

2019

Cluster Profile

Citrus Processing, Sargodha



Turn Potential Into Profit

Small and Medium Enterprises Development Authority (SMEDA)
Ministry of Industries and Production (MoI&P)
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1 Description of Cluster

1.1 Introduction

Pakistan is blessed with vast agricultural resources on account of its fertile land, well-irrigated plains, extremes of weather, and centuries old tradition of farming. 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. Citrus and mango are the major fruits and account for 33 and 23 percent of the total Pakistan fruits production of around 7.05 million tons, in 2017-18, respectively¹.

Pakistan is a major producer of Citrus (worldwide ranking: number 14 in 2018), but a relatively small exporter. Citrus includes oranges, mandarins (Kinow), grapefruits and lemons, however, only Kinow accounts for 65 percent of the total Pakistan citrus production with 2.27 million tons², in the year 2018. Annually 10 to 12 % of total Pakistan “kinnow” production is officially exported, at relatively low prices per kg as compared with other exporting countries. Citrus is grown in all four provinces of Pakistan but 95 percent of total Citrus plantations are in Punjab and that contribute towards 96 percent of total crop production. Sargodha is the main citrus producing district followed by Toba Tek Singh and Sahiwal. Current share of Sargodha in national citrus production is around 44% (1.00 million tons). National average growth in citrus production for 2008-18 is 2.16% and for Sargodha for the corresponding period it is 2.12%.

Citrus Processing Industry in Pakistan has been growing steadily in the last decade. The Citrus Processing Units are predominantly located in Bhalwal District Sargodha. Presently, Sargodha citrus processing cluster is comprising of around 160³ processing units. Majority of the units are operating as small and medium scale processors, with exception of few large processors. Citrus is among the main exportable horticulture commodities from Sargodha and accounts for around 90% of the total citrus exports from Pakistan. The cluster is providing direct employment opportunities to around 25,000 ~ 30,000 people.

1.2 Defining the Products

Different varieties, like Mandarin, ‘Oranges, Grapefruit, Lemons and Limes are produced in Sargodha. Approximately about 65 per cent of total citrus production is comprised of mandarin being popularly known as 'Kinnow'. Quality wise, 'Kinnow' is the most important variety. It is relished both domestically and internationally for its flavor. It is golden in color and has a thin loose skin. This variety has been obtained through the cross-breeding of two other varieties 'King' and 'Will Leaf'.

¹ Ministry of National Food Security and Research, Government of Pakistan

² FAO

³ Source: Sargodha Chamber of Commerce & Industry (SgCCI) and Citrus Research Institute, Sargodha



Table 1: Major Product Classification of Citrus

Mandarin	<ul style="list-style-type: none"> • Kinnow • Feutrell
Sweet Oranges	<ul style="list-style-type: none"> • Red Blood • Musami • Valanci Late
Grapefruit	<ul style="list-style-type: none"> • Mash Seedless • Duncan Foster • Shamber
Lemons	<ul style="list-style-type: none"> • Eureka • Lisbon Lemon • Rough Lemon
Limes	<ul style="list-style-type: none"> • Kaghzi Lime • Sweet Lime

Salient Characteristics of Pakistani ‘Kinnow’ Variety

- Easy Peeler.
- High Juice Content.
- Rich source of Vitamin ‘C’.
- Delicious & Refreshing Taste.
- Highly Flavored & Aromatic.
- Attractive Color.
- Table Serving Fruit.
- High Nutritional Compositions which are equally benefited for all age groups.

