year 2001-08. This is the highest growth rates achieved by any single country during the above period. Every alternate year Pakistan has bumper crop as indicated in above graph.

KINNOW EXPORT FROM PAKISTAN

S.#	PERIOD	QUANTITY Kg '000'	AMOUNT IN US\$ '000'
1	2007-08	214,765	52,916
2	2006-07	122,760	32,727
3	2005-06	189,285	38,965
4	2004-05	74,508	20,683
5	2003-04	149,587	30,763
6	2002-03	94,806	21,704
7	2001-02	121,692	20,842
8	2000-01	97,028	16,310



It can be noticed from the above that Iran is the largest Buyer of Pakistani Kinnow with 31% of its total exports. Besides Spain, Turkey, China and South Africa are the major competitors of Pakistan.

Potential Markets

Pakistan traditional markets including Iran, Russian Federation and Middle Eastern countries require intensified marketing efforts to increase its existing share. However, non traditional market should be the focus of policy makers as they offer great opportunities for Kinnow. In this regard special marketing tools should be introduced to enter EU market especially east European countries. Malaysia and Indonesia also offer good opportunities if tariffs could be negotiated.

World Mandarin imports over the years have shown steady growth in terms of volume but will continue to face stiff competition in major importing markets. Many exporting countries have announced ambitious export goals and have oriented their export programs to attract larger numbers of small- and medium-size firms to exporting. The chief export policy tools employed by exporting countries are: direct export subsidies, export market promotion (development) programs, export credit and credit guarantee programs, and statutory marketing boards.

Suggestions

Pakistan fruit exporter must be appreciated though, for putting in personal efforts in order to compete in the international markets and to export Pakistan Kinnow in the absence of having received proper institutional support.

Pakistan is at present exporting Kinnow to regional and European countries. This fruit from Pakistan, by and large, catered for the culinary tastes of expatriates from the sub continent settled overseas. However, it is evident that little efforts were made to introduce Kinnow, on the part of exporters, government and private institutions, to the other segments of the markets apart from expatriates. One example can be found that, with the exception of one or two instances, Pakistan Kinnow has hardly made its way to any major retail chain stores or super stores in Europe and even in Far East.

Interventions are required for promotion of Kinnow exports at supply side by providing infrastructural support and at marketing side by starting concerted marketing campaign.

An awareness campaign should be initiated focusing the growers to educate them about the export potential, waste management and international market requirement. To hold the first seminar in this regards, a proposal is annexed at E. TDAP should assist the sector by establishing Citrus Development Center (CDC) in Bhalwal. Detailed proposal is attached at Annex F.

Different delegations should be organized to explore the potential markets. It is also proposed that growers should be given representation in each delegations. A proposed calendar of delegation is attached at Annex G. Moreover, TDAP should participate in international exhibitions especially in East European countries. List of some exhibitions are attached Annex H for consideration.

List of top 25 Importers in 2008

Importers	Value in USD thousand			
	Value imported	Quantity imported (Tons)	Unit value (USD/unit)	Share in world imports, %
'World	10,858,600	12,415,920	875	100
'France	1,166,953	965336	1209	10.75
'Germany	1.135,897	1079336	1052	10.46
'Russian Federation	951020	1288437	738	8.76
'Netherlands	879994	920755	956	8.1
'United Kingdom	733176	709025	1034	6.75
'United States of America	512917	539753	950	4.72
'Canada	408432	437868	933	3.76
'Japan	405845	351473	1155	3.74
'Belgium	394001	322888	1220	3.63
'Italy	342006	306468	1116	3.15
'Hong Kong (SARC)	192383	225556	853	1.77
'Ukraine	189995	344395	552	1.75
'Spain	189003	248516	761	1.74
'Saudi Arabia	177226	316854	559	1.63
'United Arab Emirates	173008	282938	611	1.59
'Sweden	170784	166043	1029	1.57
'Switzerland	167397	125214	1337	1.54
'Czech Republic	144323	151989	950	1.33
'Austria	138865	115589	1201	1.28
'Denmark	118917	122754	969	1.1
'Indonesia	117021	138711	844	1.08
'Norway	114303	74265	1539	1.05
'Republic of Korea	105520	184189	573	0.97
'Poland	105381	113319	930	0.97
'Romania	94617	148600	637	0.87

Source: ITC