State Level Upgradation Plan-Punjab

PM-FME

February,2023

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1.1.1. Overview - Recent trends – Growth rate – Market trends

The agriculture sector of India has treaded an extended path of transformations and revolutions. The transformation of the agriculture sector has provided due leverage to the food processing industries through continuous supply of quality inputs (raw materials) to keep the wheels turning. The food processing industries have given an impetus to diversification and commercialization of agriculture sector through enhancement of shelf life, ensuring value addition to agricultural produce, generation of employment, enhancing income of farmers and creating markets for agro products. The rich diversity of Indian food basket adds novelty and value to processed products resulting in high value realization in the market, especially in export markets.

The growth of the food processing sector across the globe is propelled by the emerging population growth coupled with urbanization and rising living standards backed by dietary shift to higher value-added products. The changing consumer preferences for organic and healthier food markets with higher standards of food safety regulation and traceability has catapulted the food processing sector with more innovation in production and packaging. The main driving force now shaping the global food system is transnational food manufacturing, retailing and fast food service corporations.

Overall, less than 10 percent of the total food produced is processed into value added products in India. In comparison, the US and China processes 65 percent and 23 percent of their produce, respectively. Similarly, other developing countries such as Thailand, Philippines, and Brazil process as high as 30, 78, and 70 percent of their produce, respectively[1].

The food processing sector includes fruit and vegetables; spices; meat and poultry; milk and milk products, alcoholic beverages, fisheries, grain processing and other consumer product groups such as confectionery, chocolates, cocoa products, soya-based products, mineral water and high-protein foods.

As per the Ministry of Food Processing Industries (MoFPI), items under the food processing industries pertains to these two processes: "(a) Manufactured Processes: if any raw product of agriculture, animal husbandry or fisheries is transformed through a process [involving employees, power, machines or money] in such a way that its original physical properties undergo a change and if the transformed product is edible and has commercial value, then it comes within the domain of Food Processing Industries and (b) Other Value-Added Processes: hence, if there is significant value addition (increased shelf life, shelled and ready for consumption etc.) such produce also comes under food processing, even if it does not undergo manufacturing processes."

The processed food market is expected to grow to $ 543 bn by 2020 from $ 322 bn in 2016, at a CAGR of 14.6%[2]. According to the Ministry of Food Processing Industries (MoFPI), post-harvest losses account for US$1.5 billion (Rs 92,000 crores) annually. With less than *10 per cent* of the produce getting processed, food processing sector is in its **nascent stage in India.** Recognising the immense potential of this sector in promoting inclusive growth, it has been identified as one of the key thrust areas under the **'Make in India'** Programme.

The Gross Value Added (GVA) in percentage[3] reflects a significant variation across the various sub-sectors. The sub-sectors such as "Processing of cocoa, chocolate and sugar confectionery, soft drinks, mineral water and other bottled water and manufacture of prepared meals and dishes" have shown the high GVA percentage in the range of 33% to 155% whereas the sub sectors such as "Processing of vegetables, animal oils and fats products, grain mill, animal feeds and dairy products" contribute somewhere between 3% to 10% in the GVA. The huge variation in the GVA contribution percentage by various sub-sectors brings down the aggregate GVA level of FPI. With 100% FDI permitted under food processing sector, the sector has witnessed FDI equity inflow of USD 3.28 billion during April 2014 to March 2019. In India, the overall per capita sales of packaged and processed foods

[1] Invest India
[2] https://www.investindia.gov.in/sector/food-processing
[3] *Per input*

nearly doubled from USD 31.3 in 2012 to USD 57.7 in 2018. The food processing Industry in India is largely domestic oriented. Increasing foreign investments in this sector signifies a vast increase in the food and beverages products being offered by global multinational companies as well as domestic companies.

In India there are a number of organizations working exclusively on food related aspects and a list of major organizations is depicted in the figure below. In addition, all State nodal departments for food processing, State Agriculture Universities, private universities and private colleges also undertake R&D and offer courses / training under food processing, food science & technology and food engineering.

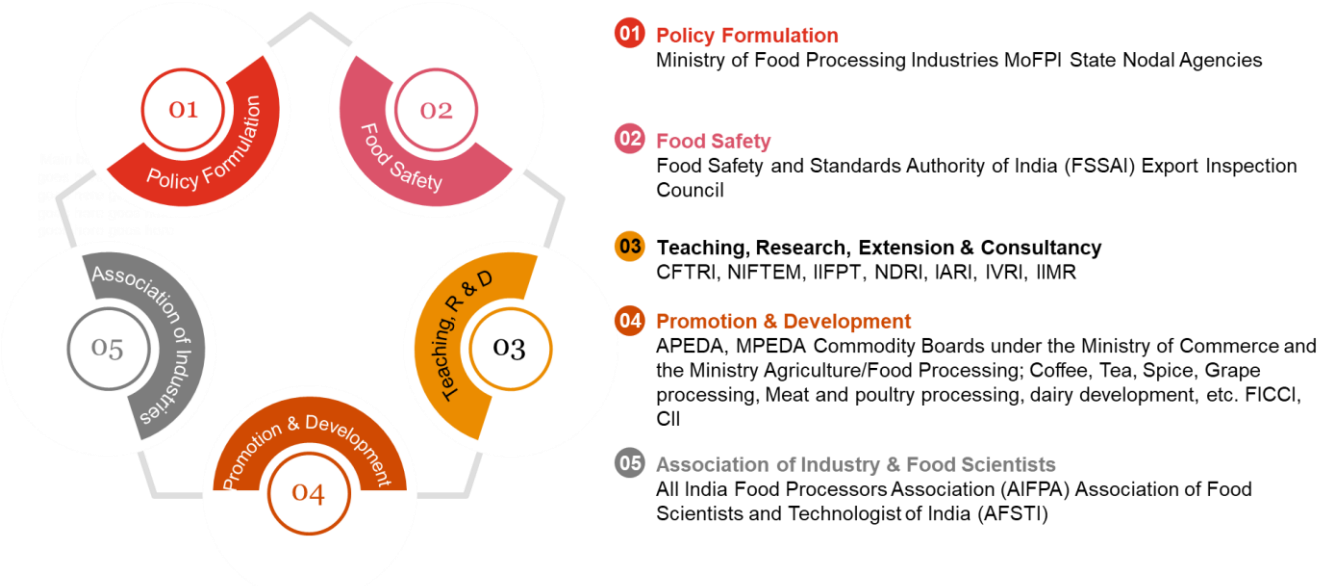
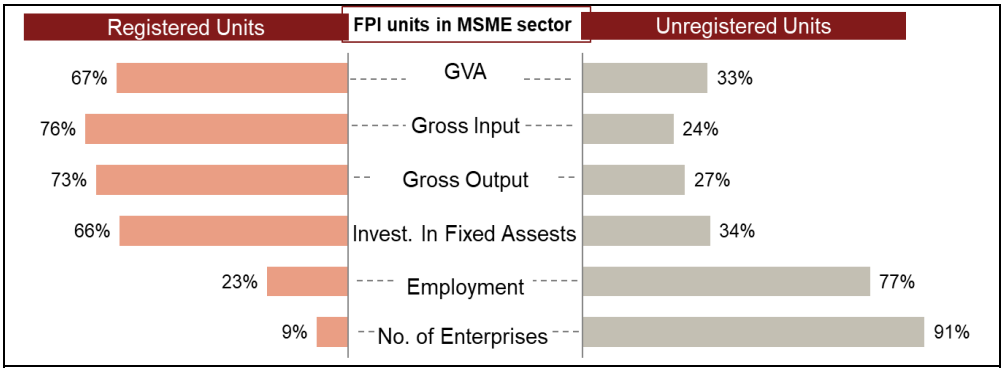


Figure 1: Agencies involved in Food Processing

1.1.2. Overview of the Micro-food processing enterprises in India

Despite the diversity of production systems and the different degrees of obstacles, the unorganized food processing industry in India is facing shared challenges that limits its development and weakens the performance of its enterprises. These challenges include: (a) lack of productivity and innovation due to limited skills and access to modern technology and machinery for production and packaging; (b) deficient quality and food safety control systems, including lack of basic awareness on good hygienic practices (GHP) and good manufacturing practices (GMP) ; (c) inadequacy of information and difficulties in promoting typical products; unorganized food processing enterprises are unable to access food growth markets because of low levels of formal relationship with large firms impacting their ability to leverage up-stream markets and also have stable and secure business contracts; and (d) limited access to credit from formal financial institutions to expand production capacities. In addition, some enterprises are faced with weak infrastructure, particularly the lack of electricity supply and the absence of a cold chain system leading to major food safety hazards impacting public health as well as economic and trade performance. The sector is also faced with a lack of an enabling environment, especially training infrastructure and services aimed at ensuring innovation, continuing human resource development and capacity building for the food.

Figure 2: Food Processing Industry units under MSME sector



Source: mofpi.nic.in

The unorganized micro food processing units are mostly concentrated in rural areas with participation of small and marginal farmers. The performance of the unorganised sector has been limited by several challenges. The Central and State Governments have been making efforts to organize farmers in Food Processing Organisations (FPOs) and Self-Help Groups (SHGs), by bringing together small farmers and agricultural entrepreneurs, which can enhance the opportunity to build more stable supply chain. The participants of this sector need intensive hand holding support for skill training, entrepreneurship development, technology upgradation, credit and marketing support across the value chain, along with the active participation of the state government for better outreach.

1.1.3. Challenges & Opportunities

Food processing industry is facing constraints like non-availability of adequate infrastructure, lack of adequate quality control & testing infrastructure, inefficient supply chain, crop seasonality, high inventory carrying cost, high taxation, high packaging cost etc.

- **Inadequate infrastructure facilities:** The inadequate support infrastructure which is the biggest bottleneck in expanding the food processing sector, in terms of both investment and exports includes long and fragmented supply chain, inadequate cold storage and warehousing facilities, road, rail and port infrastructure.
- **Food safety laws & inconsistency in state and central policies:** The Indian food regulations comprise of various food policies that have enacted at different points of time and are under the ambit of various Ministries of GoI. The result is that the food sector in India is governed by a number of different statutes rather than a single comprehensive enactment. This approach has led to incoherence and inconsistency in the food sector regulatory scenario.
- **Lack of adequately trained manpower:** Most positive developments in the food processing sector have also resulted in the apprehension about the emerging skill shortages due to mismatch between the demand for specific skills and available supply. In fact, of late, shortage of skilled, semi-skilled and unskilled workers has emerged as a critical factor impacting the competitiveness of Indian Food Industry.
- **Delay in obtaining land and other statutory approvals:** Delays in land acquisition due to requirement of conversion of land use (non-agricultural use permission). Lengthy procedures for Government clearance - The clearances from Government apartments like Municipal/ Town Planning Authorities, Pollution Control Board, State Electricity Department, Boiler Inspector, etc. usually delay project implementation.
- **Fluctuation of raw material prices** leading to viability issues in food industries. Sudden rise in the prices of raw materials have resulted in temporary or complete shutdown of food factories in the past.
- **Lack of market intelligence** and brand building of Indian Food Processing Industries.

Apart from the above major challenges hampering the growth of sector, constraints in raw material production, consumer education on nutritional facts of processed foods, low price elasticity for processed food products, need for distribution network and cold chain, backward-forward integration from farm to consumers, development of marketing channels, development of linkages between industry, government and institutions, lack of applied res

2. Punjab: The winning leap

2.1. State Profile

The state of Punjab is situated in strategically important northwestern part of India. The state is situated between the latitudes 29.30° north to 32.32° north and longitudes 73.55°east to 76.50°east. It covers an area of 50,362[4]sq. Km, which makes it 20th largest Indian state by area. The total population of Punjab is 2,77,43,338 and it is the 16th largest state by population in India. Total number of districts in the state of Punjab is 22. Punjab shares its boundary with Pakistan on the west, Jammu and Kashmir in north, Himachal Pradesh in north east and Haryana and Rajasthan in the south. On the basis of river flowing through the state, Punjab is basically divided in three regions. These three regions are Majha, Malwa and Doaba. Majha region is situated between the beas and ravi rivers. Doaba region is situated between satluj and beas river. Malwa is the largest region by area and it is situated south of river satluj.

Sr. No	Region	Districts
1	Majha	Amritsar, Taran Tarn, Gurdaspur and Pathankot
2	Doaba	Jalandhar, Kapurthala, Nawanshahr and Hoshiarpur
3	Malwa	Barnala, Bathinda, Fatehgarh Sahib, Faridkot, Fazilika, Firozpur, Ludhiana, Mansa, Moga, Mohali, Muktsar, Patiala, Ropar and Sangrur

The state of Punjab is comparatively more urbanized state with around 37%[5] of its total population residing in the urban area. This proportion is significantly higher compared to the national average of 31%. One interesting fact about Punjab is that its proportion of population living under below poverty line is lower in rural area(7.4%) as compared to urban area(17.6%). Agriculture has played an important role in ensuring higher per capita income in rural areas.

Climate: Himalayas in the north and Thar dessert in the south west have significant impact on the climate of Punjab. The climate of Punjab is characterized by extreme summer and harsh winter. Broadly, there are three distinct seasons which are summer, monsoon and winter. The summer starts from mid-April and lasts till the end of June. Summer are hot and daytime temperature can hover between 40-45 degree. Rainy season starts in the July and lasts till mid-September. The average annual rainfall in the state is 648 mm. Rainfall is higher in the regions situated close to foothills of Himalayas. Rainfall decreases as we move from north east to south. The winter season starts from end of November and lasts till the end of February. Winter are harsh and night temperature can fall below 5 degree.

Physiography: The physiography of the state is nearly homogeneous which can be described as flat plain. The exception to this is the areas lying in low ranges of Shivalik. Low ranges Shivalik area is situated in north and north east and it is known as Kandi area. According to the variation in physiography, the state can be classified into three regions which are flat plains, foot hill and hilly tract. Most of the area of the state lies in fertile alluvial plain, which makes it one of the most fertile region in the world.

2.2. Special Features and Advantages

Despite its small size, the state of Punjab has made significant contribution in overall national development on many fronts. Punjab is one of the most prosperous state of India. The economy of Punjab grew at significantly higher rate post green revolution period. Per capita income of Punjab was highest among al the states till 1991-

[4] https://punjab.gov.in/state-profile/
[5] The state economic survey 2019-20

92[6]. Agriculture has played a pivotal role in the state's economy since the time of green revolution. The state of Punjab is endowed with one of the most fertile region in the world. This region boasts of one of the highest per acre yield for wheat and paddy.

- **Well-developed agricultural ecosystem:** Agriculture has been the mainstay of the economy of the state since the time of green revolution. After the green revolution, Punjab has become the prominent producer of food grains in the country. It lies in fertile alluvial plain which is drained by number of rivers. It has well developed canal irrigation system. It is pertinent to note here that around 83% of the total area of the state is under cultivation[7]. The state has large network of regulated market for the sale of agricultural produce by the farmers. This holistically developed agricultural ecosystem makes the state especially suitable for agro-based food processing industry.

- **Economically developed and prosperous state:** The rural economic landscape of the state is especially prosperous with one of the lowest poverty rate. The high per capita income leads to high consumer spending resulting in attractive market for the various kinds of industry. The All-India rural financial survey highlights that the average monthly consumption expenditure for rural household is highest in Punjab at Rs 11, 707. It is significantly higher than the national average of Rs 6648. The same survey highlights that average monthly income for rural households in Punjab is highest among all the states at Rs 16, 020 against the national average of Rs 8,059.

- **Well-developed infrastructure:** The state ranks amongst the top in terms of well-developed infrastructure. Punjab was one of the first state to ensure road connectivity with metaled road for all its villages. It has one of the best road, rail and air connectivity among Indian states. The road density of the state is highest at 133km per 100sqkm[8]. Punjab is a power surplus state with 100% of villages and towns electrified. The state has domestic and international airports to ensure seamless air connectivity.

- **Highly successful Punjabi diaspora:** Punjab has large and successful diaspora spread across different continents across the world. The total number of Punjabi diaspora is around 30 lakhs which are majorly residing countries like Canada, USA, England etc. The successful Punjabi diaspora have significant positive impact on the economy of Punjab through sending large amount of remittance money back home. The state of Punjab receives around 1.7% of the total remittance coming to India from abroad[9].

- **Well established MSMEs industry:** MSMEs have played an increasingly important role in the development of industrial landscape in the state. There are more than 2 lac MSMEs units in the state of Punjab. The overall industrial landscape is dominated by textile, bicycle manufacturing, auto components, sports goods and agricultural implements. There are highly industrialized cities like Ludhiana, Mandi Gobindgarh which houses various types of industrial units.

2.3. Socio-Economic Overview

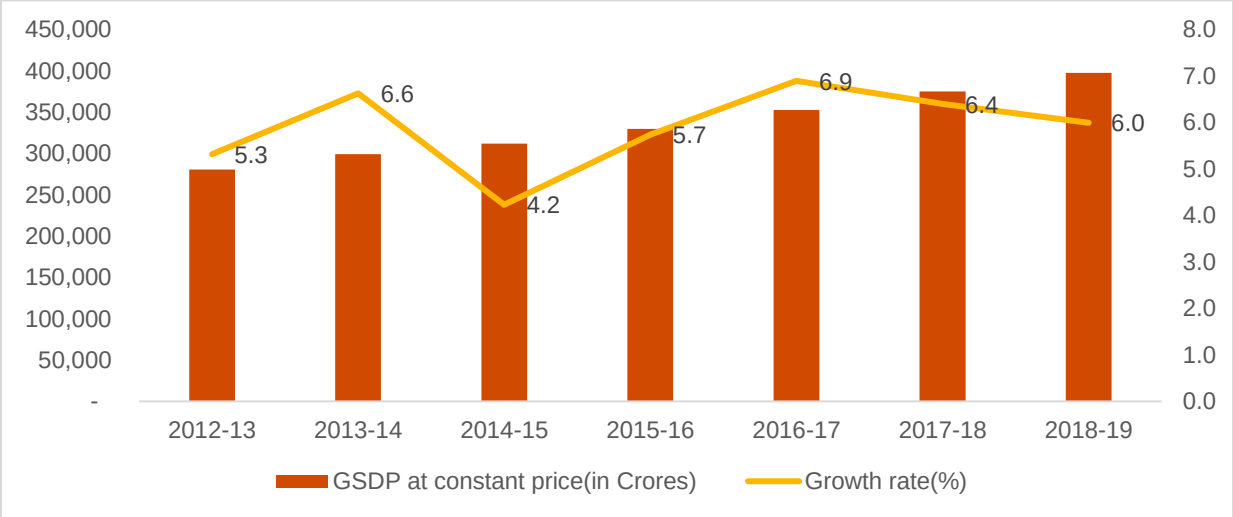
The state of Punjab has experienced high growth after the green revolution, which catapulted the state to become highest per capita income state. It remained the state with highest per capita income till 1991. The pace of growth

[6] https://pbplanning.gov.in/
[7] https://knowindia.gov.in/states-uts/punjab.php
[8] http://investpunjab.gov.in/
[9] *RBI Inward remittance survey 2016-17*

has slowed down in recent times. Agriculture has been the mainstay of the Punjab's economy since the time of green revolution.

2.3.1. Macroeconomic Overview

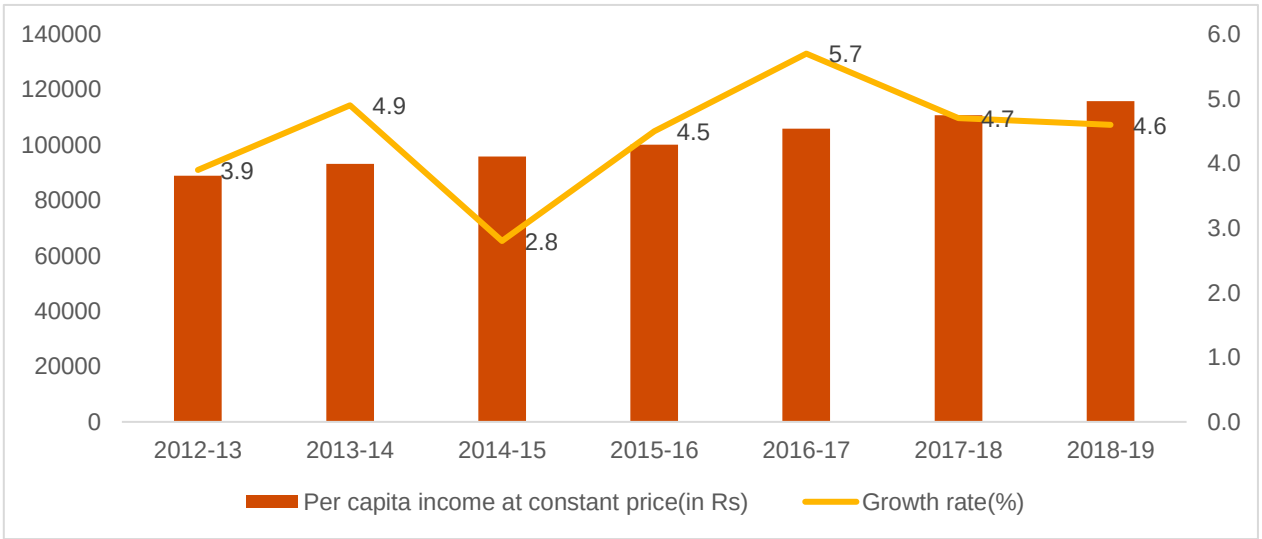
Although smaller in size, the state of Punjab has made significant contribution to the economic development of nation. This is especially true in agriculture, where Punjab played an instrumental role ensuring food security for the nation. The gross state domestic product of the Punjab is expected to be Rs 3.97 lakhs crore for 2019-20. it is the 15th largest state economy of the nation. The GSDP of Punjab has grown at an average of 5.9 between 2012-13 to 2018-19.



Graph 1: Yearwise Gross State Domestic Product

Overall GDP growth has remained slower as compared to India's growth during last 10 years. Structural changes are taking place in the economy of Punjab. Despite registering lower growth in recent years, Punjab is still counted as one of the most prosperous state in the country.

The per capita income[10] in Punjab stands at Rs 1,15,882/- which is significantly higher than the national per capita income[11] of Rs 92,085/-. The state of Punjab has experienced lower growth in per capita income during last two



Graph 2: Year wise per capita income and growth rate

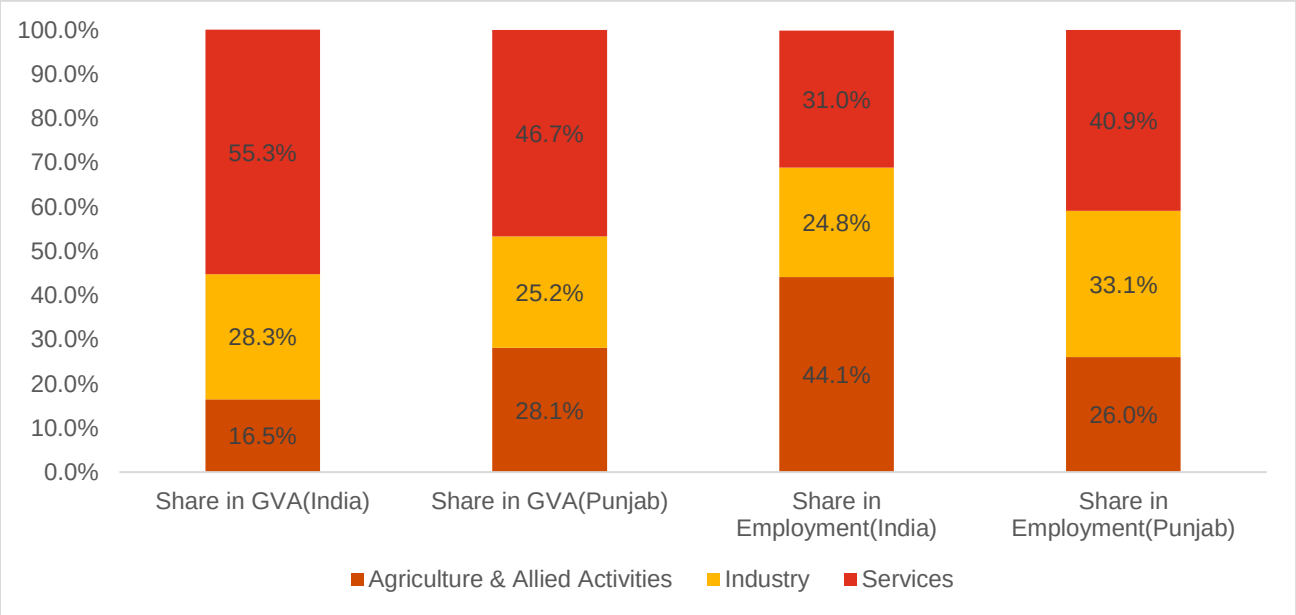
decades. Today, it ranks at 10th place among Indian states when it comes to per capita income. It is pertinent to note here that Punjab had the highest per capita income in the country till 1991-92.