1.3 Core Cluster Actors

The processors of citrus fruit are core cluster actors. The statistics of core cluster actors are as follows:

Table 2: Citrus Processing Cluster, Sargodha

Number of Units	<p>Approximately 160 Units (Registered members of Sargodha Chamber of Commerce & Industry)</p> <ul style="list-style-type: none"> • Around 15 Units Large and Organized – Processors and Direct Exporters • Approximately 65 Units Medium – Processors and Indirect Exporters • Moreover, around 80 Small Processing Units
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Employment Generation	About 25,000 ~ 30,000 people are directly and indirectly employed by the citrus processing cluster, Sargodha. A lot of labor is also engaged on daily wages or contractual employment on seasonal basis.
Total Production	Around 300,000 Tons Processed Kinnow
Capacity Utilization	80% of Installed Capacity

Source: Sargodha Chamber of Commerce & Industry (SgCCI), Sargodha Dry Port and Citrus Processing Industry, Sargodha

More than 90% of total export of citrus from Pakistan is being catered by the Sargodha Citrus Processing Cluster. In 2017-18, Pakistan's exports of citrus was 236,800 tons⁴.

At present installed capacity and production of these citrus processing units can be assumed sufficient to fulfill the demand. However, sufficient gap exists due to increasing trend of export. Moreover, the processing of juices, pulps and dry powder have a tremendous potential for export and can earn a reasonable foreign exchange.

1.4 Other Cluster Actors

Processors normally sub-contract/out-source the products like Wooden/Corrugated Box, Sheets, Used Newspaper, Plastic Bin, Fresh fruit, Cold Storage Services, logistics from support firms to reduce cost. Support firms engage in price based competition to get subcontracting orders. There is a continuous growth of support firms in the cluster. Support firms have developed a niche in product/service.

1.5 Geographical Location

Bhalwal District Sargodha area is most popular for taste and size of Kinnow, Malta, Musammi, Grapefruit, and Redblood as the climate is suitable for these fruits. The processing Industry in Sargodha is largely located in Bhalwal.

1.6 Current Cluster Scenario

Citrus Processing Industry of Sargodha has a huge potential to grow. Though the demand of Pakistani fruits is enormous but our exporting potential is a mere 10 percent due to a big chunk of 30 per cent going to waste on account of poor management during harvesting, transportation, packaging, and storage. The harvesting season lasts for 4 months, starting from mid of December to mid of April. There is a need to follow the well-established production technology, improve post harvesting, packaging, transportation, and storage facilities. There is an urgent need to move the industry towards step by step automation to compete with rapidly changing environment of world in technology and regulatory framework. Simultaneously, there is also need of the hour to

⁴ Ministry of National Food Security and Research



comply with the international environmental, management, safety and sanitary standards. The growers suffer from poor quality and low producing seedlings purchased from the unspecified nurseries using inferior and infected bud wood.

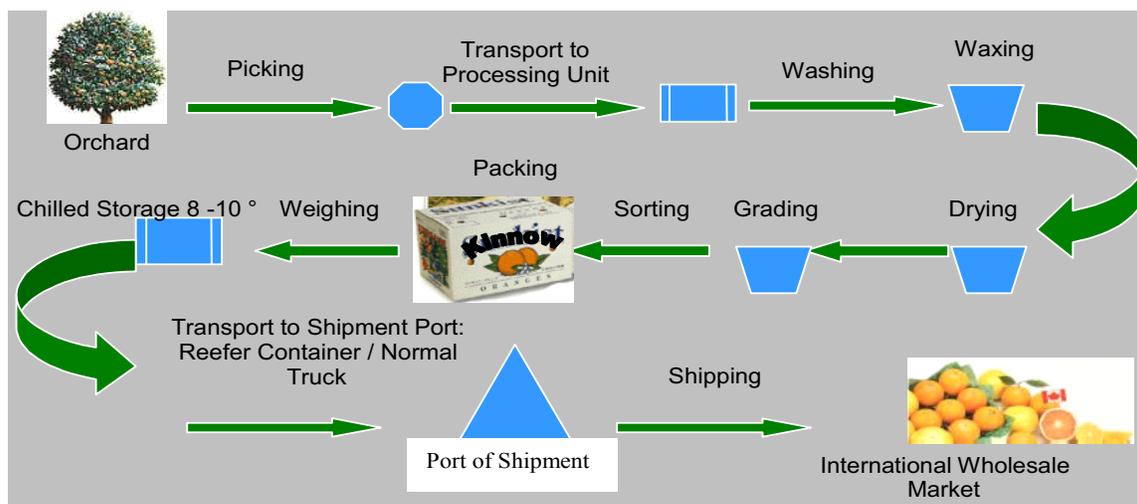
2 Analysis of Business Operations

2.1 Production Operations

The major operational activities of the project include following processes:

- Sorting
- Washing
- Waxing
- Drying
- Grading
- Packaging

Figure 1: Process Flow Diagram



Citrus Processing starts with the washing of Citrus in a Bin. Through conveyer, the Citrus is transferred to wax area where the fruit is coated with the wax. After washing, Citrus is dried by the hot air dryer and moved to sorting area. After sorting, Citrus is graded in different sizes. Now the product is ready for final packaging and moved either to cold storage or directly load into refer containers. It is important to mention here that at each stage of washing, waxing, drying, sorting, grading and packaging, a small miscalculation at all these stages may lead to spoil the rest of the shipment.

Kinnow count, size and standard packaging

The fruit is generally divided into two main qualities, A and B. where, A quality citrus is exported and B quality is traded in local markets. The size of A and B quality citrus fruit varies from 56 mm to 100 mm. The size of kinnow carton varies from 7 kg to 13 kg depending upon buyer and market requirements. The number of citrus fruit in a carton varies from 24 to 120 depending upon carton and citrus fruit size.



Table 3: No. of Citrus Fruits in One Carton

Carton Weights	No. of Citrus Fruits in One Carton*
7 Kg	24 to 54
10 Kg	42 to 100
13 Kg	60 to 120

* Depending on the size of the Citrus Fruit

2.2 Raw Materials

Fresh citrus fruit is the basic and major raw material, in addition to the following material that is used in the processing of the fruit;

- Fresh Fruit (Citrus)
- Wooden Box
- Wax
- Diesel

The stated raw material is easily available in the local markets.

2.3 Technology Status

The Citrus Processing Plant is often made by the local manufacturers. Although the plant is not full of international environmental, management, safety and sanitary standards, yet it can fulfil the demand of the processors and exporters after certain changes.

2.4 Quality Assurance (Quality Standards and Certificates)

Citrus Processing Industry is currently supported by various Government institutions like Pakistan Horticulture Development Export Company, Ministry of National Food Security and Research, Trade Development Authority of Pakistan etc. In the areas of International Certification (Global GAP), Marketing, and Seedless variety, it is worth mentioning that world's best fruit growing

countries have self- sustaining certification program backed by the government agencies and research institutes which provide longer production life to orchards with yields three times more than ours.

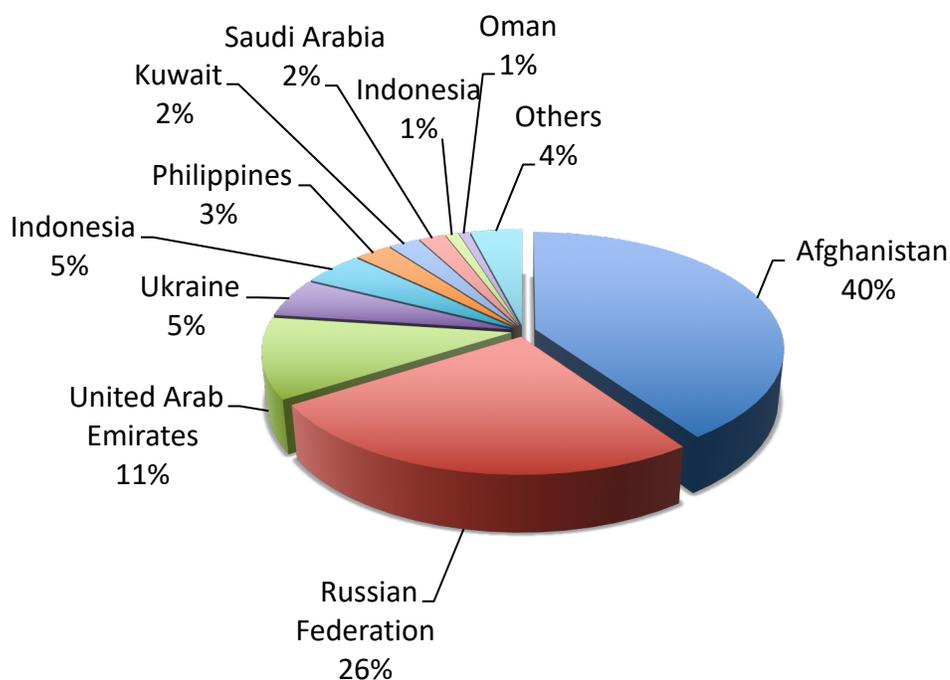
To promote and support this industry, Ministry of Science and Technology (MoS&T) is playing a pivotal role. MoS&T is offering free of cost training programs on ISO 2200 and Global Gap through out Pakistan in order to standardize and comply the Citrus and related products with International Standards.