[10] *Punjab State Economic Survey 2019-20*
[11] *Central Statistical Organization, Govt. of India, New Delhi.*

2.3.2. Punjab Economy-Sectoral Insights

The natural path of transformation for any economy is characterize by increased contribution of service sector with the economic development. The economy of Punjab is no exception as the share of service sector has seen consistent increase of share in the overall GSVA. The share of service sector has grown from 43% in 2004-05 to 46% in 2019-20. This trend is consistent with national trend, where service sector has the highest share in the economy. But at national level, service sector is followed by the industry and in Punjab agriculture comes at second place in contribution to overall GSVA. It is pertinent to note here that agriculture had been the major driving force of the state economy since the time of green revolution. Today, although the service sector contributes the maximum GSVA, but agriculture sector plays an important role in the overall development of other sector of the economy.

Following graph gives the sectoral overview of the Punjab's economy in comparison to India.



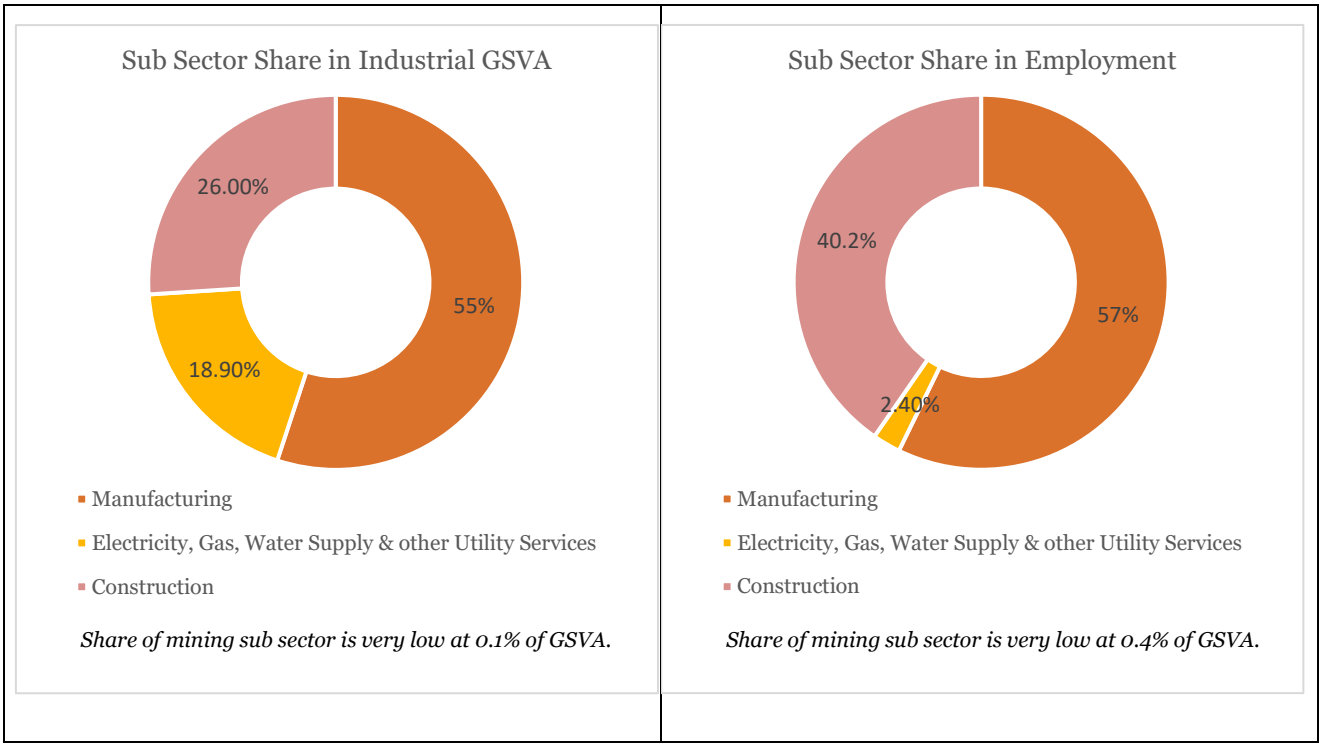
Graph 3: Comparative performance of Punjab vs national

Source: Punjab State Economic Survey 2019-20

Agriculture and Allied Sector: Agriculture and allied contributes around 28.1% of state's total GVA which is considerably higher in comparison to the sector's contribution to overall GVA of India(16.5%)[12]. One important highlight here is the employment share of agriculture sector in Punjab's economy. In spite of contributing higher share to total GVA, the proportion of people employed in agriculture sector is significantly lower at 26% as compared to 44% at India level. It points toward higher average income for agricultural households in Punjab as compared to the national level. It was also corroborated by the all India rural financial inclusion survey(AIFS)conducted by the NABARD in 2016-17. According to the AIFS, the average agricultural households' income in Punjab was highest among all Indian states at Rs 23,133/-. It was followed by Haryana at second place where average monthly income for agriculture household was Rs 18,946.

Industry Sector: Industry sector contributes 25.2% to the state's GVA as against the national average of 28.3%. Its share of employment stands at 33.1% against the national average of 24.8%[13]. The higher share in employment points toward the lower average income of households engaged in industrial activities as compared to the national level. Industry sector in Punjab is dominated by the manufacturing sub sector as it accounts for more than half the industrial sector GSVA.

[12] *Punjab State Economic Survey 2019-20*
[13] *Punjab State Economic Survey 2019-20*



Source: Punjab State Economic Survey 2019-20

Industrial hubs like Ludhiana, Mandi Gobindarh, Jalandhar and Mohali have clusters of industries related to cycle manufacturing, apparels, steel rolling, sports goods etc. Impressive growth recorded by the Punjab in agriculture after the green revolution led to the development of agri related industries like apparels and food processing. It has been estimated that agro based industries like food, beverages and apparels contributes around 40-45% of the total GVA in manufacturing. Therefore, agriculture can be considered as the driving force of the economy of Punjab as it had major impact on the development of industrial sector in Punjab. As per the state Punjab economic survey, food processing related factories units accounts for the 23% of the total registered operational industrial units in the state. Availability of raw material ensured through advanced level of agriculture is one of the important factor in the development of agro based industry in Punjab.

The industrial landscape in Punjab is dominated by the MSME units. There are more than 2 lac small scale units in the Punjab. More than 14.8 lac people are employed in these small-scale units. Food processing sector is especially dominated by the MSMEs with more than 66,000 micro and small units operating in the food processing sector.

Industrial development in the state has witnessed lower growth in the state as compared to other states. Presently the state is putting major emphasis on the industrial development through various steps. A holistic industrial and business development policy have been unveiled the state government with an objective of giving impetus to the industrial development in the state.

Service Sector:

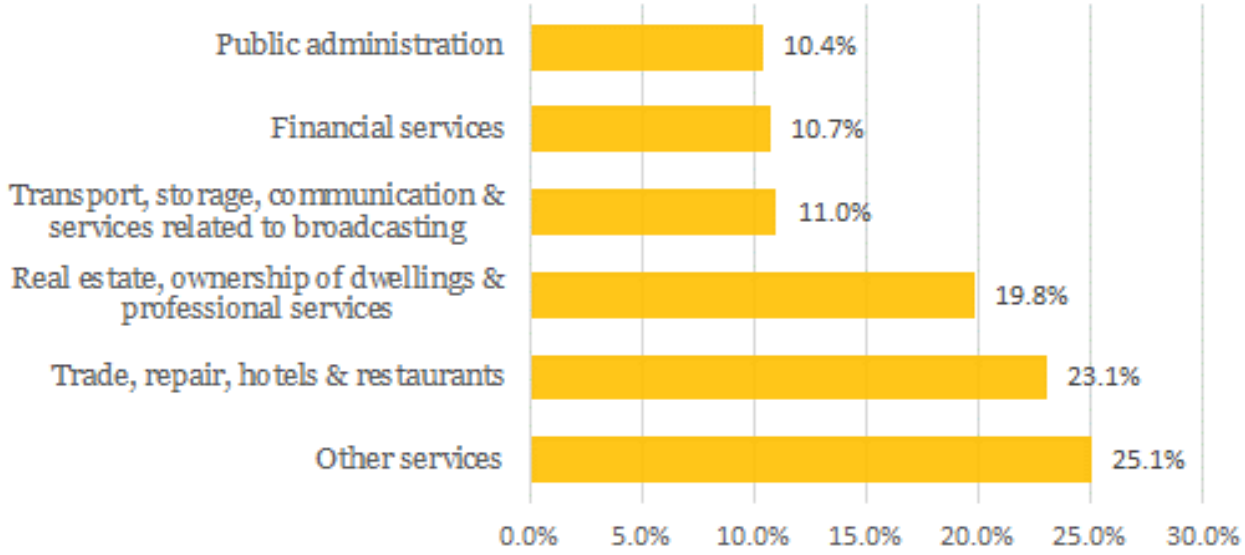
Service sector has emerged as the largest contributor to the economy of state as it is contributing 46.7% of the total GSVA and provide employment to 40.9% of workforce. At national level, the share of service sector stands at 55.3%, but it employs 31 % of the workforce[14]. It is pertinent to note here that in spite of lower contribution to GSVA, the service sector provides employment to larger proportion of population as compared to national level. It shows that income arising from service sector activities is more evenly distributed in the case of Punjab as compared to national level.

[14] *Punjab State Economic Survey 2019-20*

One important feature of the service sector in Punjab is that it provides employment to highest percentage of workforce after Kerala among comparable states[15]. It provides employment to 41% of the workforce against national average of 31%.

The economy of Punjab has undergone a structural transformation where service sector came to contribute the largest share of GSVA, which was earlier contributed by the agriculture sector. This is in line with the trend at national level, where also service sector is contributing the maximum share to overall GVA. During the period of 2012-13 to 2019-20, the service sector grown at higher rate than the overall economy. It is evident from the fact that growth rate in service sector GSVA was 7.2% as compared to 5.3% growth in overall GSVA. Following is the overview about share of different sub sector in service sector[16].

Trade, repairs, hotels & restaurant contributes the maximum share at 23.1%, which is followed by the real estate, ownership of dwellings & professional services at 19.8%[17].



Graph 4: Sub sector-service sector of Punjab

Source: Punjab State Economic Survey 2019-20

2.4. Importance of Agriculture in the Context of Punjab

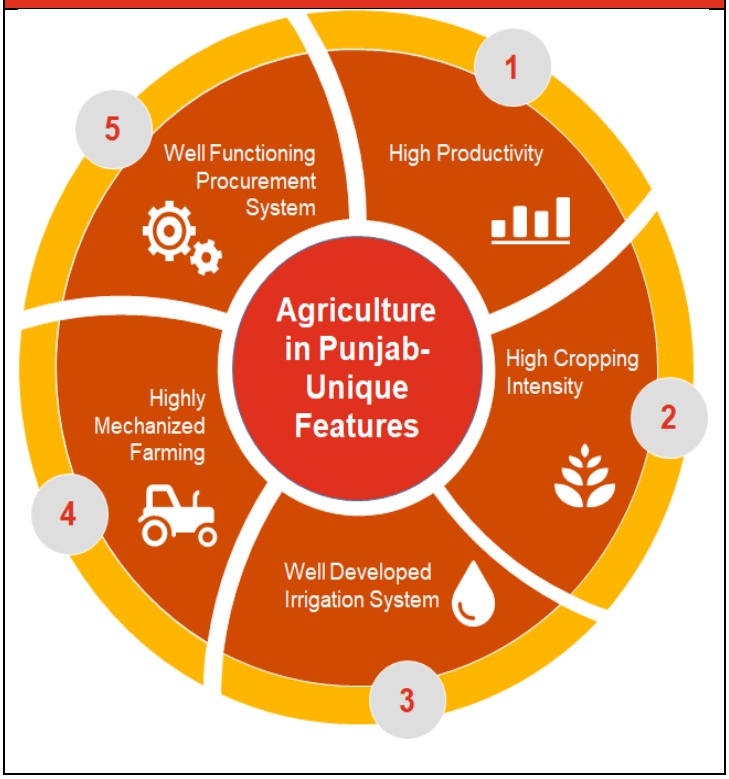
The importance of agriculture cannot be overemphasized given its crucial role in the rural economy and eradication or poverty. The economy of Punjab is no exception here as agriculture was the sector which propelled the growth of the state after the green revolution. The state of Punjab has earned names like “breadbasket of India” and “granary of India” due to its contribution in ensuring food security of the nation. The importance of Punjab’s agriculture sector can be gauged from the fact that despite having only 1.53% of total geographical area, the state of Punjab contributes around 25% rice and 35% wheat to the central pool[18].

2.4.1. Unique Features of Punjab’s Agriculture Sector

[15] Periodic Labour Force Survey, 2017-18
[16] *Punjab State Economic Survey 2019-20*
[17] *Punjab State Economic Survey 2019-20*
[18] *Punjab State Economic Survey 2019-20*

The state of Punjab along with Haryana and western Uttar Pradesh played an important role in the green revolution which ensured food security for the nation. Along with economy, the agriculture sector in Punjab holds an important place in the socio-cultural setting of the state. Agriculture in Punjab is highly mechanized and characterized by high productivity. Several unique features of Punjab's agriculture can be described as below.

Punjab Agriculture-Unique Features



- The agriculture in Punjab is characterized by high productivity. This high productivity of food grain enabled the Punjab to become biggest contributor of wheat and rice in central pool. This is why despite having only 12% and 7% of total area under wheat and rice cultivation respectively at the national level, Punjab produces around 18% of the wheat and 12% of the total rice at national level.
- The cropping intensity in Punjab stands at 190% which is significantly higher as compared to the national average of 130%. High cropping intensity plays an important role in ensuring the increased income for farmer's households in Punjab.
- Over 99% of the gross cropped area in Punjab is irrigated. Availability of well-developed irrigation sources means the agriculture in Punjab is not dependent on rainfall. Major source of irrigation in Punjab are tube wells, which irrigates around 71% of the land. 29% of the land is irrigated through canals.
- Agriculture in Punjab is highly mechanized as compared to the national level. High level of mechanization has resulted in improved productivity and efficiency.
- Punjab has well developed procurement system for agricultural produce, which incentivized the farmers to produce more through improved productivity. There are more than 400 regulated agricultural markets in the Punjab. More than 90% of the produced paddy is procured through regulated agricultural market.

Total area under cultivation in Punjab is around 41.2 lac hectares, which is around 82% of the reported area. Such large area under crop shows the predominance of agriculture in Punjab's context. It is pertinent to note here that given the high proportion of land already under cultivation, scope for increasing the area under cultivation is very limited.

Cropping Pattern: Majority of the cultivated land is devoted for the cultivation of food grains in Punjab. As per the economic survey 2019-20, around 93% of the total cultivated land was used for the cultivation of food grains including pulses and cereals. Wheat and paddy cultivation occupy the central place as these two crops have the highest share in the total cropped area. Around 84% of the total cropped area is devoted to cultivation of these two crops[19].

[19] Department of agriculture, Govt. of Punjab

Table 1: Cropping pattern of Punjab

Sr. No	Crop	Percentage Share in Crop Area
1	Wheat	44.90%
2	Paddy	39.60%
3	Cotton	5.10%
4	Vegetables	3.30%
5	Other Crops	2.40%
6	Maize	1.40%
7	Sugarcane	1.20%
8	Fruits	1.10%
9	Oilseed	0.50%
10	Pulses	0.40%
11	Barley	0.10%

Source: Department of Agriculture, Govt. of Punjab

Assured economic returns through well-established procurement system contributed to the dominance of wheat and paddy crop. The high portion of area and high yield of wheat and paddy resulted in Punjab becoming the major producer state of these two crops. However, it is pertinent to note here that increased dependence on paddy wheat crop cycle has resulted in undesired consequences like soil deterioration depletion of water table, high input cost, and overuse of fertilizers & pesticides. It has become imperative to make efforts for crop diversification in order to break the unsustainable paddy wheat cycle.

3. Government initiatives to catapult the food processing sector

3.1. Overall policy landscape of Indian FPI and FPI micro enterprises sector

This section will assess the policies framework operational having direct or indirect impact on unorganized sector participation in the food processing. A broad snapshot of overall national policy environment for food processing micro enterprises would be presented here.

3.1.1. PM Kisan SAMPADA Yojana

PM Kisan SAMPADA Yojana is a comprehensive package aiming to create modern infrastructure with efficient supply chain management from farm gate to retail outlet. The scheme boosts the growth of the food processing sector in the country and helps in providing better returns to farmers as well. It is a big step towards creating huge employment opportunities in the rural areas, doubling the farmers' income, increasing the processing level, reducing wastage of agricultural produce, and enhancing the export of processed foods.

Features of PM Kisan SAMPADA Yojana

- PMKSY has an outlay of 6000 crores and expected to leverage investment of INR 31,400 crores
- The scheme was implemented in the year 2019-20.
- The scheme aims at integrating existing and new schemes targeted at reducing food wastage, provide quality food to consumers at reasonable prices, and at the same time doubling farmer's income.
- SAMPADA is an umbrella scheme with its period coterminous with the cycle of the 14th finance commission. It has various schemes within its gamut.

Schemes under PMKSY

PMKSY is an umbrella scheme comprising of various schemes like

i. **Mega Food Parks:** The Mega Food Park Scheme is based on "Cluster" approach and envisages creation of state of art support infrastructure in a well-defined agri / horticultural zone for setting up of modern food processing units in the industrial plots provided in the park with well-established supply chain. Mega food park typically consists of supply chain infrastructure including collection centers, primary processing centers, central processing centers, cold chain and around 25-30 fully developed plots for entrepreneurs to set up food processing units.

ii. **Integrated Cold Chain and Value Addition Infrastructure:** The objective of the Scheme of Cold Chain, Value Addition and Preservation Infrastructure is to provide integrated cold chain and preservation infrastructure facilities, without any break, from the farm gate to the consumer. It covers creation of infrastructure facility along the entire supply chain viz. pre-cooling, weighing, sorting, grading, waxing facilities at farm level, multi product/ multi temperature cold storage, CA storage, packing facility, IQF, blast freezing in the distribution hub and reefer vans, mobile cooling units for facilitating distribution of horticulture, organic produce, marine, dairy, meat and poultry etc. The scheme allows flexibility in project planning with special emphasis on creation of cold chain infrastructure at farm level.

iii. Food Safety and Quality Assurance Infrastructure

iv. **Infrastructure for Agro-processing Clusters:** The scheme aims at development of modern infrastructure and common facilities to encourage group of entrepreneurs to set up food processing units based on cluster approach by linking groups of producers/ farmers to the processors and markets through well-equipped supply chain with modern infrastructure. Each agro processing clusters under the scheme have two basic components i.e. Basic Enabling Infrastructure (roads, water supply, power

supply, drainage, ETP etc.), Core Infrastructure/ Common facilities (ware houses, cold storages, IQF, tetra pack, sorting, grading etc.) and at least 5 food processing units with a minimum investment of Rs. 25 crores. The units are set up simultaneous along with creation of common infrastructure. At least 10 acres of land is required to be arranged either by purchase or on lease for at least 50 years for setting up of Agro Processing Cluster.

v. **Creation of Backward and Forward Linkages:** The objective of the scheme is to provide effective and seamless backward and forward integration for processed food industry by plugging the gaps in supply chain in terms of availability of raw material and linkages with the market. Under the scheme, financial assistance is provided for setting up of primary processing centers/ collection centers at farm gate and modern retail outlets at the front end along with connectivity through insulated/ refrigerated transport.

vi. **Creation / Expansion of Food Processing & Preservation Capacities:** The main objective of the Scheme is creation of processing and preservation capacities and modernization/ expansion of existing food processing units with a view to increasing the level of processing, value addition leading to reduction of wastage. The processing activities undertaken by the individual units covers a wide range of post-harvest processes resulting in value addition and/or enhancing shelf life with specialized facilities required for preservation of perishables. While expansion of processing capacity is necessary to increase the level of processing and reduce wastage, the induction of modern technology is intended to make a clear difference in terms of process efficiencies as well as improving the quality of the end product. The setting up of new units and modernization/ expansion of existing units are covered under the scheme.

vii. **Operation Greens:** The Operation Greens scheme is based on the line of "Operation Flood", with an outlay of Rs.500 crore to promote Farmer Producers Organizations (FPOs), agri-logistics, processing facilities and professional management. Accordingly, the Ministry has formulated a scheme for integrated development of Tomato, Onion and Potato (TOP) value chain initially. Later on, the scheme was expanded for all horticultural crops.

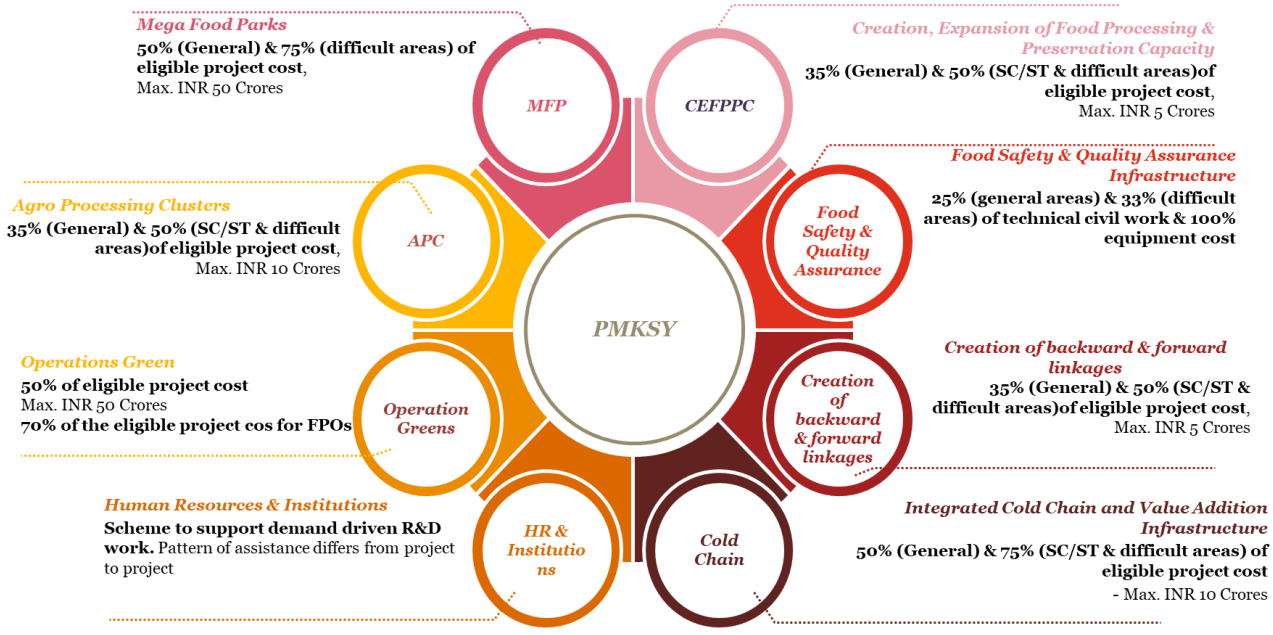


Figure 3: Snapshot of pattern of assistance of schemes under PM Kisan SAMPADA Yojana

Implementation of PM Kisan SAMPADA Yojana

- The Ministry of Food Processing Industries (MOFPI) has approved the establishment of 42 Mega Food Parks, 56 Agro Processing Clusters,236 Integrated Cold Chains, 284 stand alone food processing units under CEFPPC scheme with a view to creating a modern infrastructure for food processing along the value chain from the farm to the market.
- Steps are being taken to boost the food processing sector in order to fulfill the objectives of bringing down post-harvest wastages and losses preferably to zero levels.

- The scheme intends to identify agro clusters and grant them subsidies so that the transfer of food products from the producing centres to the market becomes seamless.
- SAMPADA aims at the entire linkage and plugging gaps in the supply chain, modernization/ expansion of existing food processing units, creation of processing and preservation capacities, etc. It is an all-inclusive package to give a renewed thrust to the food processing sector in India.
- The scheme will benefit the farmers by increasing their income, generate employment opportunities, stimulate the export of processed food and reduce food wastage.

3.1.2. Foreign Direct Investment (FDI)

Government has permitted 100% FDI under the automatic route in food processing industries. It has also allowed 100% FDI through Government Approval route for trading (including e-commerce) in respect of food products manufactured in India.