2.5 Marketing & Sales

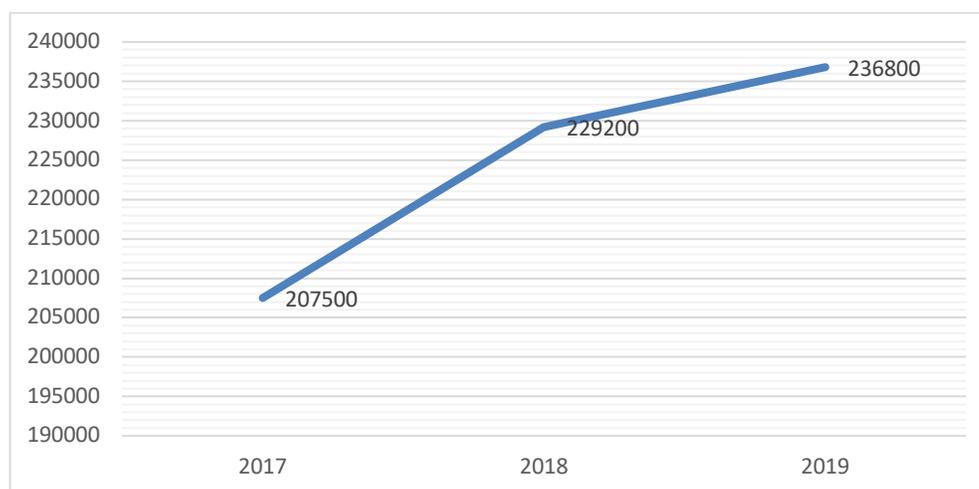
Sargodha Citrus Processing Cluster is primarily targeting the international and export market; around 90% of the total citrus exports from Pakistan are being supplied from the cluster. Important export markets for Pakistan kinnow are Afghanistan, Iran, Indonesia, Malaysia, Eastern European and Russian Federation countries.

In order to target and cater for the market, processors have developed a network of traders and exporters in the cluster. However, large and medium size units are also directly exporting to different countries.