3.1.3. Start-up India

The programme was announced in January 2016 with an action plan for promoting the bank financing for Start-Up ventures to boost the entrepreneurship and encourage start-up with job creation. As per the Department of Industrial Policy and Promotion (DIPP), a Start-up means an entity incorporated or registered in India not prior to seven years (for biotechnology not prior to ten years) with an annual turnover not exceeding INR 25 crore in any preceding financial year working towards innovation, development or improvement of products, processes or services or if it is a scalable business model with a high potential of employment generation or wealth creation. Small Industries Development Bank of India (SIDBI) has developed a SIDBI Start-up Mitra portal wherein the details of advantages of the State-specific policies and schemes can be explored. NABARD also invests in Venture Capital Funds (VCFs) to facilitate venture investments in agriculture and rural development so as to promote technological innovations and technology dissemination in the sector. NABARD's commitments in VCF have led to venture capital investments to the tune of ` 650 crore in 37 portfolio companies. Noteworthy innovations which may be related to the food processing sector are solar operated micro cold storages and solar dryers, supply chain aggregation through mobile application platform, etc.

To promote startups in the state, government is giving special assistance to the startups. A cell under Department of Industries and Commerce headed by Director Industries and Commerce is providing necessary secretarial and technical support to the startup coordination committee. The cell shall also act as a single point of contact with Government departments where the Startup needs to implement their projects. The role of this cell would be to highlight, amalgamate and disseminate the resources, funding mechanisms, investments, incentives available at a single portal for Startups in Punjab or Startups looking to relocate to Punjab.

All the benefits available to MSMEs in the state industrial policy shall also be available to start-ups. In addition, following additional incentives shall also be available to start-up enterprises:

(i) **Interest Subsidy**

Eligible Startups shall be provided interest subsidy of 8% per annum for a period of 5 years on the rate of interest paid on loans obtained from scheduled banks/financial institutions subject to the maximum limit of INR 5 lakh per annum.

(ii) **Lease rental subsidy**

Reimbursement of 25% of lease rental subsidy to eligible Startup units established in the State, operating from Incubators/IT Parks/Industrial Clusters or any other notified location shall be eligible for a period of 1 year subject to the ceiling of INR 3 lakh per annum.

(iii) **Seed Funding**

A Seed Grant up to INR 3 Lakh per start-up shall be provided for validation of idea, prototype development, assistance towards travelling costs and carrying out field/ market research/ skill training/ marketing and initial activities to setup a Startup etc. Seed funding to Startups would be routed through State/Centre recognized Incubators or Nodal Agencies.

3.1.4. Stand up India

The Stand-up India scheme was launched by Government of India in April 2016 to support at least one SC/ST and one women entrepreneur per bank branch to set up greenfield enterprises in manufacturing, services or the trading sector and become job creators. Over 16,000 new enterprises have come up through this scheme in activities as diverse as food processing, garments, diagnostic centres, etc. The scheme offers a huge opportunity for the investors in the food processing sector. The guidelines for Stand-up India Scheme can be accessed at www. standupmitra.in. SIDBI operates and maintains the Stand-up India portal and acts as connect centre along with NABARD. The role of NABARD in the scheme is to arrange the handholding support for trainee borrowers, liaise with the banks for follow-up in potential cases, review and monitor through District Level Committee and organise events for experience sharing, etc.

3.1.5. Skill India

The skill development in food processing industry is one of the major challenges today. There is dearth of skilled manpower. As per a study conducted by National Skill Development Corporation (NSDC) on human resources and skill requirement in food processing sector, the annual human resource requirement in food industry is estimated at 5.3 lakh people, including one lakh, in organised sector. Skill India programme was launched in July 2015 to train a minimum of 300 million people in India in different sectors by 2022. The following are some of the flagship programmes of Government of India for promoting skill development in the countr;

3.1.5.1. Pradhan Mantri Kaushal Vikas Yojana(PMKVY 3.0)

The scheme was launched by GoI in July 2015 to skill one crore youth of the country with an outlay of INR 12000 crore. It is being implemented by the NSDC. The PMKVY (2016-2020) was implemented by the centre along with the states which has three training formats, viz. Short Term Training (STT), Recognition of Prior Learning (RPL) and Special project. Pradhan Mantri Kaushal Kendra (PMKK) plays a crucial role in imparting vocational training to the youth. The Government has set up a Food Sector Skill Council called Food Industry Capacity & Skill Initiatives (FICSI) in Federation of Indian Chambers of Commerce and Industry (FICCI) which is promoted by FICCI with financial support by NSDC. It has 46 affiliated Training Partners and 192 Training Centres across 26 States in the country. FICSI is working on identification of job roles and competencies required for each job role so as to develop National Occupational Standards for different sectors of food processing. The two institutions under the administrative control of MoFPI, i.e. National Institute of Food Technology Entrepreneurship and Management (NIFTEM), Haryana and Indian Institute of Food Processing Technology (IIFPT), Tanjavur, Tamil Nadu are conducting regular trainings in food processing on self-financing basis & sponsored funds from others sources including under PMKSY.

Under PMKVY, training is imparted for pickle making technician, traditional snacks and savoury maker, baking technician, mixing technician, plant biscuit production specialist, etc. The number of candidates trained under the RPL and STT under food processing stood at 2119 and 1038 respectively as on 24.08.2017.[20]

The third phase of Pradhan Mantri Kaushal Vikas Yojana (PMKVY 3.0) was launched in January 2021 across 600 districts across all states of India.

[20] Website of PM Kaushal Vikas Yojana

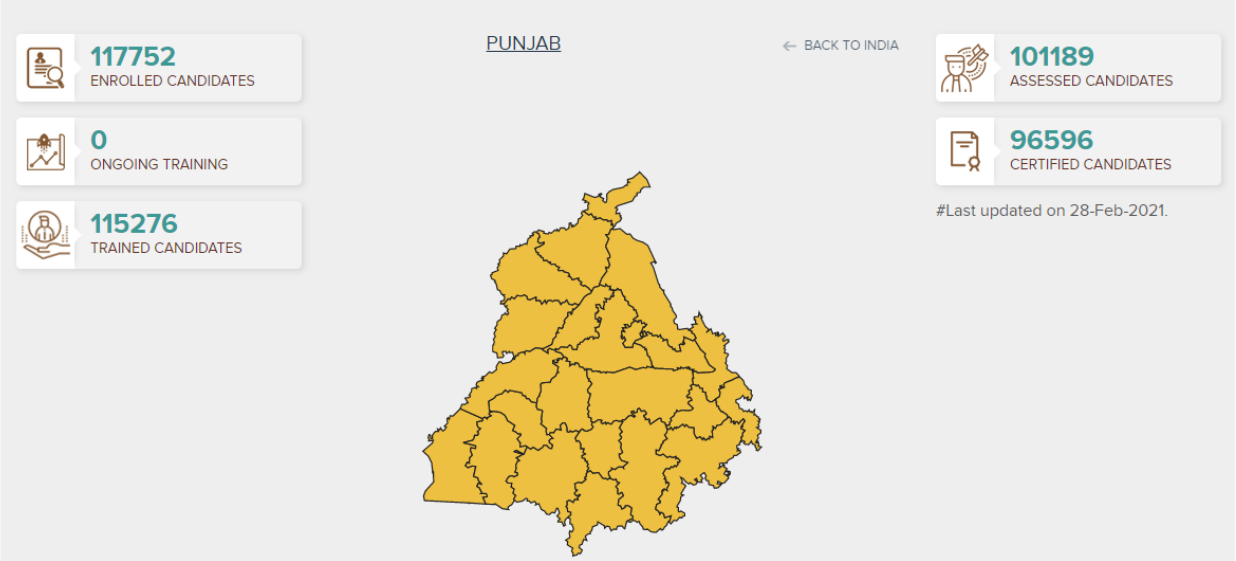


Figure 4: Dashboard for number of candidates trained under PMKVY in Punjab

Source: Website of Pradhan Mantri Kaushal Vikas Yojana

3.2. Overall policy landscape of state FPI and FPI micro enterprises sector

The major acts/rules/ policies/schemes from the perspective of food processing will be elucidated highlighting current scenario, gaps and interventions required will be identified for each act/policies/scheme.

3.2.1. Industrial Policy 2017 and amendment 2018

Overview and Salient Feature

The industrial and business development policy 2017 has been designed by the Department of Industries and Commerce under Government of Punjab with an objective of putting Punjab on high trajectory of growth. This policy encompasses a holistic approach and endeavor to provide enabling environment for development of industry in the state through an integrated framework. Along with providing direct fiscal incentive to industry, the policy also focuses on creating enabling ecosystem for the development of industry. The policy aims to create an enabling ecosystem through ushering required reforms, restructuring of institutions to help the industry in overcoming various challenges and constraints. One of the major highlights of the policy is its emphasis on business centric approach to help the industries during various phases of lifecycle. It goes on to envisage realignment and restructuring of various government institutions in line with the framework of the policy. The policy envisaged the vision of developing the state as one of the most economically developed states in the country along with ushering reform to ensure ease of doing business. The policy has clearly defined the mission statements and goals to be achieved for ensuring desired outcomes. These goals are quantified and aligned

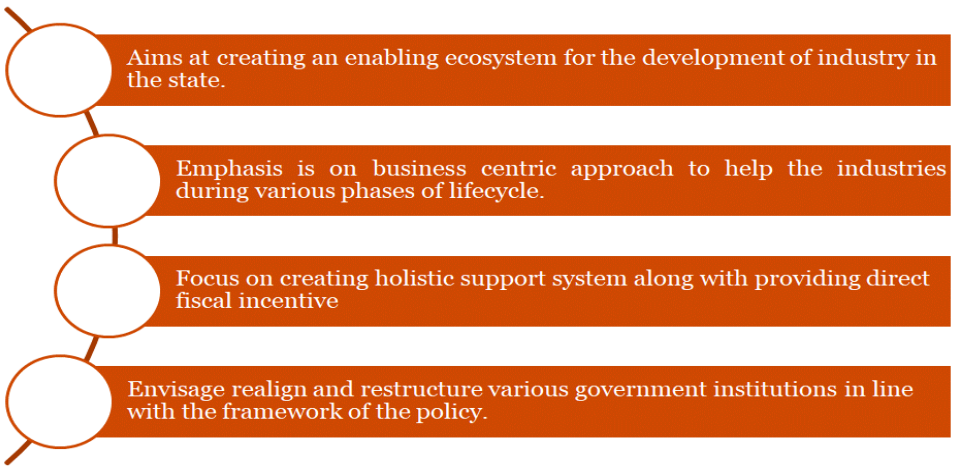
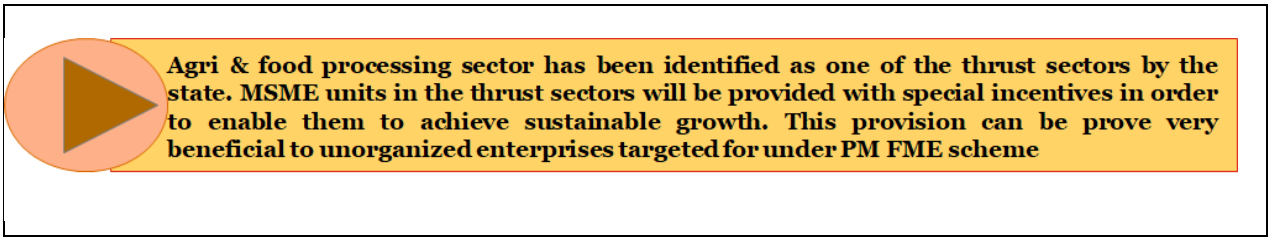


Figure 5:Salient features of the policy

with the overall vision of the policy. The policy has been designed with a focus on defined eight pillars for achieving the holistic industrial growth for the state. These eight pillars are: Infrastructure, Power, Micro, Small and Medium Enterprises Ease of Doing Business, Startup and Entrepreneurship, Skills, Fiscal and Non-Fiscal Incentives and Stakeholder Engagement.

Relevance to MSM Units and Food Processing Sector

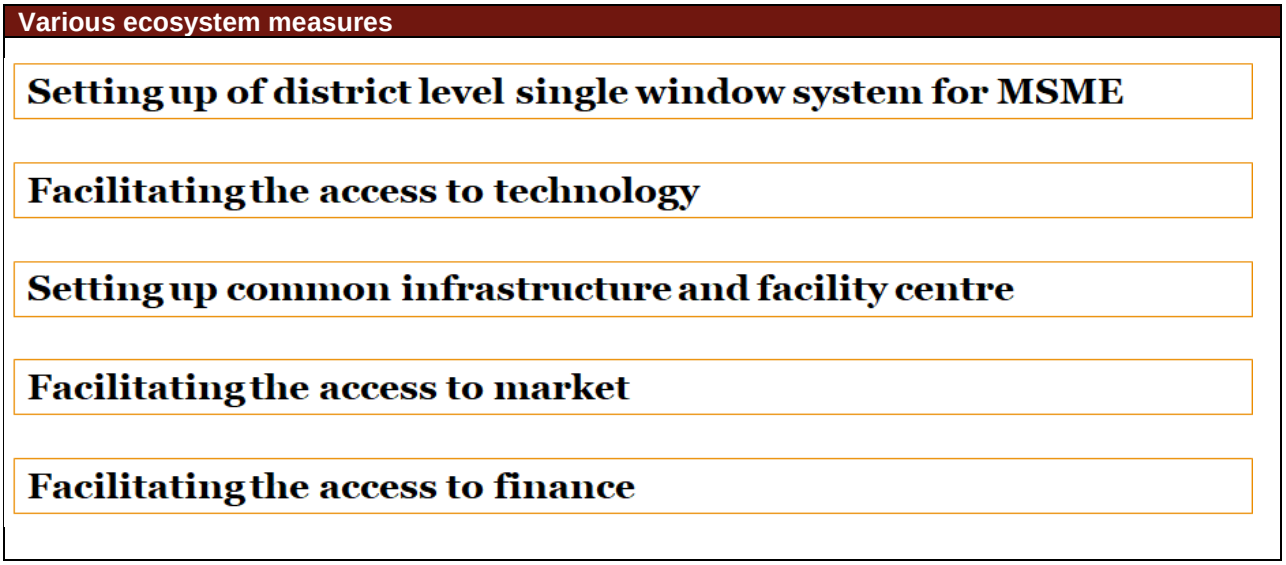
The policy places special emphasis on development of MSM units and food processing sector. The state has identified some sector as thrust sector given their potential for future growth and employment generation in the state. Agri & food processing sector has been identified as one of the thrust sectors by the state. The policy recognizes the fact that the MSME units can play a pivotal role in providing large employment opportunities at comparatively lower cost. The policy envisaged to set up 'MSME Punjab' as part of the Punjab industrial and business development authority to focus on the development of MSMEs. The major objective of 'MSME Punjab' will be to enable the MSM units in overcoming various challenges and constraints through creating better support structure.



The policy places emphasis on cluster approach for the development of MSMEs in the state. The policy states that development of agri and food processing cluster would be prioritized in phase 1. For better understandings, the interventions designed under the policy for the MSME units and food processing sector can be categorized into two categories.

Ecosystem Support Measures

The policy outlines various measures which are aimed at providing holistic support for the growth of MSME in the state. These measures range from easing the various regulatory requirements to increasing the access to finance, technology and market through institutional support to MSME.



- **Setting up of district level single window system for MSME:** The policy envisaged to establish district level single window system for MSMEs for regulatory and support services. This single window system will be particularly helpful for ensuring accessibility of MSMEs to various kind of services.

- **Facilitating the access to technology:** The policy aims to facilitate the easy access to technology through various measures. *These measures offer great potential for convergence with PM FME scheme*. Setting up of technology centre at cluster level is one such measure which will act as a hub for research

and demonstration, incubation, training and capacity building. These centres can act as catalyst for increasing the competitiveness of micro food processing enterprise under PM FME scheme.

- **Setting up common infrastructure and facility centre**: The policy also emphasizes on setting up of common infrastructure and facility centres at cluster level. *These common infrastructure and facility centres can help the micro food processing enterprises in accessing the latest facilities which requires high amount of investment*. Convergence with PM FME scheme can play a pivotal role as increased access to common services is also one of the objectives under PM FME scheme.

- **Facilitating the access to market:** The policy outline various measures to facilitate the easy access to market by MSME. *Increased access to market is also one of the objectives under PM FME scheme and convergence between with the policy measure can help in achieving the desired outcomes on marketing front.* The policy aims to facilitate the access through measures like linkages with E-commerce platform, forecasting trends, organizing events like buyers seller meet & vendor development program, financial assistance for showcasing the product at local, national and international events.

- **Facilitating the access to finance:** The policy outline various measures to facilitate the easy access to finance for MSMEs. It focuses on measures like handholding support in seeking credit from financial institutions for micro small and medium enterprises. *There is a great scope of convergence with PM FME scheme here as credit linkages of micro food enterprises is major one of the major objectives under PM FME scheme.*

Direct Financial Incentives and Exemptions

The policy proposes direct financial incentives to MSME for helping them to achieve sustainable growth. These measures are designed keeping in view the needs of MSM units at various stages of their lifecycle. Agro and food processing sector has been made eligible for added incentives and exemptions by virtue of being thrust sector under the policy. For better understanding these measures have been categorized into various categories as following.

Finance related incentive and exemptions

- Reimbursement of 100% of net SGST for 10 years from date of commercial production.
- Interest subsidy @5% per annum in border district and kandi districts subject to maximum of Rs 10 lakhs per year for 3 years.
- Interest subsidy @5% per annum to SC entrepreneur/Women entrepreneurs subject to maximum of Rs 10 lakhs per year for 3 years.
- Additional state support subsidy of 5% per annum under credit linked capital subsidy scheme of Ministry of MSME, GOI.

Infrastructure related incentive and exemptions

- 100% exemption for 10 years from paying electricity duty with fixed tariff of Rs. 5 per KVAH for 5 years.
- 100% exemption from paying stamp duty on purchase or lease of land and building.
- 100% exemptions from CLU/EDC.
- 100% exemptions from paying property tax for 10 years

Technology related incentive and exemptions

- 50% of the cost subject to maximum of Rs 25 lakh for adopting technology from a recognized national institute.

- Reimbursement of 50% of expense to maximum of Rs 5 lakh incurred on plant and machinery for obtaining at least bronze category status under ZED scheme. ZED scheme is a central government scheme aimed at help MSMEs to strive continuously to improve its processes.
- Financial support of 50% of capital cost subject to maximum of Rs 25 lakh for setting up of effluent treatment plant and for installation of air control devices.

Marketing related incentives and exemptions

- 100% exemptions for all taxes and fees paid for the purchase of raw material for food processing units up to 10 years for all category of units.
- Assistance of Rs 5 Cr to MSME Punjab for assisting the industry in organizing vendor development programs, buyers-sellers meets, reverse buyers-sellers meet.
- Assistance to MSMEs for showcasing their product at local, national, and international event.
- Annual award of Rs 3 lakh per unit for excellence in productivity, quality, export for each category of enterprise.

3.2.2. Schemes/programme to support SHGs/FPOs etc.

3.2.2.1. Scheme for Formation and Promotion of 10,000 Farmer Producer Organizations

Overview and Salient Feature

It is a newly launched scheme to promote 10,000 FPOs with an outlay of INR 6865 crores. The scheme will be implemented in all states through implementing agencies. The scheme is based on cluster based approach, so that economies of scale and market access for members can be improved. The scheme would provide handholding and support to new FPOs up to 5 years from the year of creation in all aspects of management of FPO, inputs, production, processing and value addition, market linkages, credit linkages and use of technology etc.

Under this scheme FPOs will be provided financial assistance up to Rs 18.00 lakh per FPO for a period of 03 years. In addition to this, provision has been made for matching equity grant up to Rs. 2,000 per farmer member of FPO with a limit of Rs. 15.00 lakh per FPO and a credit guarantee facility up to Rs. 2 crore of project loan per FPO from eligible lending institution to ensure institutional credit accessibility to FPOs.

3.2.2.2. Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM)

Overview and Salient Feature

Deendayal Antyoda Yojna-National Rural Livelihoods Mission(DAY-NRLM) is a flagship program for poverty reduction in rural area through building strong community-based institutions of rural poor women. It was launched in 2011 by restructuring the old SGSY (Swarnjayanti Gram Swarozgar Yojna). The program aims at building strong institutional platform for the rural poor which can play an enabling role in poverty reduction through sustainable livelihoods enhancement and improved access to financial services. At the grass root level, rural poor are mobilized to form SHGs(Self Help Group) and one SHG usually consist of 10-12 members. These SHGs are federated to form larger institutions like VO(Village organization) and CLF(Cluster Level Federation). Thus, ma multi-tier structure of community-based

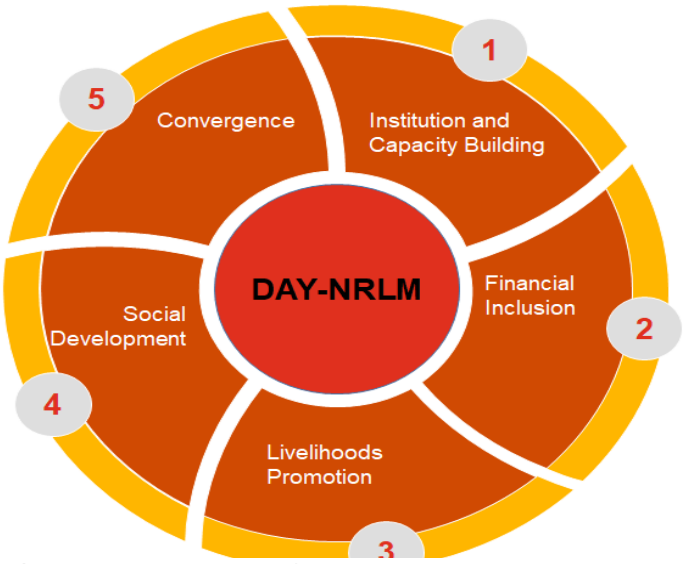


Figure 6: Components of DAY-NRLM

institutions is created under the program. These institutions serve as platform to facilitate the delivery of social and economic services to the poor. The program aims to achieve the mission through adopting a holistic approach encompassing different thematic components. These components are Institution and capacity building, financial inclusion, livelihoods promotion, social development and convergence. Economic activities are undertaken at the group and federation level to leverage the economy of scale provided through platform created by institutional structure

SRLMs(State Rural Livelihoods Mission) are established by the state government to oversee the overall implementation of the program components. Punjab State Rural Livelihoods Mission(PSRLM) is the nodal agency in Punjab for the implementation of the NRLM activities in the state of Punjab. Initially in 2012-13, the activities were undertaken in 5 resource blocks namely Sanour, Sunam, Guruharsahai, Valtoha and Dhariwal in Patiala, Sangrur, Ferozepur, Tarntaran and Gurdaspur Districts respectively. The mission was extended to all the 22 districts of Punjab in the year 2016-17.

3.2.2.3. Farmer Producers Organization (FPOs): Policy for the state of Punjab

Overview and Salient Feature

The farmers of Punjab especially small and marginal farmers are passing through a tough time with limited resource availability, rising input prices, higher vulnerabilities to climate and market risks. It is expected that in Punjab, small farmers are going to Increase in future as the land holding is further going to get fragmented. The small land holding will make it difficult for farmers to carry out agricultural practices economically. The challenge, therefore, is to identify sustainable solutions that are efficient, environmentally friendly and at the same time inclusive in terms of addressing the needs of the small farmers. Farmer Producer Organization (FPO) can provide one such opportunity, FPOs aim at providing better income for the producers through an organization of their own. Through aggregation, the primary producers can avail the benefits of economies of scale.

Punjab Agri Export Corporation Limited (PAGREXCO) is the State Nodal Agency (SNA) to function as a catalytic/ facilitating agency to promote agribusiness activities through FPO's in the State of Punjab. The SNA works towards encouraging the setting up of FPOs, identification of already registered FPOs, which could benefit through different schemes and project development facility of SFAC plan. SNA is a single window institution to FPOs and to facilitate the linkages to investments, technology and markets. SNA will provide all-round support to FPOs and other entities engaged in promotion and development of FPOs in Punjab. Further, it will also create sustainable linkages between FPOs, and inputs suppliers, technology providers, extension and research agencies and marketing and processing players both in the public and private sectors. SNA will work to build-in provision for providing marketing intelligence, empanelment / hiring of auditors, monitoring, evaluation and other backup support services required by each FPO.

The scope and coverage of the scheme is as follows:

i. The provisions of this policy apply equally to FPOs already registered either under the Companies Act or under Societies Registration Act, 1860 or under various central and state cooperative society laws and those FPOs which will be registered subsequent to the issue of this policy.
ii. The main qualifying criterion for FPO to attract benefits under this policy is that it must be a body registered and administered by farmers and the organization must be focused on activities in the agriculture and allied sectors.

The financial support shall be given to both FPOs as well as the SNA. The details in respect of amount, duration, conditions and procedure shall be laid down in a separate process document by the SLC.

i. Direct Taxes Subsidy: Income tax exemption has already been given by Government of India (GoI) for 5 years and upto 100 crore turnover for FPO's.
ii. **Interest Subsidy:** FPOs Registered with State Nodal Agency shall be eligible for interest subsidy as decided by the SLC on the outstanding loan amount. The details of modalities shall be worked out separately. This subsidy shall be on both term as well as working capital loans. The duration and limit of subsidy per FPO shall be as decided by SLC from time to time
iii. **Assistance for Awareness and Creation of FPOs:** State Nodal Agency shall create awareness among the farmers, women and youth to create FPOs to enhance their income. As this policy aims

at creating volunteer-based organizations, this aspect shall form a significant part of the Policy. The SNA will develop the networks with other institutions to carry out awareness about FPOs. State Nodal Agency will appoint coordinators to act as nodal resource person for this activity.

iv. **Assistance for diagnostic study and business plan:** The SNA shall carry out detailed diagnostic study highlighting the market opportunities coupled with the strengths of the group and to prepare the Action plan and Business Plan for FPO.

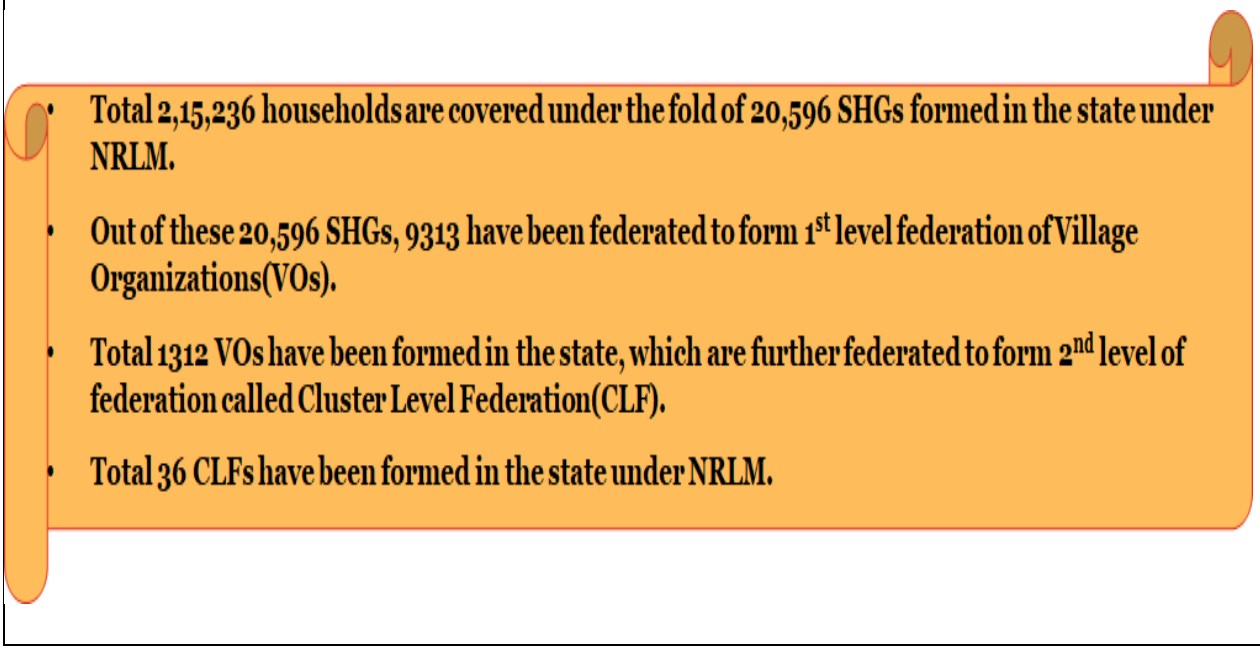
v. **Assistance for soft intervention:** SNA shall carry out various soft interventions such as trainings (both technical and managerial), demonstrations, sharing business opportunities, exposure visits, trust building exercises etc. for the FPO members as per the suggested action plan based on the findings of Diagnostic Studies

vi. **Assistance for hard intervention:** The financial assistance shall be provided to create infrastructure/Common facilities centre as required by the FPOs. The limit for such intervention shall be as fixed by SLC.

Rational and Opportunities for Convergence with PM FME Scheme

One of the major aims of the PM FME scheme is to provide support to farmers producer organizations(FPOs), Self Help Group(SHGs) and Producer Cooperative along with their entire value chain. FPOs, Cooperatives and SHGs are different form of collective organizations which are generally provided with handholding and capacity building support by promoting institutions. When it comes to formation and strengthening of SHGs, NRLM is the flagship program of central government and Punjab State Rural Livelihoods Mission is the implementation agency responsible for the overall implementation of the said program in state of Punjab. The total number of SHGs formed under the NRLM program stand at 20, 596. These SHGs are formed in 105 blocks in 22 districts of the state. This is a huge number and following points are worth considering in this regard.

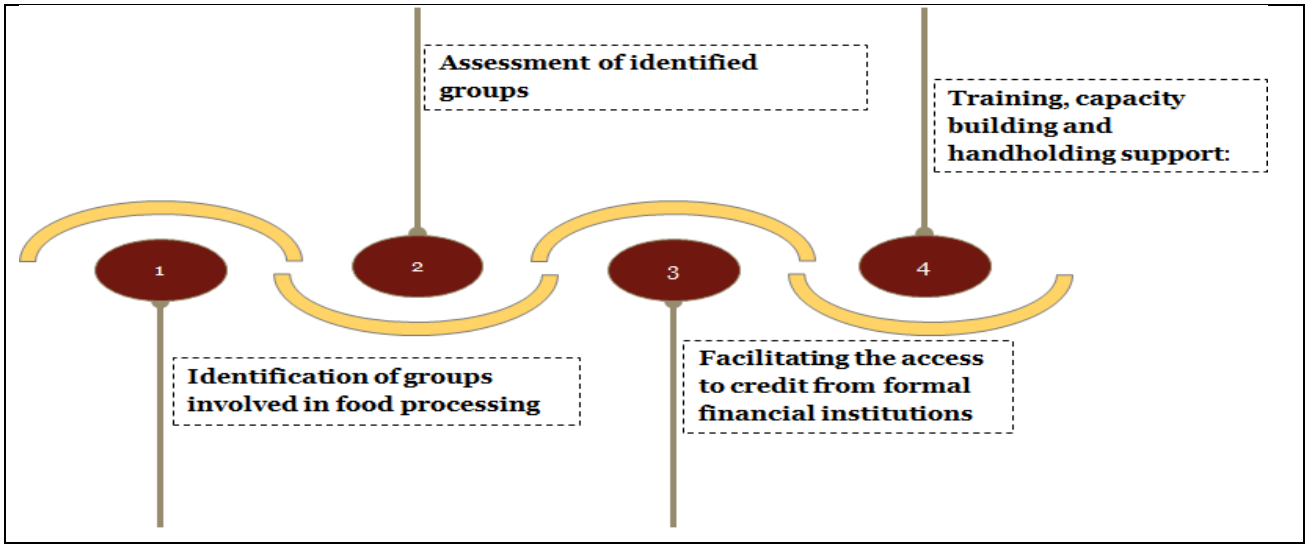
Snapshot of Progress made under NRLM in Punjab[21]



From the above data, it is evident that large number of SHGs comes under the SRLM and therefore convergence with SRLM will be of prime importance to achieve the overall objective of the PM FME scheme in state. *Close coordination with SRLM will help in ensuring efficient implementation of group related component of PM FME scheme*. Following will be the major areas for convergence with SRLMs.

Convergence with DAY-NRLM

[21] https://nrlm.gov.in/outerReportAction.do



1. **Identification of groups involved in food processing:** As mentioned earlier, Some SHGs or federation are involved in economic activities which are resulting in income enhancement for associated members. First priority will to identify those groups or federation which are involved in processing activities. It is possible that group members at individual level are also involved in processing activities. Such groups, federation, individual members involved in the processing activities will be identifies and mapping will be done as per the ODOP product.

2. **Assessment of identified groups:** A diagnostic analysis can be carried for identified groups to assess them on various parameters. These parameters can be designed around the level of business activities, technical capability, potential for scale up, ecosystem support etc. Groups scoring high in the study can be prioritized for providing help under PM FME scheme. It can be done by establishing close coordination with DAY-NRLM and this exercise can help in selecting the most appropriate groups for the intervention under PM FME scheme.

3. **Facilitating the access to credit from financial institutions:** Credit linkages of the groups is one of the important components under financial inclusion vertical of DAY-NRLM. Financial inclusion team of worked in close collaboration with formal financial institutions for facilitating the access to credit for groups. Their expertise and coordination can help a great deal in ensuring the delivery of credit to groups identified for providing support under PM FME scheme. Systemics flow of credit from formal financial institutions will act as catalyst for scaling up of processing business activities by the involved groups.

4. **Training, capacity building and handholding support:** Groups targeted under the PM FME scheme needs to be supported on various steps in order to ensure the successful scale up of business activities. Support on marketing, business operation needs to be provided along with sustained focus on training and capacity building of members involved. Collaboration with SRLM will play a pivotal role in providing training, capacity building and handholding support to the groups.

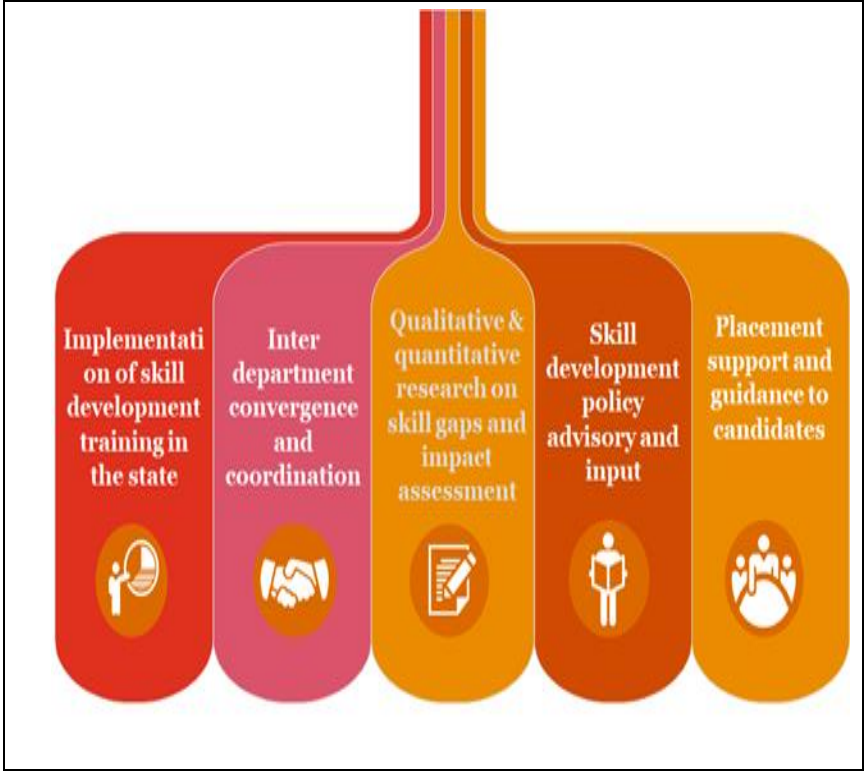
3.2.3. Punjab Skill Development Mission

Overview and Functions of the Mission

Punjab skill development mission(PSDM) was set up by the government of Punjab under the society registration act. The mission is mandated to act as single point contact in government structure for the purpose of formulating and implementation of various skill development scheme in the state of Punjab. PSDM endeavors to collaborate with various state government department for promoting the development of skill among youth of the state. Multiple schemes related to skill development are being run by the central government and various state government department. PSDM coordinate the implementation of various skill development program and bring a necessary element of synergy for achieving the overall objective of skill development.

The mission undertakes various kinds of function ranging from implementation to policy advisory and adopt an integrated approach for skill development in the state of Punjab. It provides training to youth under various state and centrally sponsored schemes. These trainings are provided through empaneled training partners in different sectors. Food processing is also one of the sectors under which training is provided through various scheme. PSDM engages with other government department in order to provide strategic and implementation support for increasing the outreach of various skill development program. The mission undertakes various kinds of qualitative and quantitative research on skill gaps and carry out impact evaluation of skill development programs. PSDM also leverage its extensive network for providing support to candidates on placement and other career related guidance.

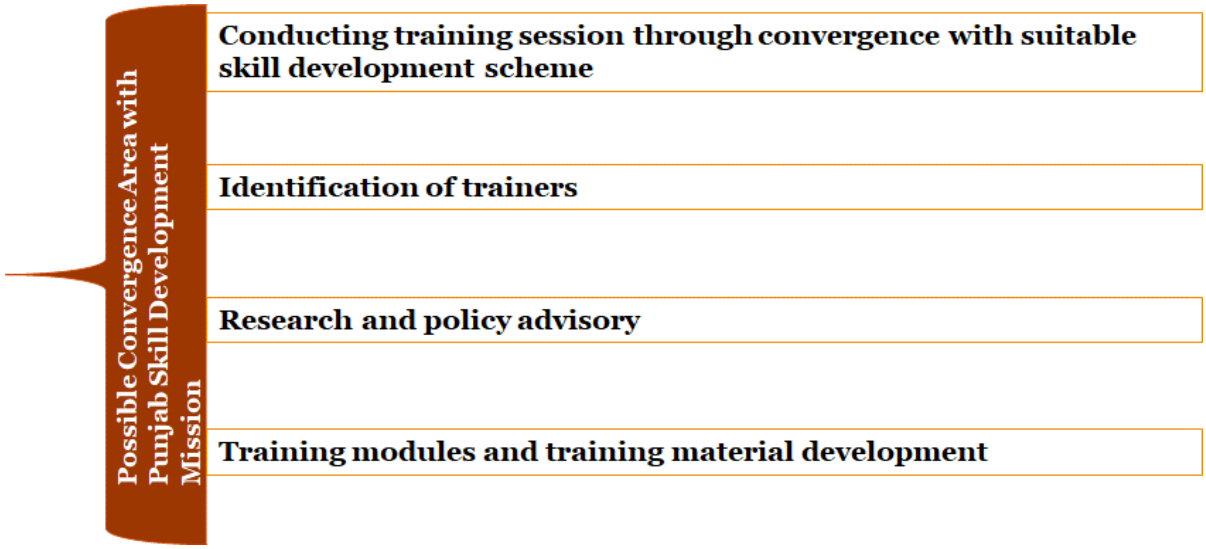
Major functions of PSDM



Rational and Opportunities for Convergence with Skill Development Mission

There is a need to build the capacity of human resource working in the unorganized micro food sector for catapulting the sector toward formalization. It is imperative for increasing the scale of business and enable the micro units to overcome various challenges and constraints. A separate ministry named ministry of skill development and entrepreneurship has been created by the central government for archiving the objective of equipping the youth with necessary skills. A number od schemes are being run and Punjab skill development mission is the nodal agency for handling skill development ecosystem in the state of Punjab. Following can be the major areas of convergence in this regard.

Convergence with PSDM



1. **Conducting training session through convergence with suitable skill development scheme:** PSDM is the nodal agency for steering skill development schemes in the state of Punjab. Food processing is also one of the sectors in which training is provided through various skill development

scheme. Leveraging these schemes for imparting training can help in creating a pool of skilled manpower to serve the need of the unorganized sector in ten state.

2. **Identification of trainers:** PSDM has been working with multiple stakeholders and developed a strong network in the field of skill development. This network can be leveraged for the identification of trainers who will impart the training under PM FME scheme at grass roots level. These trainers can be utilized for providing need-based training to beneficiary on different components under the PM FME scheme.

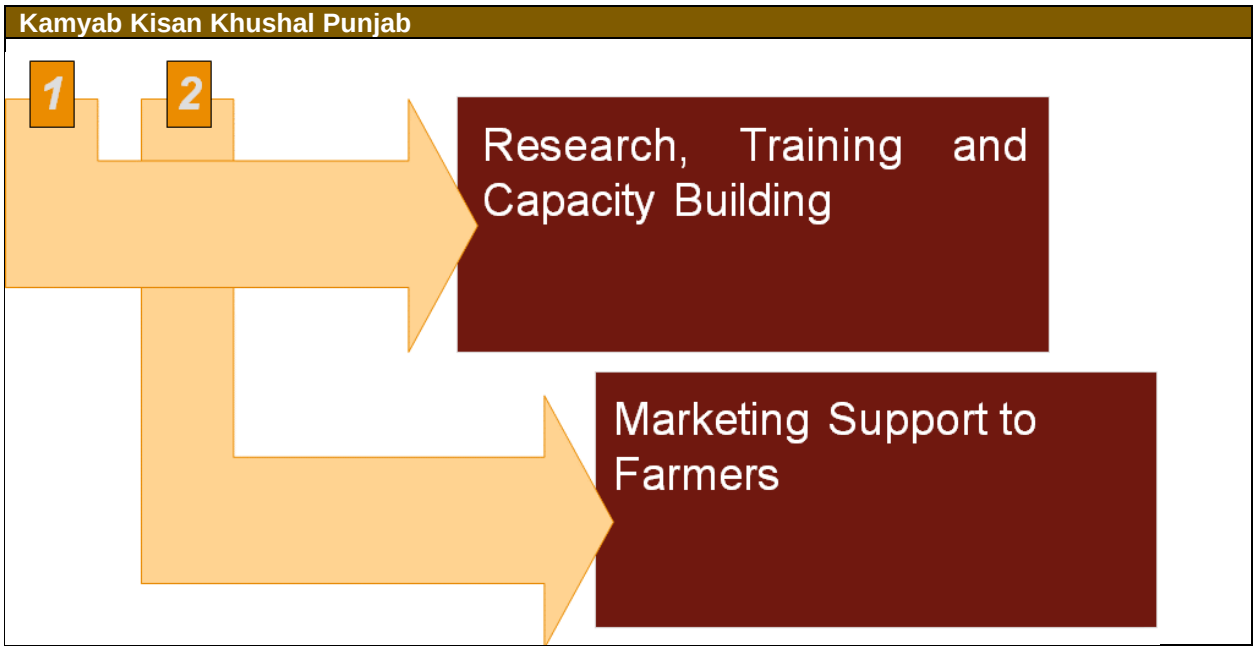
3. **Research and policy advisory:** One of the main functions of the PSDM is to conduct qualitative and quantitate along with providing policy advisory. This expertise can be utilized in the PM FME scheme to identify the gaps in skill development and deciding in course of action to fill the gaps. At the initial level, assessment can be carried out to current status of skills and knowledge possessed by those working in unorganized food processing sector. This assessment will help in prioritizing the areas for capacity building.

4. **Training modules and training material development:** Training modules and curricula for providing training and capacity building support under the PM FME scheme will be developed by National Institute for Food Technology Entrepreneurship and Management(NIFTEM) and Indian Institute of Food Processing Technology (IIFPT). Expertise of PSDM can be utilized for further refinement as per local dynamics.

3.2.4. State funded agriculture schemes

3.2.4.1. Kamyab Kisan Khushal Punjab:

This is the latest scheme launched by the government of Punjab in budget 2021-22. It is aimed at sustainable development of agriculture in the state through making efforts on marketing and research & development front. The total budget expenditure to be made under the scheme is 3780 crores for implementation during three years. The scheme aims to work on various dimension of the agriculture including providing livelihood, food and nutritional security to farmers as well as making the state's agriculture sustainable. Major provision of the scheme can be categorized into following two components.



Research, Training and Capacity Building: Multiple initiatives are planned under the scheme to promote research along with training and capacity building of farmers under the scheme. A centre for excellence for vegetables is planned to be set up at Fazilika district at a cost of Rs 10 cr. Other than this, 25 horticulture estates

will be set up in Punjab with a target of setting one estate in each district. These estate will expose farmers to modern technology and explain the technical know-how under one roof. A post graduate institute of horticulture research and education(PGIHRE) is planned to be established under the scheme.

Marketing Support to Farmers: The scheme aims to encourage farmers to self-market their produce which can result in enhanced income for their produce. Under the scheme, mobile vending e-carts will be provided to the farmers at subsidized rate to help them in self-marketing of their produce.

3.2.4.2. Pani Bachao Paisa Kamao Scheme

This scheme was launched by the government of Punjab in June 2018 to check the depleting ground water level in Punjab. It was launched on pilot basis as problem of ground water depletion is turning out to be significant challenge for the state agriculture. Overdependence on paddy wheat cycle has played a key role in the depletion of ground water level as paddy is water gulping crop and most of the irrigation is done through the tubewell. This scheme offers various types of financial incentives to the farmers for saving water through low usage of free power supply for the tubewell. Following are the major provision of the scheme.

- A meter will be installed for any farmers who is willing to get enrolled under the scheme. This meter will be installed on the tubewell system and it will record the amount of waters farmers are saving.
- The state has the provision of supplying two hours of extra power supply to those farmers who will enroll under this water saving scheme.
- The farmers will receive Rs. 4 for every unit of electricity that they save. The money will be transferred by the state government into the bank account of agricultural workers.

3.3. Benchmarking of policies/schemes

We have compared food processing policy of five different states namely; Gujarat, Karnataka, Maharashtra, Chhattisgarh and Punjab. Food Processing Policies in terms of capital subsidy as well as fiscal incentives are compared. Detailed comparison table is given below;

S.No.	Scheme	Punjab Industrial Policy 2017			Gujarat Agro Business Policy 2016-21	Karnataka Agro Business Policy 2016-21		MH State Industrial Policy 2017	Chhattisgarh Industrial Policy 2014-2019			
		Eligibility			Eligibility	Eligibility		Eligibility	Eligibility			
		MSME	Large	Mega		FOR MSME	FOR A,B,C ENTERPRISES		Developing Areas		Backward Areas	
									MSME	Medium And Large	MSME	Medium And Large
1	New Food Processing Units					35% of eligible cost; max. Rs. 65 lakh; Interest subsidy of 6% per annum for 7 years		10% of project cost in addition to central funding, 5% interest subsidy for 5yrs	35% & 40% of project cost, Max limit Rs. 60 and Rs. 80 Lakh for general and SC category respectively	35% of project cost up to Rs. 70 and Rs. 110 lakh for general and RS. 100 and Rs. 120 for SC category	35% & 40% of project cost, Max limit is Rs. 80 and Rs. 120 Lakh for general and SC category respectively	45% of project cost up to Rs. 100 and Rs. 120 lakh for general and RS. 125 and Rs. 140 for SC category
2	Technology Upgradation/Modernization of existing FP units							5% of project cost;max.Rs. 25lakh				

3	SC/ST Women Enterprise								10% additional subsidy			
4	Reefer Vehicles				25% of eligible cost; Rs.50 lakh. 7.5% on term loan with a max.amount of Rs.400 lakh for 5 years							
5	Scheme for setting up/Upgrading Testing Labs(including NABL)					50% of cost; Max. Rs.1lakh						
6	Power reimbursement	100% exemption for 7 years with fixed tariff of Rs. 5 per KVAH for 5 years	100% exemption for 10 years with fixed tariff of Rs. 5 per KVAH for 5 years	100% exemption for 10 years with fixed tariff of Rs. 5 per KVAH for 5 years	Rs.1 per unit for 5 years	100% exemption for 8 years		New Units in Group C, D, and D+ areas and No-Industry District(s) , Naxalism affected Area will be exempted during eligibility period not exceeding 15 years .	Full exemption up to 7 and 10 years from COD for General and SC category respectively	Full exemption up to 10 and 12 years from COD for General and SC category respectively	Full exemption up to 7 and 10 years from COD for General and SC category respectively	Full exemption up to 10 and 12 years from COD for General and SC category respectively
7	NALA charges					100% reimbursement	100% reimbursement					
8	Stamp duty/transfer duty	100% exemption	100% exemption	100% exemption	50% reimbursement on sale/lease/transfer of land; 100% reimburseme	100% reimbursement	100% reimbursement	For BT,IT manufacturing units, reimbursement of 100% and 75% for public parks				

					nt for setting up infrastructure projects			and private parks respectively. For Mega Projects - 50% for first conveyance deed only				
9	VAT/CST/GST	Reimbursement of 100% for 7 years from COD with a cap of 100% FCI	Reimbursement of 100% for 10 years from COD with a cap of 125% FCI	Reimbursement of 100% for 10 years from COD with a cap of 125% FCI	limited to 70% of eligible fixed capital; Reimbursement will be available for 5 years	75% for 5 years ;subject to a max. of 100% of value of fixed assets	50%; subject to a max. of 100% of value of fixed assets					
10	Scheme for Financial Assistance for Freight Subsidy				25% of actual air freight paid; Rs.10 lakh for export of any fresh or processed horticulture milk, poultry or fish produce.							
					40% of actual air freight paid; Rs.15 lakh per year per unit for 5 years for organic produce.							
					25% of actual sea freight paid;limited to Rs.2 lakh per annum and max.limit per							

					beneficiary will be Rs.5lakh for export of samples to foreign countries							
11	Skill enhancement				50% of fee paid; Rs.10000 per employee ; Assistance under this incentive will be subject to an overall ceiling of Rs.0.5lakh per unit max. for a period of 3 years							
12	Quality Certification Mark	100% subject to maximum of Rs.10 lakhs			50% assistance of expenditure; Rs.5 lakh				50% & 60% of the amount paid, Max limit Rs. 1.0 and Rs. 1.25 Lakh for general and SC category respectively	50% & 60% of the amount paid, Max limit Rs. 1.0 and Rs. 1.25 Lakh for general and SC category respectively	50% & 60% of the amount paid, Max limit Rs. 1.0 and Rs. 1.25 Lakh for general and SC category respectively	50% & 60% of the amount paid, Max limit Rs. 1.0 and Rs. 1.25 Lakh for general and SC category respectively
13	Interest subvention	3years from COD@ 5% up to 10 Lakhs for border										

		districts, Khandi area & SC/women entrepreneurs										
23	Exemption from entry tax					100% exemption for 3 years on plant and machinery and capital goods	for A,B enterprise100 % exemption for an initial period of 3 years; for C enterprise 100% exemption for an initial period of 5 years on plant and machinery on capital goods					
24	Setting up an Effluent Treatment plant	50% financial support up to max of Rs. 25 lakhs on capital cost for setting up of ETP				75%; max Rs.50 lakh	50% of the cost; Subject to a ceiling of Rs.100lakh					
25	Market fee exemption	100% reimbursement up to 7 years	100% reimbursement up to 10 years	100% reimbursement up to 10 years		New Food Industries are exempted from paying market fee for 10 years	New Food Industries are exempted from paying market fee for 10 years					
26	Exemption from CLU/EDC charges	50% exemption	100% exemption	100% exemption								