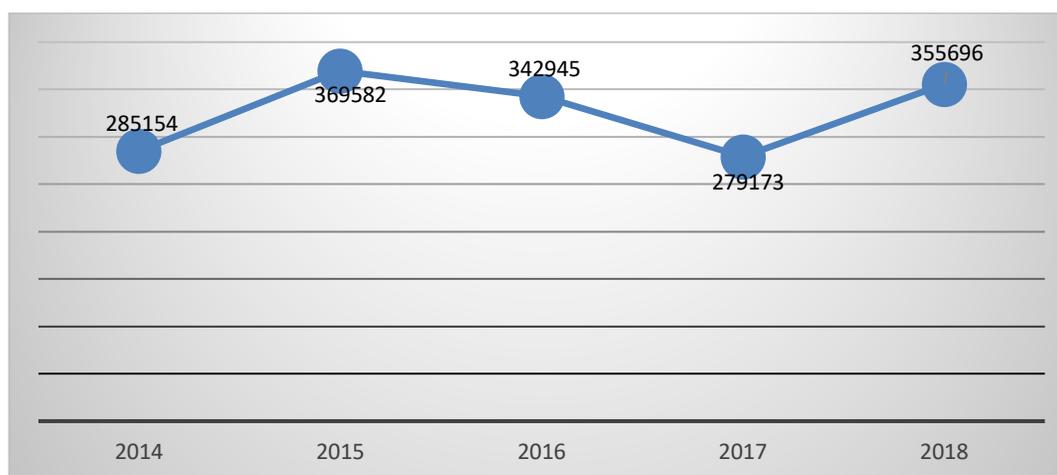
Figure 2: Pakistan Citrus Exports (2017)



Source: Trade Map

Figure 3: Citrus Exports Pakistan (Tones)

Source: Trade Map

Figure 4: Pakistan Citrus Exports (US \$ Thousand)

Source: Trade Map

2.6 Financing

At present, financial institutions have not developed / offered any specific lending scheme for the development of Citrus Processing industry. The financial products available in the market do not cater the requirements of this sector. The financial institutions lack awareness on ways to market and sell their services to SMEs. Citrus growers and exporters low level of education is also an obstacle to avail the financial products. However, the cluster members may get benefit of the existing generic financial products and services of the financial institutions.

2.7 Human Resource

The education level of workers / labor working in this cluster is very low which is a major hindrance in learning and accepting new tools and techniques for picking, waxing, grading and packing. The labor is unskilled and major factor in the loss of quality product, because these workers are involved in mechanical injuries. The industry is forced to work on conventional lines. There are no specific vocational training facilities for the training of workers of this cluster. Therefore, Government may coordinate with the growers and processors to design TEVTA based programs before the start of the Citrus season to impart necessary skills to the labor.

2.8 SWOT Analysis

Strengths

- Pakistan's Citrus production is dominated by Mandarin (Kinnow and Feutrell). This fact is important in assessing the long term competitive advantage of Pakistan in market for Citrus products on one hand and the export potential of Pakistan's Kinnow on the other hand.
- The storage life of fruits can be extended by 50-100 per cent by using wax technology and of kinnow up to 30 days.
- Superior suitability for processing.
- Nutritional benefits.
- Low cost.

Weaknesses

- The expanding exports are facing some inherent problems like yield fluctuations, commonly known as alternate bearing phenomenon (low yield in alternate year) factor.
- The citrus industry as a whole is still underdeveloped with lack of competitiveness.
- Poor management during harvesting, transportation, packaging, and storage.
- Pakistani citrus has a great demand in international market but higher number of seeds is one of the biggest constraint.
- Kinnow has the longest growing period and is a late maturing variety with short crushing and processing period.
- The growers suffer from poor quality and low producing seedlings purchased from the unspecified nurseries.
- Inadequate research facilities under international accredited labs may hamper the quality of citrus fruit.

Opportunities

- Rapid propagation technologies for seedless Citrus may lead to increase in exports.



- The recovery of citrus by-products (peel oil, aroma and essence oil, frozen pulp cells and cattle feed pellets) is an important economical aspect in citrus processing operations and it is particularly appropriate when a large volume of fruit is processed.
- Signing bilateral Free Trade Agreements (FTAs) with various countries can be another contributing factor in boosting Citrus exports.
- Adequate level of Marketing and Promotion may enable the exporters to promote their products at international level.
- The growth of allied Citrus Industries is also promising.

Threats

- The Citrus Processing Industry is labor intensive and facing critical shortage of skilled workers.
- Increasing attacks of various fruit diseases also hinder the production of quality fruit.
- Load shedding and high tariff of Electricity is also a major obstacle to enhance the citrus processing.