27	Exemption of land premium in Industrial parks								50% and 100% of exemption for General and SC category respectively	50% (Medium) and 20% (large) for general category and 100% for SC category	60% and 100% of exemption for General and SC category respectively	60% (Medium) and 25% (large) for general category and 100% for SC category
28	NRIs, Foreign direct investors (FDI)								5% additional subsidy			

3.4. Opportunities for convergence

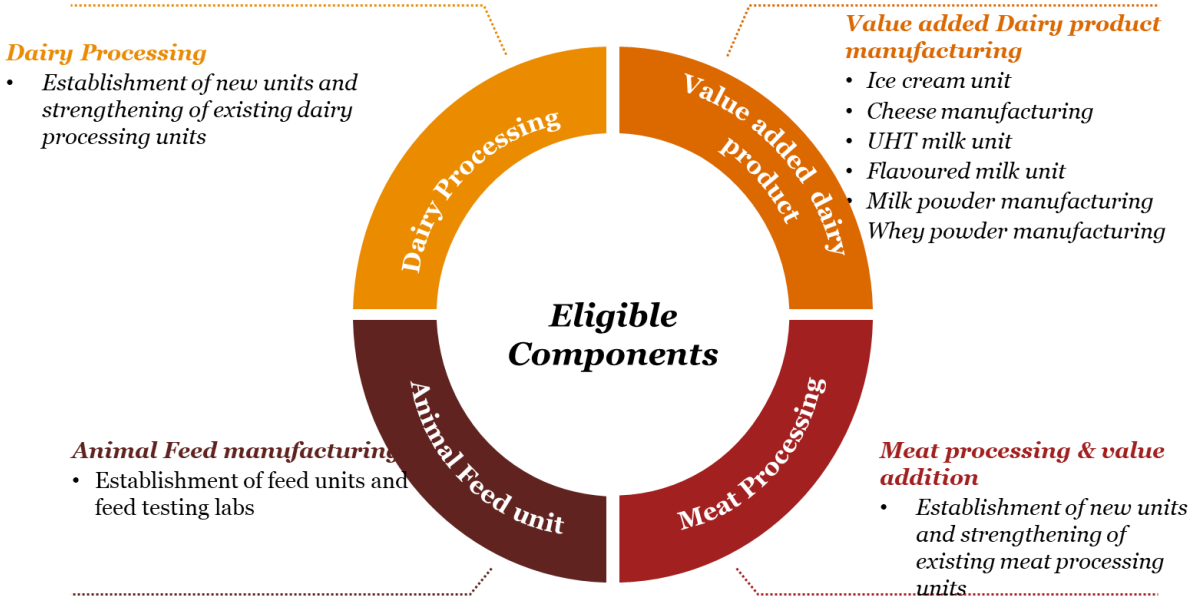
Mission on Integrated Horticulture Development

Mission for Integrated Development of Horticulture (MIDH), a Centrally Sponsored Scheme is implemented to holistic growth of the horticulture sector covering fruits, vegetables, root and tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew and cocoa. Mission subsumes National Horticulture Mission (NHM), Horticulture Mission for North East & Himalayan States (HMNEH), National Horticulture Board (NHB), Coconut Development Board (CDB) and Central Institute for Horticulture (CIH), Nagaland. All States/UTs are covered under MIDH.

MIDH promotes post-harvest management through cold storage, cold chain supply including pack houses, ripening chamber, reefer vehicle, etc. In addition, the scheme also promotes primary and minimal processing of horticultural produce. Pattern of assistance available under MIDH has been detailed out in the annexure. As PM FME scheme has focus to support perishables and there is ample scope for investment in post- harvest infrastructure and minimal processing centres for the selected ODOP in the state, convergence with MIDH will be an added advantage.

Animal Husbandry Infrastructure Development Fund (AHIDF)

AHIDF is one of the initiatives taken under Atmanirbhar Bharat Abhiyan stimulus package for holistic development of animal husbandry sector. The fund allocated under the scheme is INR 15,000 crores. The scheme envisages to incentivize dairy processing and value addition infrastructure, meat processing and value addition infrastructure and animal feed plant. The main objective of the scheme is to increase production, value addition and price realization at the farmer level. The scheme will provide interest subvention of 3% for all eligible entities. Eligible entities can avail loan up to 90% of the project cost. This scheme give boost to the sector and reduce post-harvest losses due to absence of value addition infrastructure. Animal feed units will ensure quality of produce.



Pattern of assistance is given in the table below:

Sl. No.	Name of Component	Norms
1	Interest Subvention Cost	All loans under this financing facility will have interest subvention of 3% per annum. Eligible entities can avail loan up to 90% of the project cost.
2	Credit Guarantee Cost	Credit guarantee coverage will be available for eligible borrowers from this financing facility under Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) scheme for a loan up to Rs. 2 crores. The fee for this coverage will be paid by the Government.

Pattern of Assistance under CGTMSE Scheme

Category	Maximum extent of Guarantee where credit facility is		
	Upto 5 Lakh	Above 5 lakh upto 50 lakh	Above 50 lakh upto 200 lakh
Micro Enterprises	85% of the amount in default subject to a maximum of 4.25 lakh	75% of the amount in default subject to a maximum of 37.50 lakh	75% of the amount in default subject to a maximum of 150 lakh
Women entrepreneurs/ Units located in North East Region (incl. Sikkim) (other than credit facility upto 5 lakh to micro enterprises)	80% of the amount in default subject to a maximum of 40 lakh		
All other category of borrowers	75% of the amount in default subject to a maximum of 37.50 lakh		
Activity	**From 10 lakh upto 100 lakh**		
MSE Retail Trade	50% of the amount in default subject to a maximum of 50 lakh		

Application Process:

- Borrower will fill all the details in the credit guarantee form (https://www.cgtmse.in/) and submit the same to the term loan lending bank.
- Then the term loan lending banker will upload the details of concerned borrower to the CGTMSE portal.
- The borrower details will be thoroughly scrutinized by the concerned department of CGTMSE.
- Based on eligibility of borrower credit guarantee will be provided.

As the PM FME scheme is providing capital incentive to the micro entrepreneurs for setting up food processing units. There is a scope of dovetailing with entrepreneurs venturing into dairy processing/meat processing/animal feed units taking interest subvention from AHIDF scheme on the term loan availed by the banks. This will lower the burden of the entrepreneurs in terms of loan repayment is concerned and would ease in availing loan.

The entrepreneurs/investors can apply on the AHIDF portal for availing interest subvention, the application goes to the Ministry and based on the proposals, application is scrutinized and approved by the project sanctioning committee. Application will comprise of Detailed Project Report. with requisite details about the project. It may be

noted that the loan availed for purchase of land, working capital, old machineries and personal vehicles are not eligible. In addition to the interest subvention credit guarantee will be made available by NABARD.

Agriculture Infrastructure Development Fund

To mobilize a medium - long term debt finances facility for investment in viable projects for post-harvest management Infrastructure and community farming assets through incentives and financial support in order to improve agriculture infrastructure in the country. This financing facility will have numerous objectives for all the stakeholders in the agriculture eco-system.

The Scheme will be operational from 2020-21 to 2029-30. Disbursement in four years starting with sanction of Rs. 10,000 crore in the first year and Rs. 30,000 crore each in next three financial years. Moratorium for repayment under this financing facility may vary subject to minimum of 6 months and maximum of 2 years.

All loans under this financing facility will have interest subvention of 3% per annum up to a limit of Rs. 2 crore. This subvention will be available for a maximum period of 7 years. In case of loans beyond Rs.2 crore, then interest subvention will be limited up to 2 crores.

Credit guarantee coverage will be available for eligible borrowers from this financing facility under Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) scheme for a loan up to Rs. 2 crores.

As the PM FME scheme is providing capital incentive to the micro entrepreneurs for setting up food processing units. There is a scope of dovetailing with entrepreneurs planning to set up post-harvest infrastructure taking interest subvention from AIDF scheme on the term loan availed by the banks. This will lower the burden of the entrepreneurs in terms of loan repayment is concerned and would ease in availing loan.

The entrepreneurs/investors can apply on the AIDF portal (http://agriinfra.dac.gov.in/) for availing interest subvention, the application goes to the Ministry and based on the proposals, application is scrutinized and approved by the project sanctioning committee. Application will comprise of Detailed Project Report. with requisite details about the project. It may be noted that the loan availed for purchase of land, working capital, old machineries and personal vehicles are not eligible. In addition to the interest subvention credit guarantee will be made available by NABARD.

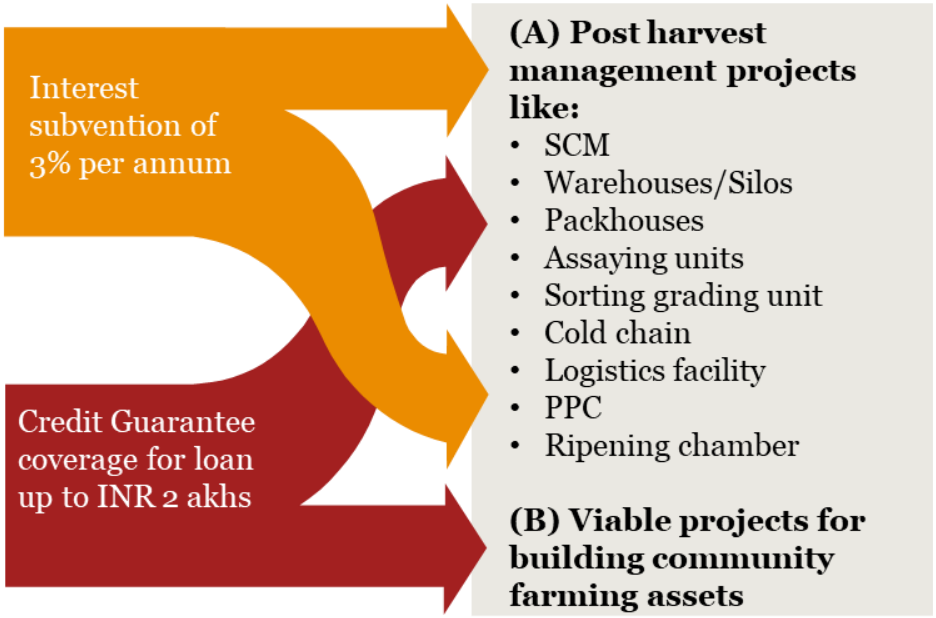


Figure 7: Salient features of Agri Infrastructure Fund

Scheme of Fund for Regeneration of Traditional Industries (SFURTI)

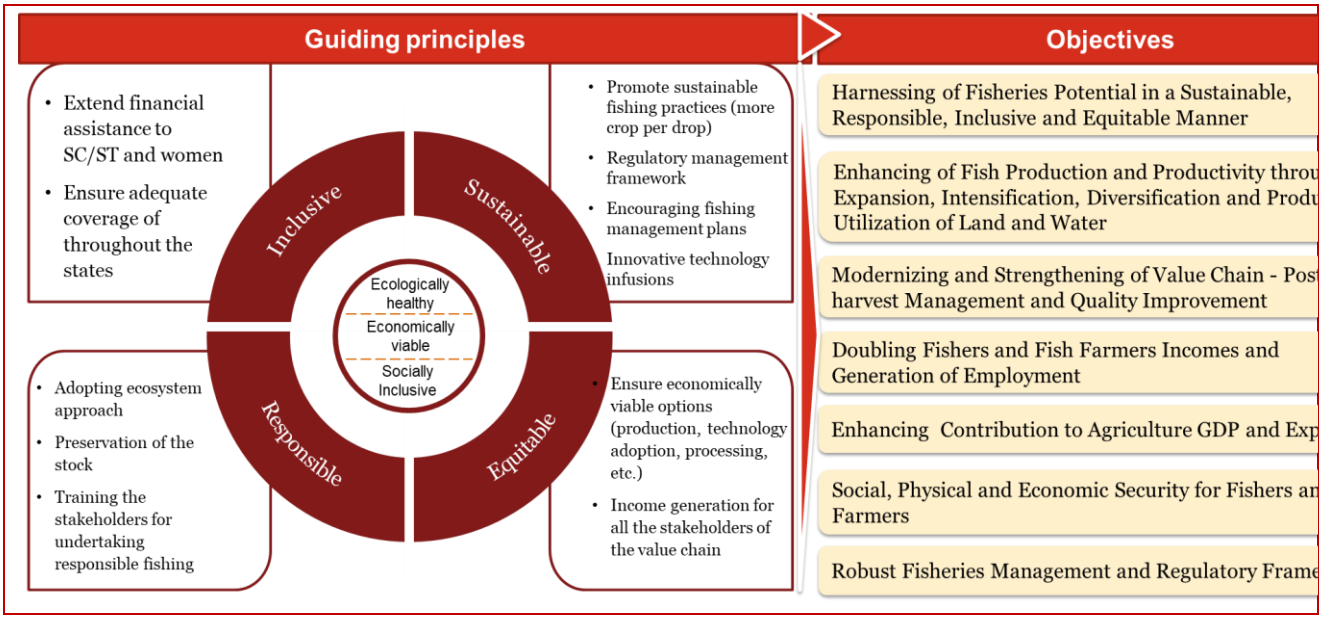
The objectives of the scheme is to organize the traditional industries and artisans into clusters to make them competitive and provide support for their long term sustainability, sustained employment, to enhance marketability of products of such clusters, to equip traditional artisans of the associated clusters with the improved skills, to make provision for common facilities and improved tools and equipment for artisan,to strengthen the cluster governance systems with the active participation of the stakeholders, and to build up innovated and traditional skills, improved technologies, advanced processes, market intelligence and new models of public-private partnerships, so as to gradually replicate similar models of cluster-based regenerated traditional industries.

The financial assistance provided for any specific project shall be subject to a maximum of Rs 8 (eight) crore to support Soft, Hard and Thematic intervention.

PAIC can work in convergence with MSME department can work towards similar cluster for effective implementation of the PM FME scheme. Traditional products widely manufactured in the stale like pickle, jaggery based products, wadiya papad, honey etc. has wide scope forconvergence.

Pradhan Mantri Matsya Sampada Yojana

PMMSY, an umbrella scheme for sustainable and responsible development of fisheries sector in India has been launched in May 2020. Apart from the targets envisioned under this scheme, the guiding principles of sustainable, inclusive, responsible and equitable interventions are the key to the new approach of this pathbreaking programme.



It encompasses interventions to benefit all the stakeholders across the fisheries and aquaculture value chain and enhance overall efficiencies. This ambitious initiative of GoI has a total budget outlay of INR 20,000 cr and clearly defined impact areas.

As Meat, Poultry and fisheries is one of the ODOP in the state, scope for convergence with the PMMSY in association with the Punjab State Fisheries Development Board for augmented effect of both the schemes can be explored.

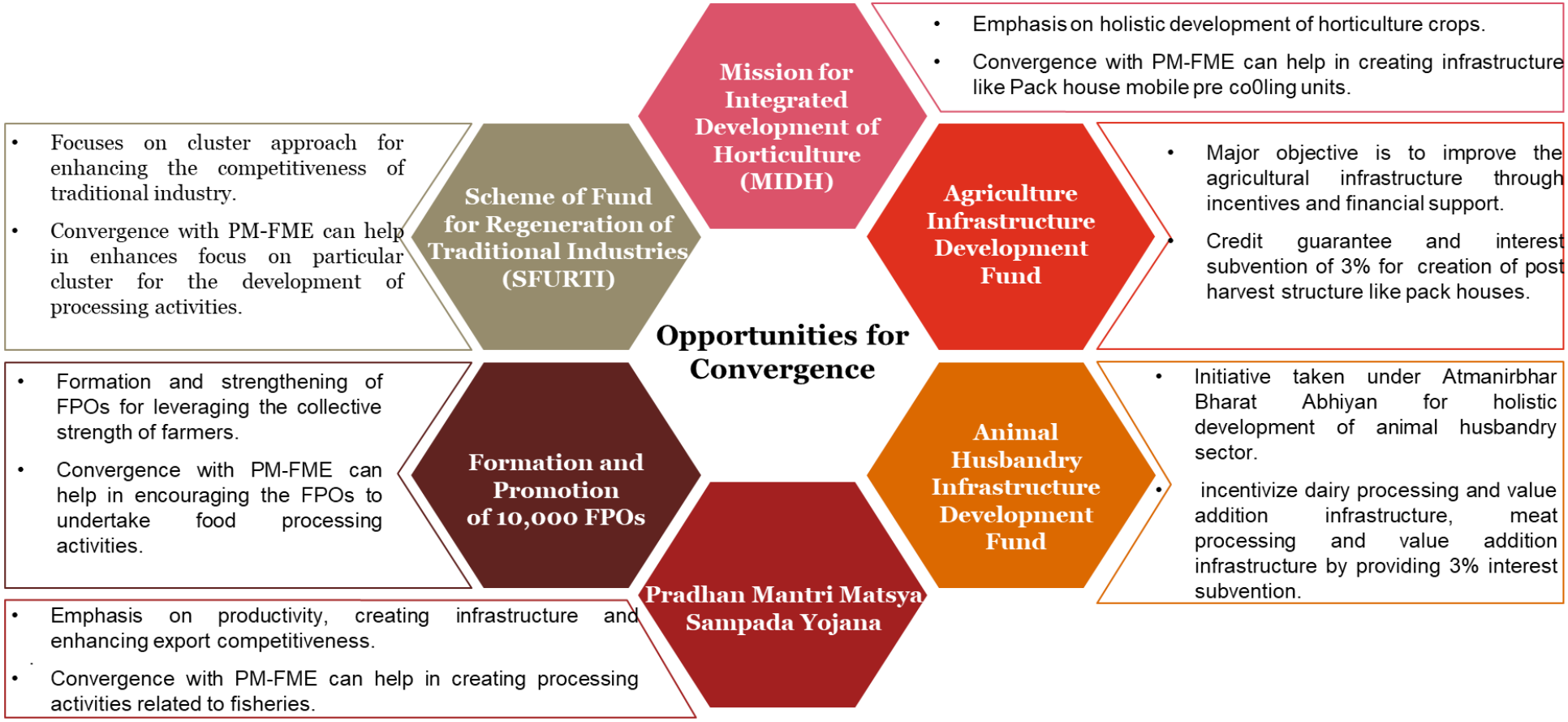


Figure 8: Opportunities of convergence with other schemes

3.5. Assessment of existing regulatory frameworks for FPI

The major acts/rules/ policies/schemes from the perspective of private investment and regulatory reforms are elucidated and major issues for private sector investment is identified in the following sections.

This section assesses the regulatory framework operational having direct or indirect impact on unorganized sector participation in the food processing.

The table covers the key Acts/Policies, programmes/schemes for private sector investment in the agribusiness sector of the state.

Table 2: Policies impacting private sector participation in Food Processing sector

Category	Sector	Acts/ Rules & Guidelines	Policy /Programs
Market	Marketing	▪ Essential Commodities Amendments Bill 2020 ▪ The Farmers Agreement of Price Assurance Farm Services Act 2020 ▪ The farmers' produce trade and commerce (promotion & facilitation) bill 2020	▪ NA
Infrastructure	Warehousing / Cold storages/Pack house/Ripening Chamber	▪ Warehouse (Development & Regulation Act) 2007 ▪ Negotiable Instruments Act 1881	▪ MIDH ▪ Agri Infrastructure Development Fund
	Food Processing Industries	▪ Food Standards & Safety Act 2006 ▪ Food Standards & Safety Rules 2011	▪ Pradhan Mantri Kissan Sampada Yojana ▪ PM FME ▪ Animal Husbandry Infrastructure Development Fund
	Industries (General)	▪ Water (prevention and Control of pollution) Act, 1974 & 1977 ▪ The Air (Prevention and Control of Pollution) Act, 1981 & 1986; ▪ Labour Act & Factories Act; ▪ Punjab Industrial Facilitation Act 2005	▪ The Punjab Industrial Policy 2017 and 2018 (amendments)

The overall private sector investment promotion for food processing sector in is addressed by one policies namely - Punjab Industrial Facilitation Act 2005 and the Punjab Industrial Policy 2017-18.

3.5.1. Essential commodities Act 1955

The Essential Commodities Act (ECA) was enacted by the Central Government in 1955 to control and regulate trade and prices of commodities declared essential under the Act. Central legislation dealing with Essential Commodities (EC Act) Act has been further liberalized to remove controls on the movement, storage and marketing of agricultural commodities including abolition of licensing system.

Table 3: Remarkable features of Essential commodities act 1955	
Applicability	Seven major commodities are covered under the act. Some of them are: **Petroleum**: petrol, diesel, kerosene, Naphtha, solvents etc. **Food stuff:** edible oil and seeds, vanaspati, pulses, sugarcane and its products like, khandsari and sugar, rice paddy **Jute and textiles** **Essential Drugs** **Fertilizers**
Salient Features	• Powers to control production, supply, distribution, etc., of essential commodities

	• Regulating by licenses, permits or otherwise the production or manufacture of any essential commodity; • Controlling the price at which essential commodity may be bought or sold; • Regulating by licenses, permits or otherwise the storage, transport, distribution, disposal, acquisition use or consumption of, any essential commodity; • Prohibiting the withholding from sale of any essential commodity ordinarily kept for sale. • Requiring any person holding in stock, or engaged in the production, or in the business of buying or selling, of any essential commodity

3.5.2. Warehouse (Development & Regulation) Act 2007

The main objectives of the Warehousing (Development and Regulation) Act, 2007 are to make provisions for the development and regulation of warehouses, negotiability of warehouse receipts, establishment of a warehousing Development and Regulatory Authority (WDRA) and related matters.

The Negotiable Warehouse Receipts (NWRs) issued by the warehouses, registered under this Act, would help the farmers to avail loan from banks against NWRs and the NWRs will become a prime tool of trade. This will avoid distress sale of agricultural produce by the farmers in the peak marketing season when there is glut in the market. It will also be beneficial to other stakeholders, such as, banks, financial Institutions, insurance companies, trade, commodity exchanges as well as consumers.

Table 4: Remarkable features of WDR Act 2007	
Applicability	Any person desirous of commencing or carrying on the business of maintaining a warehouse issuing negotiable warehouse receipts (NWR)
Salient Features	• Duties of warehousemen • Special powers of warehouseman to deal with perishable and hazardous goods • Lien of warehouseman on goods • Negotiability of warehouse receipts • Establishment of a Warehousing Development and Regulatory Authority
Current Status	***Out of 949 warehouses registered under the Act with WDRA, 14 warehouses are from Punjab out of which 8 owned by Punjab State Warehousing Corporation and 6 are owned by Central Warehousing Corporation[22].*** ***This shows that Punjab has been unable to take the benefit of NWRs, which would enable improved bank finance, quality of lending and increased liquidity in the rural areas.***

3.5.2.1. Major Issues for Private Sector

3.5.2.1.1. Insurance Requirements for Warehouses under WDRA:

As per WDRA, the warehouses need provide insurance of ***goods of 100% storage capacity*** for accreditation / registration of cold storages. Since, average capacity utilization in the year is less than be total storage capacity, cold storage owners are reluctant to take insurance policy on the basis of 100% capacity utilization. This needs to be changed to enable the warehouses to cover the physical stocks at the time on a real time data on warehouse capacity utilization, in the season.

Moreover, the act provides that warehouse receipt should have name of the insurance company indemnifying for *fire, floods, theft, burglary, misappropriation, riots, strikes or terrorism*.

To mitigate these risks, the three insurance policies viz standard fire and special perils, burglary and fidelity guarantee policies are required by the warehouse owners. These insurance policies add an expenditure on the warehouse owners.

[22] WDRA Database as on 31/07/2015;

3.5.2.1.2. Complex method & Cost of accreditation / registration rules and regulation:

The private investors have to undergo a cumbersome procedure in getting the warehouse as per State Warehousing Act as well as WRDA accredited agencies. Hence, streamlining state storage act & W (D&R) Act requirements to minimize the compliance burden and bring a more uniformed legal framework to incentivize the development of the warehousing sector.

Suitable state regulations may be enacted in order to bring it into sync with the WDRA, and this would minimize compliance burden for the warehousing entrepreneurs in the state.

Specifications such as manpower requirement as per the act does not suit small warehouses of PACS/ FPOs, which would be a major resort in states such as Punjab. These specifications may be relaxed for small warehouses of PACS and FPOs to encourage their establishment and growth.

3.5.3. Quality control in Food Processing

3.5.3.1. Food Safety and Standards Act 2006

The FSS Act was enacted by the Government of India in 2006 which was operationalized with notification of Food Safety and Standards Rules, 2011 and six regulations w.e.f 05 August 2011. The Act envisages regulation of manufacture, storage, distribution, sale and import of foods to ensure availability of wholesome and hygienic food for human consumption. The Food Safety and Standards Authority of India (FSSAI) was established in 2008 under the aegis of Ministry of Health and Family Welfare to enforce the provisions of the new law. Under the FSS Act, FSSAI is the regulatory body for all matters related to food safety and standards in the country. FSSAI & State Food Authorities are jointly responsible for implementation an enforcement of FSS Act, 2006. States/ UT Governments have appointed Commissioners of Food Safety, notified Adjudicating Officers, Designated Officers and Food Safety Officers for their respective jurisdictions to perform various functions mandated under the Act.

All food businesses in India across the food value chain are required to be licensed or registered under the provisions of the FSS Act 2006. FSSAI has laid down general and specific food safety and hygiene requirements for Food Business Operators (FBOs). Further, FSSAI requires every food business operator to have a documented Food Safety Management System (FSMS) plan, which includes sector-specific Good Hygienic Practices (GHPs) and Good Manufacturing Practices (GMPs). FSSAI has created an online Food Licensing and Registration System (FLRS) and all States/UTs (except Nagaland) are issuing Food Licenses / Registrations through online mode. Common Service Centres (CSCs) are also authorized to register food businesses, which has particularly benefitted petty food businesses.

3.5.3.2. HACCP

Hazard Analysis and Critical Control Point (HACCP) is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product. For successful implementation of a HACCP plan, management must be strongly committed to the HACCP concept. A firm commitment to HACCP by top management provides company employees with a sense of the importance of producing safe food.

HACCP is designed for use in all segments of the food industry from growing, harvesting, processing, manufacturing, distributing, and merchandising to preparing food for consumption. Prerequisite programmes, such as current Good Manufacturing Practices (cGMPs), are an essential foundation for the development and implementation of successful HACCP plans.

3.5.3.3. ISSO 22000 Food Safety Management Systems

ISSO 22000 is an international standard that specifies the requirement for a food-safety management system and combines the following generally recognized key elements to ensure food safety along the food chain to the point of final consumption interactive communication, system management, prerequisite programmes, and

HACCP principles. It delivers a common global framework of safety requirements for all organizations in the food supply chain, including crop production, processing, distribution and related operations. This food safety management system harmonises various exiting national and industry certification schemes. The food industry can implement this food management system to export their products successfully.

3.5.3.4. International Food Standards

The Codex Alimentarius of “Food Code” is a collection of standard guidelines and codes of proactive adopted by the Codex Alimentarius Commission. Codex has worked since 1963 to create harmonised International Food Standards to protect the health of consumer all s and ensure fair trade practices. The Codex Alimentarius covers all foods, whether processed or semi-processed or raw. In addition to standard for specific foods, the Codex Alimentarius contain general standard covering matters such as food labelling, food hygiene, food additive and pesticide residue, and producers’ for assessing the safety of foods derived from modern biotechnology

4. District profile

4.1. Gurdaspur

4.1.1. Socio economic profile

Gurdaspur district is one of the northern most part of the Punjab state. The district is bounded by river Ravi and Beas. It has a unique characteristic of sharing the international boundary with Pakistan and river Ravi is separating the district from Pakistan. Physio graphically the area is divided into three units (i) Siwalik Hills lying in north eastern part of the district (ii) Kandi Zone lying immediately south west of foothill zone of Siwalik hills (iii) Alluvial plains lying South West of Kandi.

Gurdaspur was founded by Mahant Guriya Das Ji in the beginning of 17th century. On his name, this city was named as Gurdaspur. He bought land for Gurdaspur from Jats of Sangi Gotra the mughal emperor Akbar is said to have been enthroned in a garden near Kalanaur, a historically important town in the district.

Gurdaspur is the district headquarter and the district is divided into five tehsils namely; **Gurdaspur, Batala, Dera Baba Nanak, Dinanagar and Kalanaur.** The District is further divided into sub-tehsils namely **Kahuwan, Kalanaur, Dinanagar, Naushehra Majha Singh, Dhariwal, Shiri Hargobindpur, Quadian & Fatehgarh Churrian**. Sub tehsils are further sub-divided into 11 blocks namely **Kalanaur, Fatehgarh Churrian, Batala, Shiri Hargobi ndpur, Dinanagar, Kuhnuwan, Dhariwal, Gurdaspur, Quadian, Dera Baba Nank & Dorangla.**

Gurdaspur district has lowest Gross District Domestic Product (GDDP) and per capita income in the state. Restrictions on economic activities and border tensions have constrained growth of the districts. Agriculture is the mainstay of the district's economy as 78% of the population is directly or indirectly dependent on it[23].

4.1.2. Demographic profile

As of 2011 it is the third most populous district of Punjab , after Ludhiana and Amritsar. Batala is the largest city in the district which hold 31% of the district population.

According to the 2011 census Gurdaspur district has a population of 22,99,026. The district has a population density of 649 inhabitants per Sq Km. Its population growth rate over the decade 2001-11 was 9.3%. Gurdaspur has a sex ratio of 895 females per 1000 males and a literacy rate of 81.1%[24].

4.1.3. Climate and Rainfall

The climate of the district is tropical type with four well defined seasons. The maximum temperature is 41^0 and minimum is 6^0 C. The normal annual rainfall of the area is 1113 mm which is unevenly distributed over Gurdaspur district. The south western monsoon (July to Sept) contributes about 80% of the rainfall and rest 20% occur during the non- monsoon period.

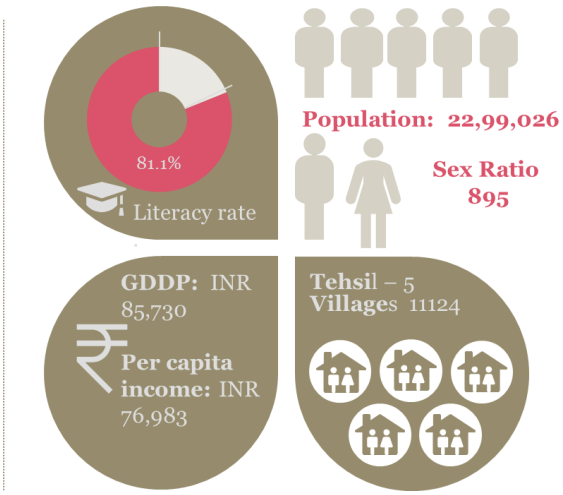


Figure 9: Socio economic profile of Gurdaspur district

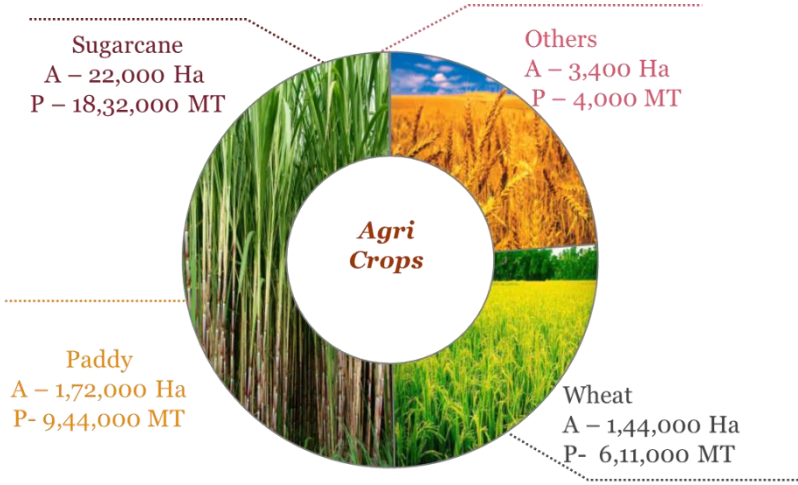
Source: Census 2011

[23] Department of Agriculture, Government of Punjab
[24] Census 2011

4.1.4. Agriculture profile

Agriculture is the main occupation of the district, having three different type of agro-climatic conditions and different soil types suitable for various type of cereals, fruits and vegetables. Major field crops grown in the district are Wheat, Paddy and Sugarcane.

During last three years the area under these crops has been more or less consistent at 1,84,000 Hectare (8,68,000 MT) and 1,72,000 Hectare (9,44,000 MT) respectively. Sugarcane is the third major crop and the area under this crop is also consistent at 22,000 Hectare (18,32,000 MT)[25].
In fact, district Gurdaspur is the second highest producer of sugarcane after district Hoshiarpur. It also grows maize, mash (pulses), sarson, sesamum and massar in marginal quantities.

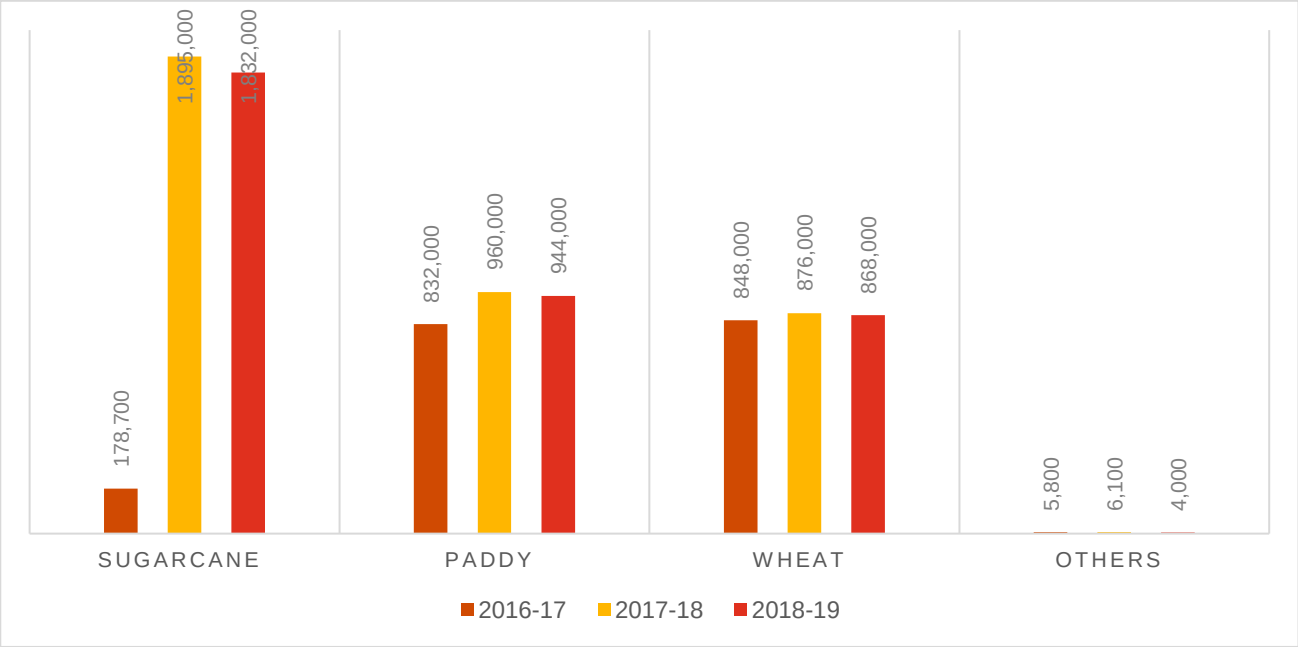


Graph 5: Major Field crops grown in the district (2018-19)

Source: Department of Agriculture, Govt. of Punjab

Production trend – Field crops

Production of sugarcane has increased manifolds since 2016-17 in the district. Production of paddy and wheat has shown almost consistent trend.



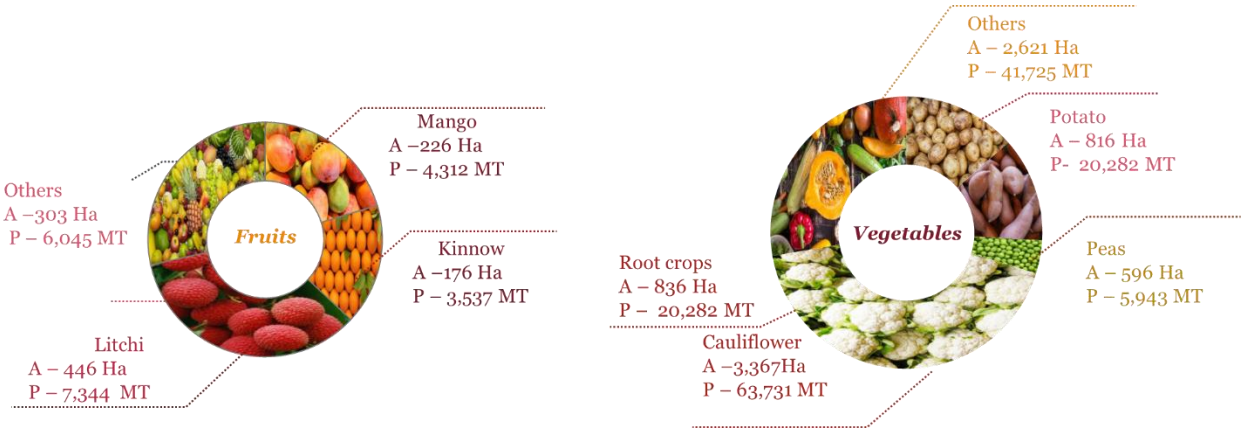
Graph 6: Production Trend of Agricultural crops (MTs)

Source: Department of Agriculture, Govt. of Punjab

4.1.5. Horticulture profile

Topography of the district is suitable for the productions of various fruits like citrus, sub-tropical fruits, nuts & dry fruits and other temperate fruits. Major fruits grown are Mango, Kinnow and Litchi . Besides these potato, and wide variety of vegetables like Peas, Cauliflower, Root Crops are widely grown in the district.

[25] Department of Agriculture, Government of Punjab

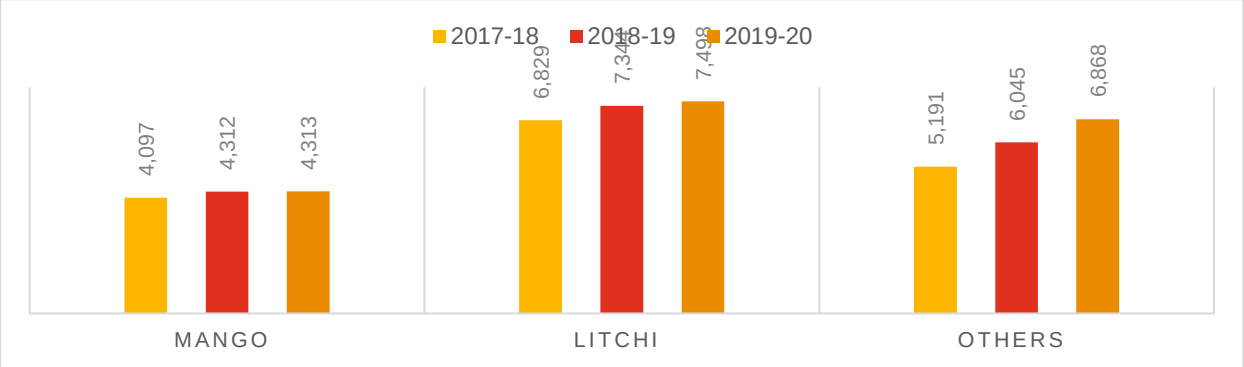


Graph 7: Major fruits and vegetables grown in the Gurdaspur district (2019-20)

Source: Department of Horticulture, Govt. of Punjab

Production Trends-Fruits

From the graph it is evident that production of fruit crops has constantly increased year after year. Total fruit crops production increased from 19,423 MT in 2017-18 to 22,278 MT in 2019-20[26]. Gurdaspur is one of the identified clusters for Litchi by State horticulture department. With the result of horticulture department's effort production of Litchi has shown spectacular increase over last three years in the state as well as the district. Production of Mango fruits has been constant since past two years in the district. But it is to be noted that yield of Mango is highest (19.07 MT/ha) in the district in the state[27].



Graph 8: Production trend of fruits in Gurdaspur (in MT)

Source: Department of Horticulture, Govt. of Punjab

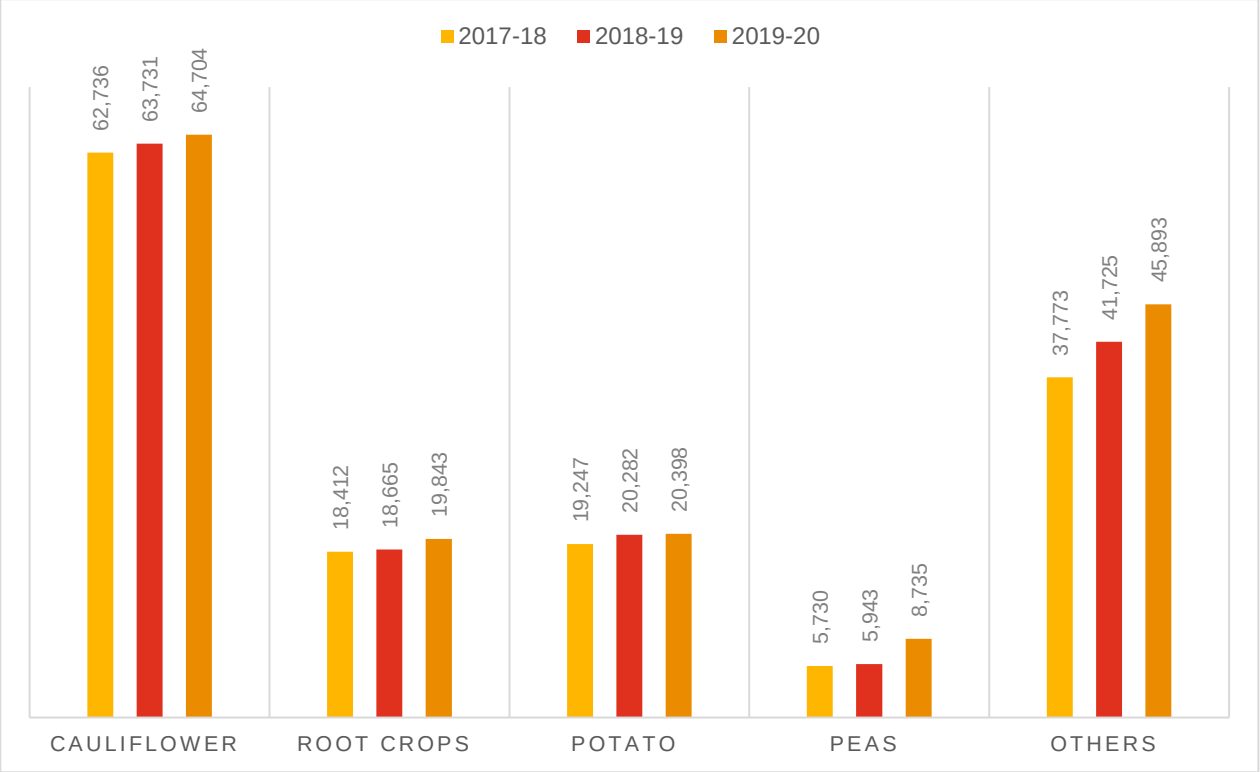
Production Trends-Vegetables

From the graph it is evident that production of vegetable crops in the district has increased year on year. Average annual growth rate of 11% was observed between 2017-18 to 2019-20. Cauliflower which contributes highest to the vegetable production in the district has also shown gradual year on year growth in the last three

[26] *Source: Department of Agriculture, Govt. of Punjab*

[27] *Source: Department of Agriculture, Govt. of Punjab*

years. Pea production has shown remarkable growth of 49% in production in 2019-20 in comparison to previous year.



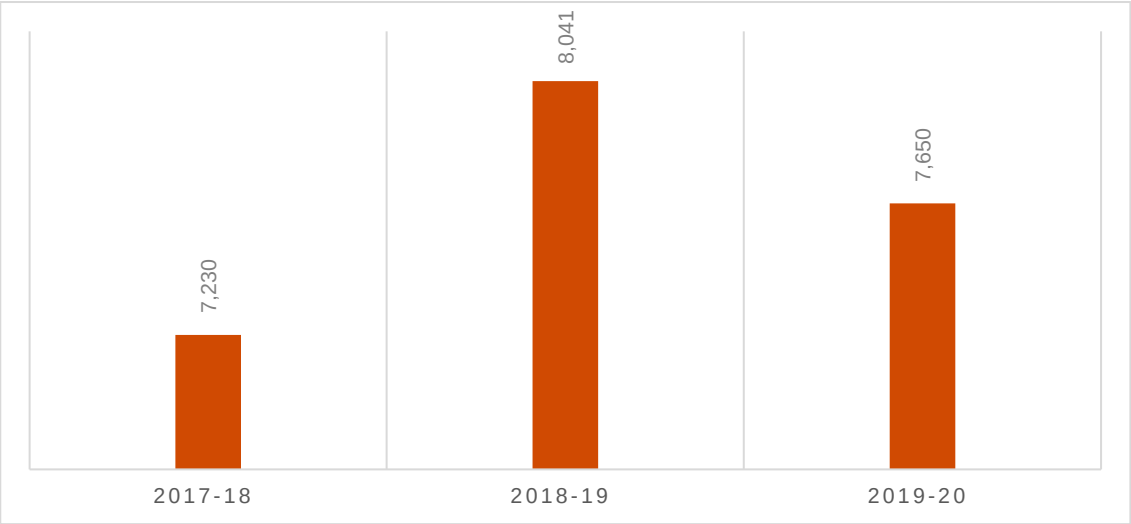
Graph 9: Production trends of vegetable crops in Gurdaspur (in MT)

Source: Department of Horticulture, Govt. of Punjab

4.1.6. Allied sector profile

Production trends-Fish

The production of fish in the district is fluctuating between 7,000 to 8,000 MT in last three years.

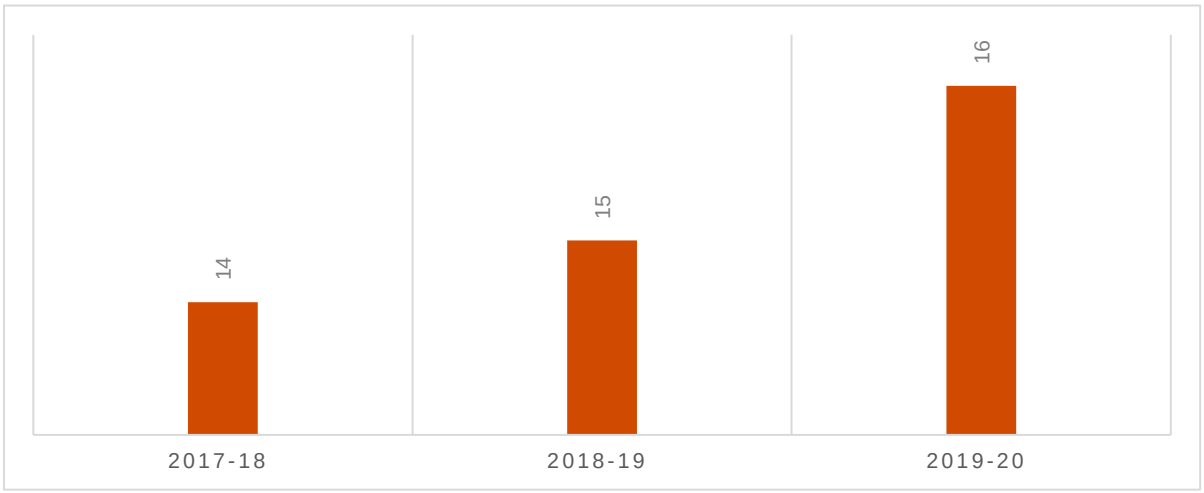


Graph 10: Production trends of Fish in Gurdaspur district

Source: Punjab State Fisheries development Board

Production Trends -Milk

The district produces over 16 lakh litre/day of milk. After adjusting the quantity for home consumption (about 55% of total production), the surplus production computes to about 6.75 lac litre[28].