3 Institutional Setup

3.1 Entrepreneurs' Associations

Pakistan Fruits & Vegetables Exporters, Importers and Merchant Association

Address: House No. 175, C.P. Berar Society, Block 7/8, Karachi
Tel: (+92 21) 34922290

Sargodha Chamber of Commerce and industry (SCCI)

Address: House. No. 2, Main PAF Road, Sargodha
Tel: (+92 48) 9230 834-5
Web: www.scci.pk

3.2 Support Institutions

Regional Business Center (RBC) – Small & Medium Enterprises Development Authority (SMEDA)

Address: House. No. 2, Main PAF Road, Sargodha
Tel: (+92 48) 9230 834-5
Web: www.smeda.org.pk
Email: rbcsgodha@gmail.com

Punjab Small Industries Corporation (PSIC)

Address: Mela Mandi Road, Sargodha



Web: www.psic.gop.pk

Citrus Research Institute, Sargodha

Address: Rasala No. Military Farm Road, Sargodha

Tel: (+92 48) 3701312, 3713669, 3719812

4 Major Issues and Problems

Production Methodologies & Farming Practices

- Lack of quality assured Farm Inputs - Viral Free Planting Materials, Pesticides etc.
- Lack of modern technologies and scientific farming practices and inadequate Pest Management Techniques
- Absence of certified nurseries
- Poor Farm Management – Lack of Skilled Workforce
- Low yield, Seasonal Farm Contracting – Price insecurity
- Non-compliance with Int’l Standards (EUROGAP, SPS, etc.)
- Lack of innovation- Seedless variety commercial production
- Lack of business acumen, weak linkages with processors & exporters - disproportionate power of middleman
- Lack of storage and transportation facilities
- Lack of crop insurance products in the sector

Constraints of Exporters

- Highly skewed production – seasonality & perishability
- Incapability of Exporters to deal with quality sensitive buyers
- Weak Compliance to International Standards & Certification
- Lack of quality processing and packing
- Poor image of Pakistan as a supplier of Quality Fruits
- Lack of Product diversification – Seedless Varieties
- Competition from other citrus exporting countries
- Market diversification - limited access to high end markets

Constraints of R&D and Infrastructure

- Lack of technical expertise & infrastructure



- Lack of cold storages, ripening chambers, packing houses and transportation facilities etc.
- Limited and expensive refrigerated transport facilities
- Limited air cargo space
- Ineffective and outdated research setup – Seedless Varieties
- Lack of value-added processing facilities – Citrus Concentrate, De-hydration, Canning etc.

5 Investment Opportunities in Cluster

Following are some of the potential projects.

➤ Citrus Juices and Pulp Processing

In addition to consumption of Citrus fruit in Fresh form, numerous alternatives of processing are also available. Processing of Citrus pulp and juices, carried out in the cluster is on limited scale. Citrus flavored soft drinks and citrus juices are not much popular in Pakistan as compared to other beverages. Small quantity of Citrus is also processed into Jam, Jelly, Squashes and Marmalade.

➤ Recovery of Citrus by-products

Recovery of peel oil, aroma and essence oil, frozen pulp cells and cattle feed pellets from Citrus fruit processing is also a potential opportunity.

➤ Corrugated Packaging

Corrugated Packaging can be the potential segment of the Citrus Processing Industry. The Citrus Processing Industry has enormous opportunity for establishment and growth of Corrugated Packaging to cater the increasing production of Fresh fruit.

➤ Wood Packaging

Wood packaging is the substitute of the corrugated packaging to serve the local market and can be another lucrative segment for investment.

➤ Logistics (Transport)

Offering exclusive logistic services in transportation via Full truck or Refer Containers is also promising segment for investment.

➤ Wax Manufacturing

Manufacturing of citrus wax at local level is highly potential investment area which may fetch good income/earning.