Graph 11:Production trend of Milk in the Gurdaspur district (LLPD)

Source: Punjab Dairy Development Board

4.1.7. Industrial profile

There are 7804 registered Micro Small enterprises in the district and 8 registered medium and large enterprises providing employment to more than 5.55 lakhs[29]. There are 5 industrial areas in the district namely, Gurdaspur, Batala, Ghuman, F.G Churian and Sohal.

Following are the major food processing enterprises in the district;

- M/s Batala Co-operative Sugar Mills Ltd., Batala
- M/s Punjab State Co-operative Milk Products Federation Limited Cattle Feed Plant, V.P.O. Ghaniake Bangar, Tehsil Batala.
- M/s Gurdaspur Co-operative Sugar Mills Limited, G.T. Road Paniar, Gurdaspur
- M/s The Gurdaspur District Co-operative Milk Producers Union Limited, Milk Plant Gurdaspur
- M/s Kisan Dudh Udyog Limited, Vill Thriwal, Tehsil Batala, Gurdaspur

The micro food enterprises in the district are dominated by conventional small sized rice mills with average capacity of less than 2 MT/hr. conventional atta chakkis are present all across the district. About 54% of the processors are into cereal processing. About 20% of the units are into oil expelling, most of the atta chakki owners have also installed oil expellers.

About 13% of the micro food enterprises in the district are into jaggery production. Jaggery is conventionally manufactured at farm level by sugarcane growers in open pan and sold to wholesalers. Jaggery manufacturers informed us that conventionally manufactured products are in high demand in the market compared to mechanized ones. During our visit to these units, we noticed that food safety standards are not being met and adulteration is high. There are no proper sheds for manufacturing jaggery as well and no mechanism to dispose off wastewater.

Observing the potential of unorganized jaggery manufacturing facilities, Jaggery was selected as ODOP for the district.

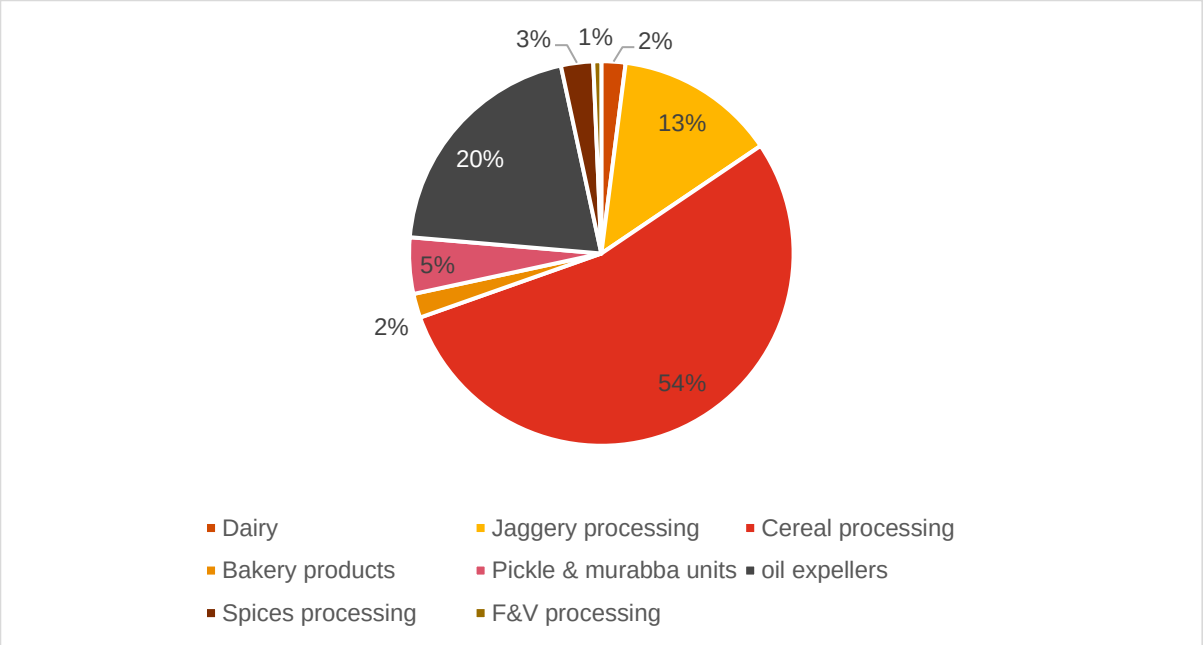
Apart from that there are SHGs and FPOs involved in pickle and murabba making, spices processing. During our visit we met Solapur Foods Farmers, who are into food processing business and has been supported by

[28] Punjab Dairy Development Board
[29] Brief Industrial Profile of District Gurdaspur, MSME Development Institute, Ministry of MSME, GOI

NABARD. They are into manufacturing of pickles, murabba and processing of spices mainly turmeric. They sell the produce under the brand name of Solapur.

In our interaction with SHGs in the district we met Mrs. Ranjit Kaur, who is into manufacturing of various products like spices, murabba, achaar, jamun poweder, amla powder. She is associated with Waheguru SHG and has 15 members associated with her. She informed that KVK Gurdaspur and PAU has been instrumental in providing training on different aspects. Major challenges highlighted by her were Marketing and branding of products, proper packaging of products to increase shelf life, lack of space for processing and storage of products, lack of technical know-how for value added products and innovative technology.

Therefore, apart from Jaggery pickle and murabba can be next potential product to support under the scheme which will augment better results.



Graph 12: Spread of micro food enterprises in Gurdaspur district:

4.1.8. ODOP

Sugarcane & allied products has been selected as ODOP of the district. The district is the second highest producer of sugarcane after Hoshiarpur in Punjab. Sugarcane is widely used in the district to manufacture Jaggery and Jaggery products. Jaggery is traditional Indian Sweetener without any chemical. Jaggery is predominantly sucrose with traces of mineral salts. It has many health benefits as compared to sugar.

There are more than 145 Sugarcane processing units in district Gurdaspur. Products manufactured are jaggery cubes, jaggery powder, jaggery toffees, jaggery mixed with sauf, dry fruits etc. Most of the micro enterprises involved in jaggery production follows conventional system of production through open pan boiling furnace, molding of jaggery in wooden panel etc. Juice extraction, filtration and boiling of juice for concentration and then cooling and solidifying to give jaggery blocks. During boiling chemical bleaching agents or natural vegetable items like Bhindi (Lady finger) are added to clean the juice and the extraneous matter is constantly removed to give a bright golden colour. Baring a couple of units, all these units needs technological up-gradation to enhance quality and shelf life of their products.

There are many exporters as well and most of the importing countries of Jaggery are USA, Canada and Middle East.

4.1.9. Non ODOP

With production base of mustard of 1330000 MT there is immense potential for mustard based oil mills and other value added products.

Milk and milk based products can be other next product which can be promoted in the district

4.2. Hoshiarpur

4.2.1. Socio economic profile

Hoshiarpur district is located in the north-east part of the State. The district is sub mountainous and stretches of river Beas in the north-west. It shares common boundaries with Kangra and Una districts of Himachal Pradesh xin the north east, Jalandhar and Kapurthala districts in south-west and Gurdaspur district in the north-west.

The districts has four divisions-Hoshiarpur, Dasliya, Mukeriyan and Garhshankar and 10 blocks namely Hoshiarpur – I, Hoshiarpur – II, Bhunga, Tanda, Dasuya, Mukerian, Talwara, Hajipur, Mahilpur and Garhshankar. Hoshiarpur was formed part of old kingdom of Katoch in Jalandhar, eventually the district was divided between Rajas of Datapur and Jaswan.

The district Gross District Domestic Product (GDDP) and per capita income is higher from the state average.

4.2.2. Demographic profile

According to the 2011 census Hoshiarpur district has a population of 15,86,625. The district has a population density of 469 inhabitants per Sq Km. Its population growth rate over the decade 2001-11 was 7.1%. The district has a sex ratio of 961 females per 1000 males and a literacy rate of 84.6%.

Out of the total population of the district 78.9 % is rural and 21.1 % is urban[30]

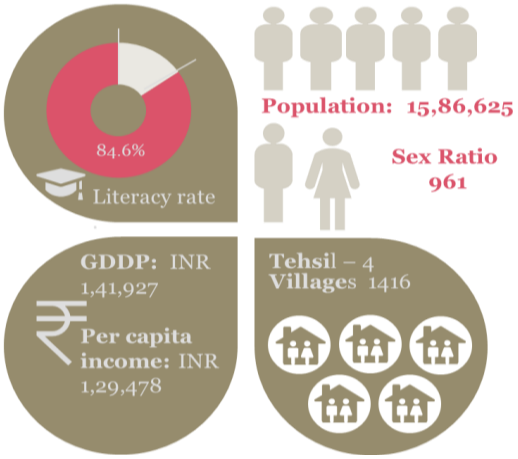


Figure 10: Socio economic profile of Hoshiarpur district

Source: Census 2011

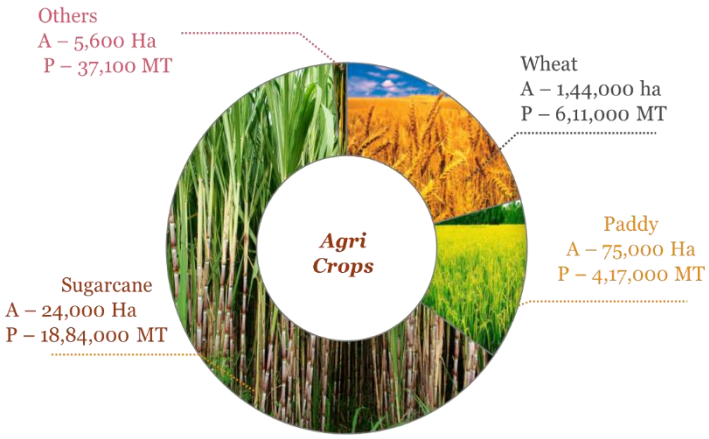
4.2.3. Climate and Rainfall

The climate of Hoshiarpur district is classified as tropical steppee, hot and semi-arid which is mainly dry with very hot summer and cold winter except during monsoon season when moist air of oceanic origin penetrates into the district. The district has mild climate compared to other districts of the State. This is due to the abundance of hilly terrain on the one hand and sizeable forest covers thereon, on the other. The maximum and minimum temperature of the district varies from 45^{0}C in summer to 5^{0}C or less in winter. The total average rainfall in district is 1125 mm.

[30] Census 2011

4.2.4. Agriculture profile

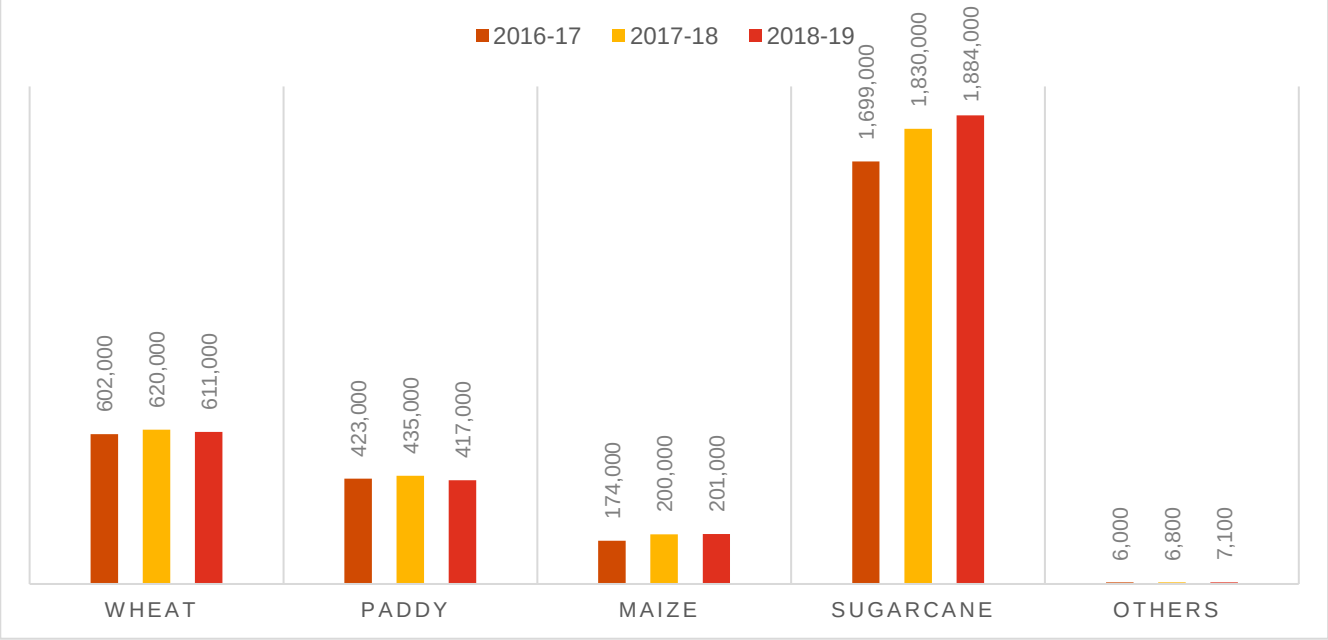
Hoshiarpur is predominantly an agriculture oriented district and majority of the population depend on agriculture for their livelihood. The soils of the district are suitable for growing different types of food crops, oilseeds, sugarcane and fruits and vegetables etc. Major field crops grown in the district are Wheat, Paddy and Sugarcane. The district is the largest producer of sugarcane in the state. Wheat and paddy are the main kharif and rabi crops of the district



Graph 13: Major agricultural crops grown in Hoshiarpur district (20218-19)

Source: Department of Agriculture, Govt. of Punjab

The area under these crops is more or less consistent at 1,44,000 Hectare (6,11,000 MT) and 75,000 Hectare (4,17,000 MT) respectively. **The district is single highest producer of maize in the state**. **During 2018-19, it produced 2,01,000 MT (54,900 Hectare) of maize, which is nearly 51% of state's production**. The area under maize is more or less consistent in last two years. However, the area under maize reported a jump of 22% from 46,000 Hectare (2016-17) to 56,000 Hectare (2017-18). **Area under sugarcane is consistently growing at about 5% each year in last. three years. During 2018-19, the area under sugarcane was 24,000 Hectare with production of 18,84,000 MT**. **Maize and Sugarcane are the stronghold of the district**. The district also grows groundnut, seaamum, sarson, taramira, gram and massar on an area of 1,300 Hectare (2,600 MT), 300 Hectare (100 MT),2,700 Hectare (3,100 MT),1,100 Hectare (1,200 MT),100 Hectare (100 MT) and100 Hectare (less than 50 MT) respectively.



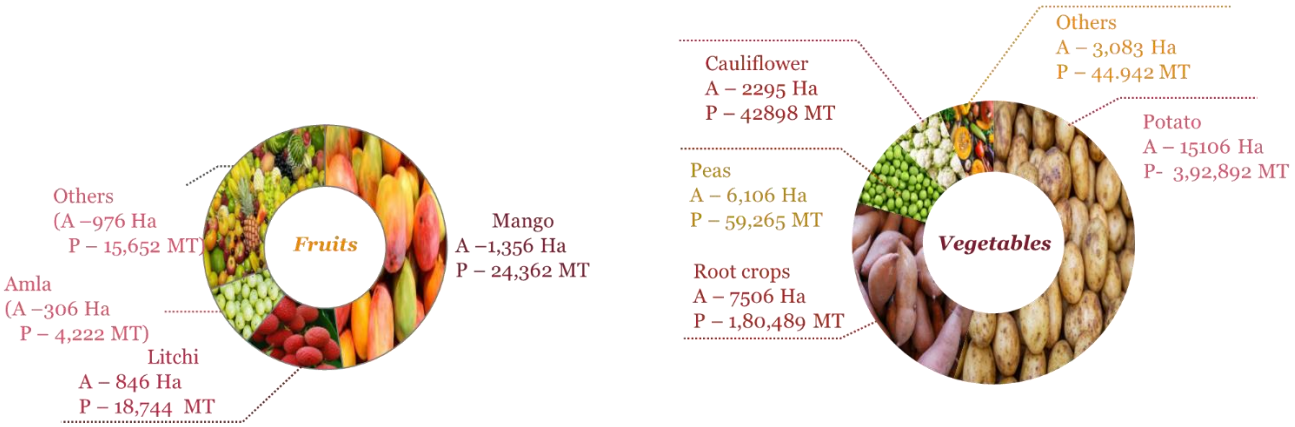
Graph 14: Production trend of agriculture crops (MT) in Hoshiarpur district

Source: Department of Agriculture, Govt. of Punjab

4.2.5. Horticulture profile

The district produces a wide range of vegetables like cauliflower, potato, peas, root crops, etc. the district is second highest produce of Peas and Potato. Major fruits grown in the district are Mango, Kinnow, Litchi and Amla. District is highest producer of Amla in the state.

Graph 15: Major Field crops grown in the district Hoshiarpur (2018-19)

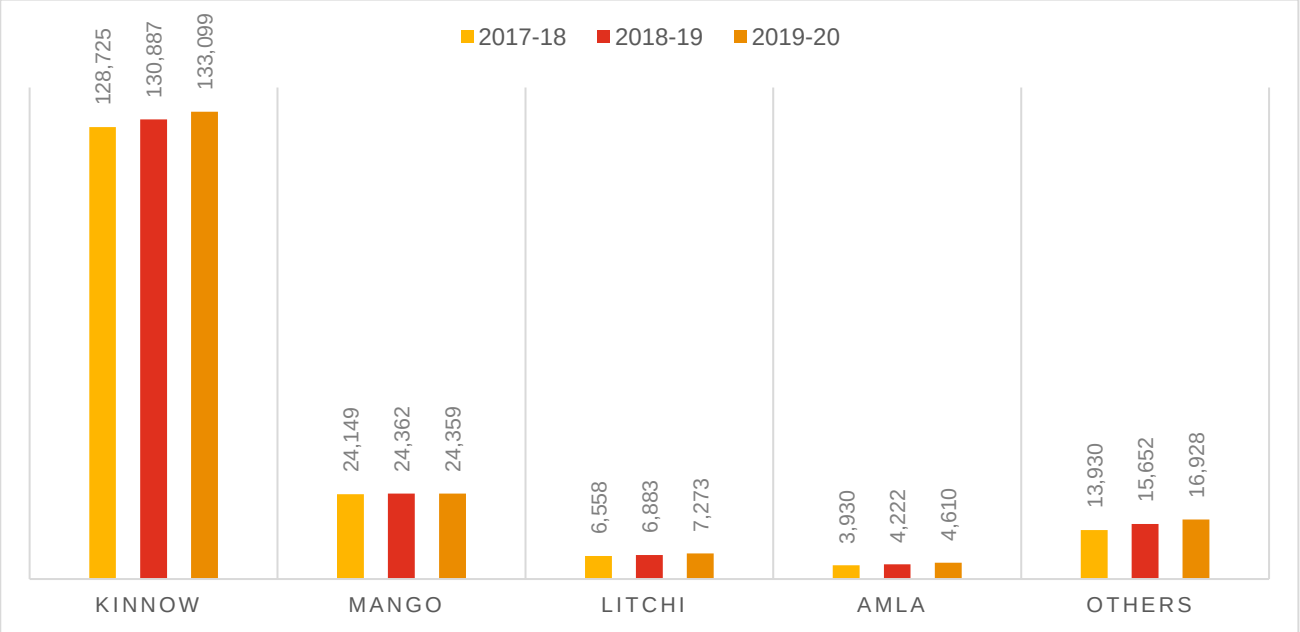


Graph 16: Major fruits and vegetables grown in the district Hoshiarpur (2019-20)

Source: Department of Horticulture, Government of Punjab

Production trend-Fruits

Fruit production in the district has seen consistent increase in production and area. Cumulative growth in production of fruit crops in last three years is 5%. Amla has recorded highest increase of 15% in the same period. Production of litchi increased from 6,558 MT in 2017-18 to 7,273 MT in 2019-20.

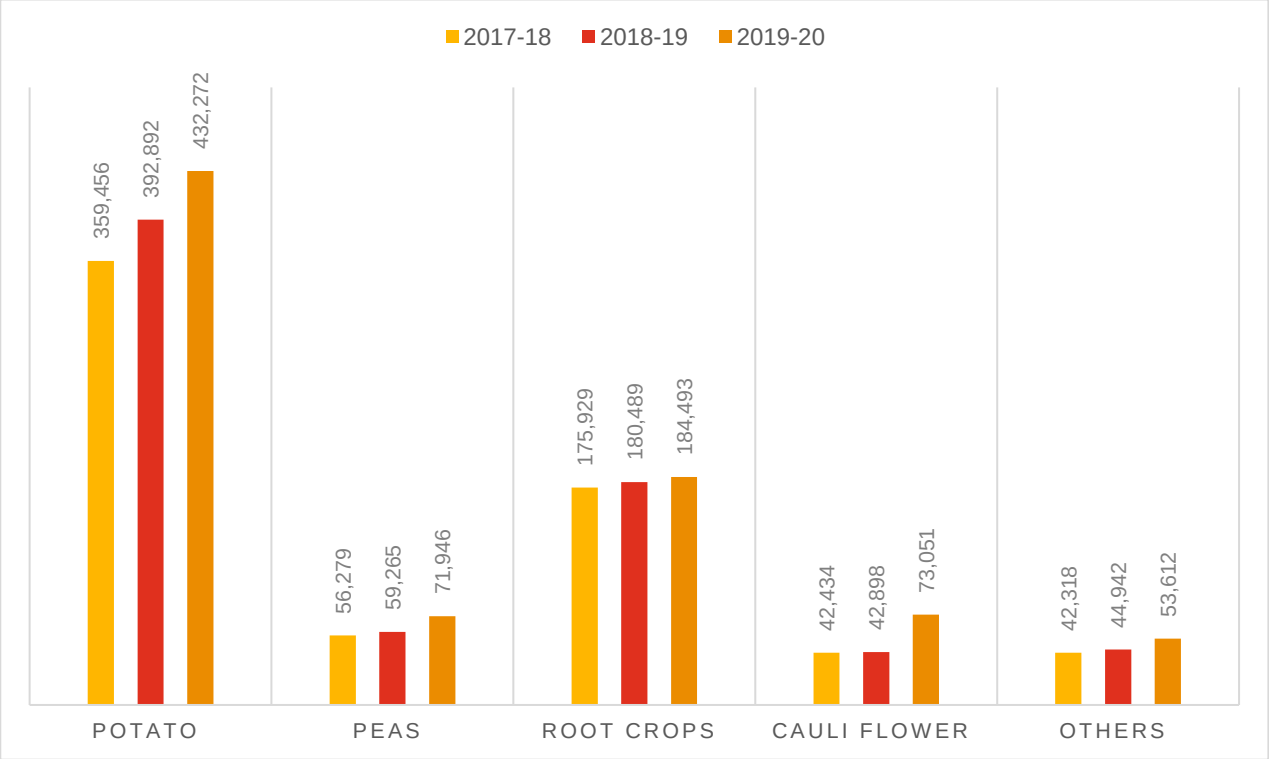


Graph 17: Production trend of fruit crops in Hoshiarpur district (MT)

Source: Department of Horticulture, Government of Punjab

Production trend-Vegetables

The area under potato is gradually growing at average 4 % per year from 13,820 Hectare (3,49,439 MT) in 2016-17 to 15,560 Hectare (4,32,272 MT) in 2019-20.It also leads in production of cauliflower, after district Gurdaspur. The area has been more or less consistent between 2,235 to 2,295 Hectare (41,757 MT to 42,898 MT) in between 2016-17 to 2018-19. However, growth in area of 73.03% was observed between 208-19 to 2019-20, subsequently production also increased from 42,898 MT in 2018-19 to 73,051 MT in 2019-20.



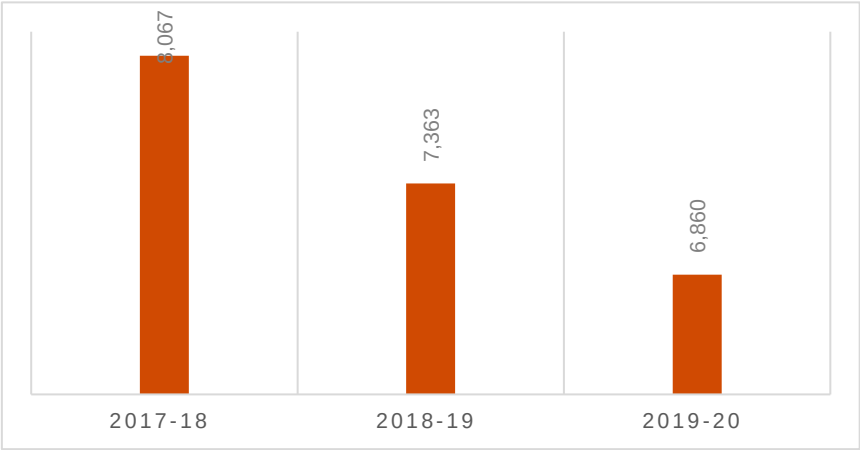
Graph 18: Production Trend of vegetables in Hoshiarpur district (MT)

Source: Department of Horticulture, Government of Punjab

4.2.6. Allied activities

Production Trends-Fish

The production of fish is going down year after year. In last three years, the production has decreased by 15% from 8,067 MT (2017-18) to 6,860 MT (2019-20).

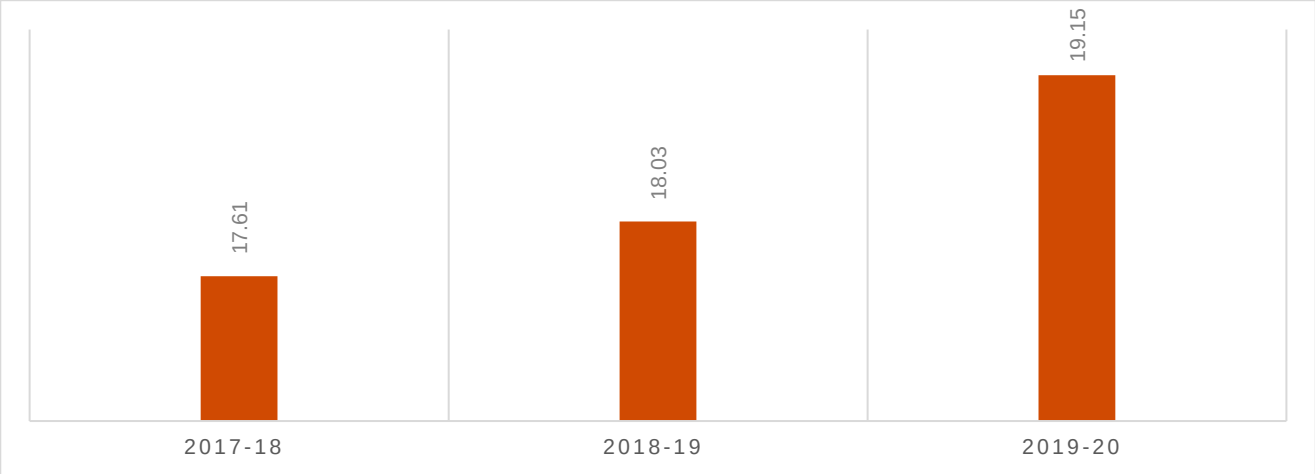


Graph 19: Production trend of Fish in Hoshiarpur (MT)

Source: Punjab State Fisheries Development Board

Production trend-Milk

Production of milk in the district has increased in last three years at an average rate of 4.5% per annum with 19.15 lakh litre/day during 2019-20.



Graph 20: Production trend of Milk in Hoshiarpur district (LLPD)

Source: Punjab Dairy Development Board

4.2.7. Industrial profile

There are 6570 registered Micro Small enterprises in the district and 21 registered medium and large enterprises providing employment to 32917 and 16606 persons respectively, as per FY 2014-15. There are one industrial areas in the district.

Table 5: Industry in Hoshiarpur (2014-15)

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	6570
2	Registered Medium & Large Units	No.	21
3	Employment in MSE Sector	No.	32917
4	Employment in Large and Medium Industries	No.	16606
5	No. of Industrial Areas	No.	03
6	Turnover of MSE Sector	Rs. Lakh	53930.93
7	Turnover of Large & Medium Sector	Rs. Lakh	741958.62

Following are the major food processing enterprises in the district:

- A.B Sugar Ltd., Randhawa, Dasuya, Hosiarpur
- Indian Sucrose Ltd., Mukerian, Punajb
- The Hosiarpur Dist. Cooperative Milk Producers Union Ltd.: Hosiarpur milk union handles 1 LLPD through its 39 BMC and 160 automatic milk collection centres. Total members enrolled in the district are 24650.

There are 25 rice shelling units, 3 medium size roller flour mills, 700+ atta chakkis.
about 300+ bakery units in the district and 100+ micro enterprises manufacturing bakery products, including namkeen etc.

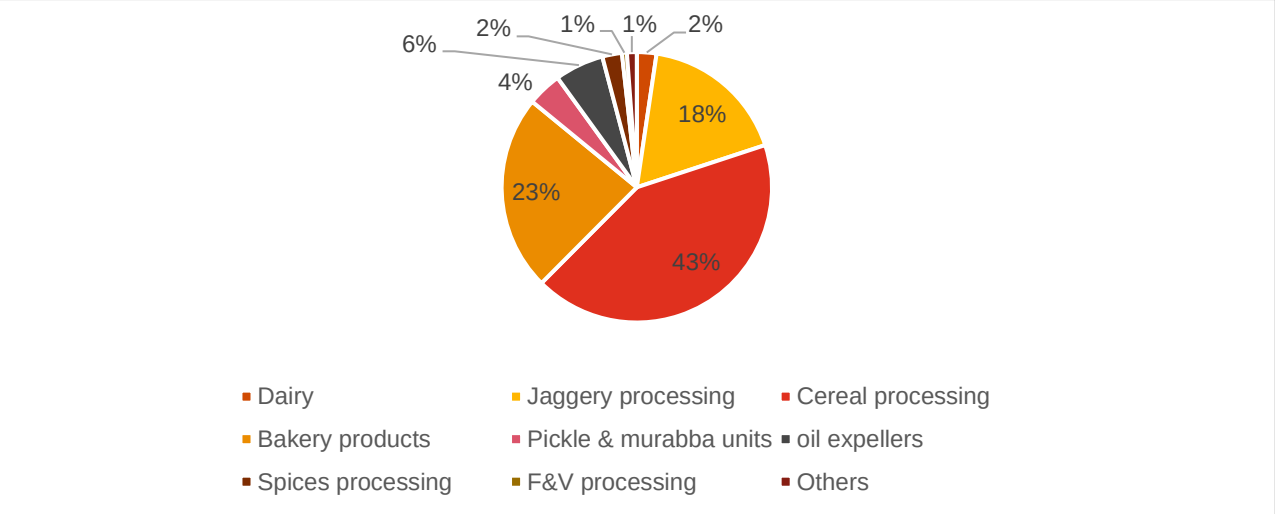
There are large numbers of individuals/FPOs/Registered Cooperatives manufacturing pickles, murraba, sherbet, chutney, juice etc. in the district.

The micro food enterprises in the district are dominated by conventional small sized rice mills with average capacity of less than 2 MT/hr. conventional atta chakkis are present all across the district. About 43% of the processors are into cereal processing. About 6% of the units are into oil expelling, most of the atta chakki owners have also installed oil expellers

About 18% of the micro food enterprises in the district are into jaggery production. Jaggery is conventionally manufactured at farm level by sugarcane growers in open pan and sold to wholesalers. Jaggery manufacturers informed us that conventionally manufactured products are in high demand in the market compared to mechanized ones. During our visit to these units, we noticed that food safety standards are not being met and adulteration is high. There are no proper sheds for manufacturing jaggery as well and no mechanism to dispose off wastewater.

Observing the potential of unorganized jaggery manufacturing facilities, Jaggery was selected as ODOP for the district.

There are various bakery units in the district it has 23% share in number of existing enterprises in the district. These bakery units include namkeen manufacturing units as well. About 90% of the bakery units are conventional in nature and require upgradation.



Graph 21: Spread of micro food enterprises in Hoshiarpur district

There are large number of SHGs, FPOs, Cooperatives in food processing activities in the district. We have visited The Unati Co-operative Marketing cum Processing Society Ltd. at Talwara. It was established in 2003 and more than 400 members are associated with them. Detailed discussion about their business and support required is summarized below;

The Unati Co-operative Marketing cum Processing Society Ltd.
• **Block:** Talwara • **Village:** Talwara • **Type of collective:** Cooperative Society registered under Punjab State Co-op 1963 • **Name of the Respondent:** Mr. Jyoti Saroop, General Manager • **Contact no.** 7717639464, 9878077736, 9464239195 • **Name of the Organization:** The Unati Co-operative Marketing cum Processing Society Ltd.
Business details: • **Year of establishment:** 2003 • **Number of members:** 400+ farmers • **Nature of business:** Aggregator, Processors

- **Average annual turnover in last 3 years**: more than INR 25 cr
- **Products:** Amla valued added products (juice ,candies, chutney, honey dipped amla, powder, pickle, Murabba etc.), Fruit based burfies (Amla, Apple, Bael, Guava, Mango, Pineapple) , value added jaggery products, fruit based vinegar, vegetables, fruits and medicinal plant based juices.
- **USP of products:** All products are certified organic products. Different certification has been obtained from APEDA, India Organic, Halal India, USDA Organic, Oner cert, FSSC 22000
- **Technical guidance/information:** Unati has association and MOUs with state agriculture universities like Punjab Agriculture University (PAU) Ludhiana, Guru Angad Dev Veterinary and Animal Science University (GADVASU) Ludhiana, CSIR Institutes like Institute of Himalayan Bioresource and Technology, Palampur, Institute of Integrative Medicine, Jammu etc. These institutes always keep on adding value to their procurement chain and new product development with their scientific inputs.
- **Procurement:** Raw material is collected and cultivated through backward integrated cooperative structure through 400+ community members of Unati. Produce is collected by farmers at village level and transported to the processing facility. Member farmers receive pre agreed basic price of the produce and share in the profit/bonuses. Ample raw material available in the cluster.
- **Processing facility:** The state of art processing facility was established under rural women empowerment programme supported by Department of Biotechnology, GoI and Punjab State Council for Science and Technology.
- **Employment generated:** 200+ employees (mostly women). Most of the work force is local except some technical positions like food technologist etc.
- **Public infrastructure:** No issues faced pertaining to roads, water availability, power or acquiring land for setting up unit

Challenges

- **Marketing & branding:** Currently most of the products manufacturing is carried out for other brands (job work). In job work mechanism products are manufactured as per the requirement of the buyer and freedom/say of the manufacturer is lost. Unati has recently started its own brand but are facing challenges to market the produce.

Support required from PM FME scheme

- Assistance for Branding and Marketing of products
- Support for setting up common infrastructure for producing value added jaggery products. PAIC to provide shed in the PPC of Mega Food Park to set up common infrastructure.

4.2.8. ODOP: Sugarcane and allied products

Globally, about three quarters of sugarcane production is used in food; the remainder is used for Biofuels or in Industrial Products. Jaggery is a natural, traditional sweetener made by the concentration of sugarcane juice and is known all over the world in different local names. It is a traditional unrefined non-centrifugal sugar consumed in Asia, Africa, Latin America and the Caribbean. Containing all the minerals and vitamins present in sugarcane juice, it is considered the healthiest sugar in the world. India is world's largest producer of sugarcane. In India, Sugarcane is processed into sugar, gur (jaggery) and khandsari (cottage sugar). The methods of converting sugarcane and manufacturing sugar, gur and khandsari are different but a great value is added in the manufacturing of these consumable final products.

During the last couple of years India has produced more than 300 MMT of sugarcane out of which, about 79.91 % is utilized in producing white sugar, 11.29% in producing jaggery and khandsari, 8.80 % as cane juice, seed cane for the next harvest etc.[31]. Sugar recovery for different states in India lies in the range of 8.89 to 11.26% on cane, whereas, recovery of jaggery (gur) ranges from 10-13% depending upon the variety of sugarcane, sugarcane quality, soil texture, irrigation facilities, time of cane crushing etc. India is the largest producer and consumer of jaggery; out of total world production, more than 70% is produced in India. Jaggery along with

[31] IIFPT

khandsari has withstood competition protecting farmers' interests besides meeting ethnic demands. Jaggery prepared in all parts of the country. It is also known as gul, gur, vellum and bella.

Sugarcane is the raw material for the production of white sugar, jaggery (gur) and khandsari. Jaggery is among major agro processing industries in India. Nearly 20-30% of total sugarcane produced in the country is used for manufacture of about 7 million tonnes jaggery. This sector provides employment to about 2.5 million people. It is, therefore, imperative to expand the sector, as it provides higher food value jaggery at lower cost and boosts-up the rural economic system, involving low transportation cost of raw material, and non-requirement of highly technical machinery and labour. Jaggery still dominates in preparation of various traditional products like reori, gazak, chikki, patti and ramdana, etc. Kakavi (liquid jaggery) is part of daily diet in most parts of Maharashtra and has been gaining commercial importance in India.

Jaggery is rich in important minerals like salts: 2.8 g/100 grams, whereas only 300 mg/kg is obtained in refined sugar. Jaggery is an important sweetening agent added to beverages and foods for increasing palatability. Over the years, food habits of human beings have been greatly influenced by research and developmental activities and also due to their health consciousness.

Approximately 80 percent of world sugar is produced from sugarcane in tropical and subtropical regions, and the remaining 20 percent is derived from sugar beet, which is grown mostly in the temperate zones of the northern hemisphere. Production of sugar has become increasingly concentrated and top-five major producers account for about 60 percent of global output.

Brazil and India together account for about 60% of the global sugarcane production.

The international sugarcane production season spans from September to August whereas in India it is Oct to Sep. Around 50 million tons (30 percent of global production) of raw sugar is traded on the global market annually with Brazil being the world leading sugar exporter accounting for 29 percent of world exports, followed by Thailand (10 percent) and Australia (7.6 percent).

Indian sugarcane production is highly cyclical in nature with both acreage and yield, accounting for the variability in production. Higher sugarcane production results in falling sugar prices and non-payment of dues to farmers compelling them to switch to other crops thereby causing a shortage of sugarcane, consequently leading to an increase in sugarcane prices, resulting in an imminent switch back to sugarcane. Such a vicious circle is characteristic to Indian sugarcane production. While acreage and yield stand as the key drivers in deciding the sugarcane output, an analysis on the sugar production trends reveals that sugar production not only depends on cane production but also on other factors such as sugar recovery rate and the extent of cane diverted for different uses, with both the variables exhibiting a significant positive correlation with prices.

Sugarcane based industry have a very important role in strengthen the linkages to agriculture. Sugarcane based industry provides an excellent potential in promoting the integrated development of sugarcane industry and in transforming the rural economy as dynamic and buoyant industrialized economy.

As the major producer of Jaggery, the country has recognized as one of the leading traders and exporters of Jaggery to the world. India exported 3,41,155.34 MT of jaggery and confectionery products to the world for the worth of Rs. 1,633.22 crores/ 227.90 USD Millions during the year 2019-20. Sri Lanka Dsr, Nigeria, Nepal, Malaysia, Tanzania Rep. were the major importing countries of Jaggery from India.

4.2.8.1. Clusters of jaggery & allied product:

4.2.8.1.1. National Clusters: Sugarcane cultivation & Govt. support policies

Sugarcane and Sugar play a significant role in India's economy, trade and livelihood. Sugar is country's second largest agro-based industry, next to cotton. The sugar industry is a source of livelihood for about 5 crore farmers and their families and 5 lakh workers are directly employed with the sugar mills[32].

[32] Final Report of the Task Force – Sugar and Sugarcane Industry (March 2020) – NITI Aayog

Table 6: Leading sugarcane producing states in India

State	Area	Production
Uttar Pradesh	44%	44%
Maharashtra	23%	22%
Karnataka	9%	10%
Tamil Nadu	3%	4%
Gujarat	3%	3%

Source: Indiastat (Ministry of Agriculture and Farmers' Welfare, Govt. of India)

Average annual production of sugarcane during the year 2019-20 was around 3.70 lakh MT that contributed to the production of approx. 274.2 MT of sugar.

Uttar Pradesh is the highest sugarcane producing state in India followed by Maharashtra. Uttar Pradesh and Maharashtra account for around 65% of the production in the country followed by. The other states involved in sugarcane production in India include Karnataka, Tamil Nadu, Gujarat, Haryana, Bihar, Tamil Nadu, Punjab, Andhra Pradesh, Telangana, Assam Uttarakhand Karnataka, Tamil Nadu, Gujarat and Haryana Chhattisgarh.

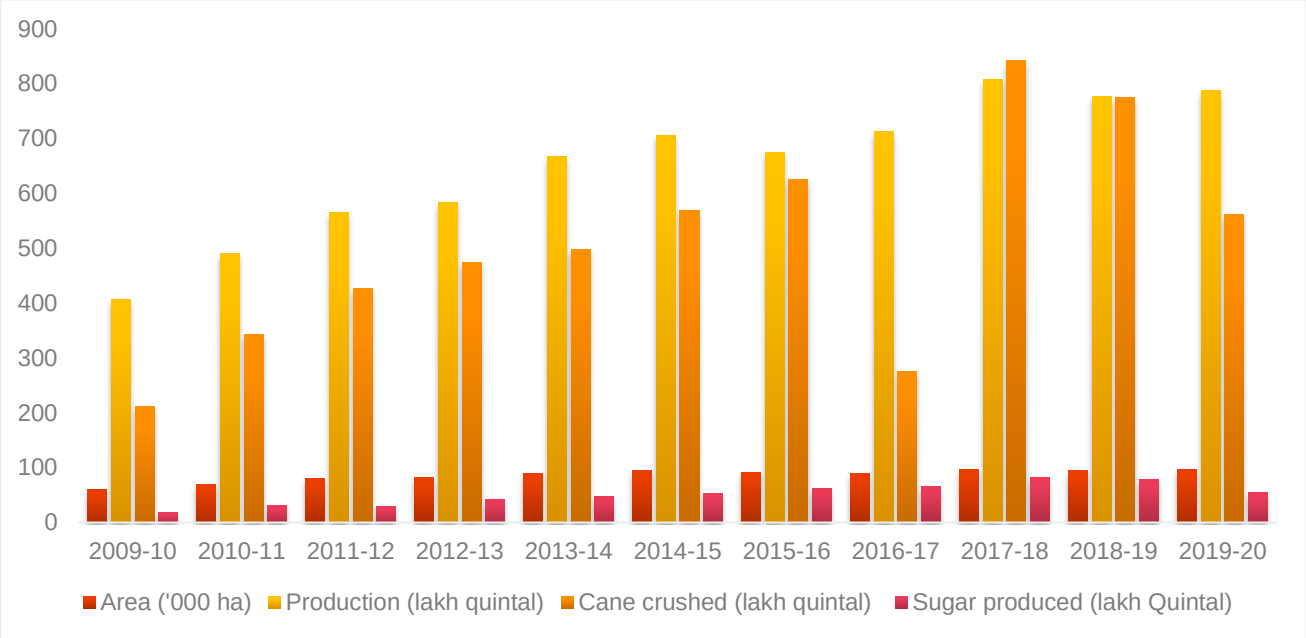
In India, sugarcane is grown primarily in two distinct agro-climatic regions i.e. tropical and subtropical. Uttar Pradesh, Maharashtra, Tamil Nadu, Karnataka, Andhra Pradesh, Gujarat, Haryana, and Punjab are some of the leading states in sugar cane production.

Despite witnessing pressure of industrialization, the jaggery industry has flourished in different states of the country viz., Uttar Pradesh, Tamil nadu, Karnataka, Maharashtra and Andhra Pradesh. The increasing trend of their production can be attributed to peoples' liking towards jaggery in rural areas mainly due to its nutritional and medicinal values. Further due to these values, jaggery has great export potential. It can further be observed that the lack of infrastructural facilities in production and insufficient price dissemination in marketing were major constraints faced by jaggery manufacturers in India. Therefore, processing of sugar cane into various value-added products such as Jaggery powder can ensure nutritional and food security, improved profitability and also offers huge scope for entrepreneurship development at micro, small or medium scale levels using effective government schemes such as PM-Formalization of Micro Food Processing Enterprises Scheme of MoFPI, Government of India

4.2.8.1.2. Clusters within the state: Hoshiarpur, Fatehgarh Sahib, SAS Nagar and Gurdaspur

In 2019-20, area under sugarcane was 96,000 ha with a production of 708 lakh quintal. Out of this available sugarcane, 561 lakh quintals were crushed by the sugar mills and 54.83 lakh quintal sugar was produced by these 16 sugar mills. Presently there are 16 sugar mills running in the state with a cumulative crushing capacity of 51266 TCD. Out of which 9 are co-operative and 7 are private. In addition, there are micro food enterprises involved in production of Jaggery.

Production of sugarcane has increased from 406 lakh quintals in 2009-10 to 788 lakh quintals in 2019-20.



Graph 22: Year wise area and production of sugarcane and cane crushed & sugar produced in Punjab

In addition, there are about 250 Jaggery manufacturing units in Hoshiarpur district. Majority of these units are located on the Dasuya – Tanda, Hoshiarpur - Hariana roads. Baring a couple of units, all these units need technological up-gradation thereby enhancing quality, competitiveness and out-reach of their products. Most of the micro enterprises involved in jaggery production follows conventional system of production through open pan boiling furnace, molding of jaggery in wooden panel etc. Juice extraction, filtration and boiling of juice for concentration and then cooling and solidifying to give jaggery blocks. During boiling chemical bleaching agents or natural vegetable items like Bhindi (Lady finger) are added to clean the juice and the extraneous matter is constantly removed to give a bright golden color. Many processors bring labour from UP (Muzaffarnagar and Shamli) and are involved in jaggery production for the season. They generally do the processing along the highway (Phagwara-Nawanshahr, Phagwara-Jalandhar, Phagwara-Nakodar roads, Phagwara-Goraya-Phillaur). Adulteration is high in these units and price is lower compared to others. Chemical used in Jaggery production is Safolite and red oxide for coloring and bleaching the jaggery**.** None of the units visited has arrangement for discharge of effluent discharged. Hygiene is not maintained by the units in production.

Hoshiarpur is fast emerging hub for micro-processing enterprises of various products. The processing of sugarcane to Jaggery, Shakkar and other products appears to be the most lucrative segment which could be further boosted through the benefits of the PMFME Scheme. It will not only support the farmers in better price realization but will also push for investments in formalization of the unorganized jaggery processing units thereby creating an inclusive employment opportunity.

Major varieties cultivated in Punjab are CoJ 64, CoJ 1148 and CoJ 81 etc.

4.2.8.2. Turnover and employment generation in the cluster

Mainly farmers with medium to large landholdings are engaged in the cultivation of sugarcane. During our interaction it was found out that small and marginal farmers are not showing much interest due to the risk involved in the marketing of the sugarcane. As mentioned above, processing is generally happening at small scale level, where sugarcane is proceed into jaggery in through traditional units also called "**kulahdi or Belna"** in local language. These units are generally owned by the farmers themselves. Recently, trend of running the units by the migrants have also increased, who procured the sugarcane from local farmers.

It is difficult to gauge the exact turnover due to highly inorganized nature of the industry but estimates from our discussion with farmers and processors suggest that there are more than 250 such units in Hoshiarpur district

alone. Similarly, other district also have 100-150 units. One units has the average turnover of around 5-10 lakhs. Considering this, the total turnover from jaggery proceeding is estimated to be more than 30 cr and around1500 people are directly employed by these units.

4.2.8.3. Human resource and skill set

The small jaggery processing units in the cluster district provides seasonal employment to around 1500 people. Operation is largely manual which people learn through experience. It is a time-consuming operation, which requires a lot of hard work starting from the harvesting of sugarcane to jaggery production. Skills of jaggery processing are passed through generations. No formal training or skill set is possessed by the people employed in these units.

During our interaction, we found that there is a dire need formal training to be provided to these farmers cum processors on various aspects of manufacturing and hygiene aspects. Along with this, these small and unorganized units should be supported under the individual enterprise component of the PM FME scheme in order to help them with upgradation of existing structure.

4.2.8.4. Institutional support and support infrastructure

Like other areas of the state, general infrastructure in the form of road connectivity, power availability is good in the cluster area. It helps them the in better accessibility for the growers to take their produce to processing units. It also helps the micro processing units in marketing as customer finds it convenient to approach them.

It is worth mentioning here that no specific infrastructure related to jaggery processing such as testing lab, incubation center or common infrastructure is available in the cluster districts. During our discussion, it was found that processing is happening through traditional means. The advanced jaggery processing units require heavy capital investment which farmers and processors find difficult to afford. It is in this regard that an advanced technology-based incubation center is the need of the hour in Hoshiarpur district. This incubation center could help the growers in accessing the processing facilities without the requirement of a large amount of capital investment from th

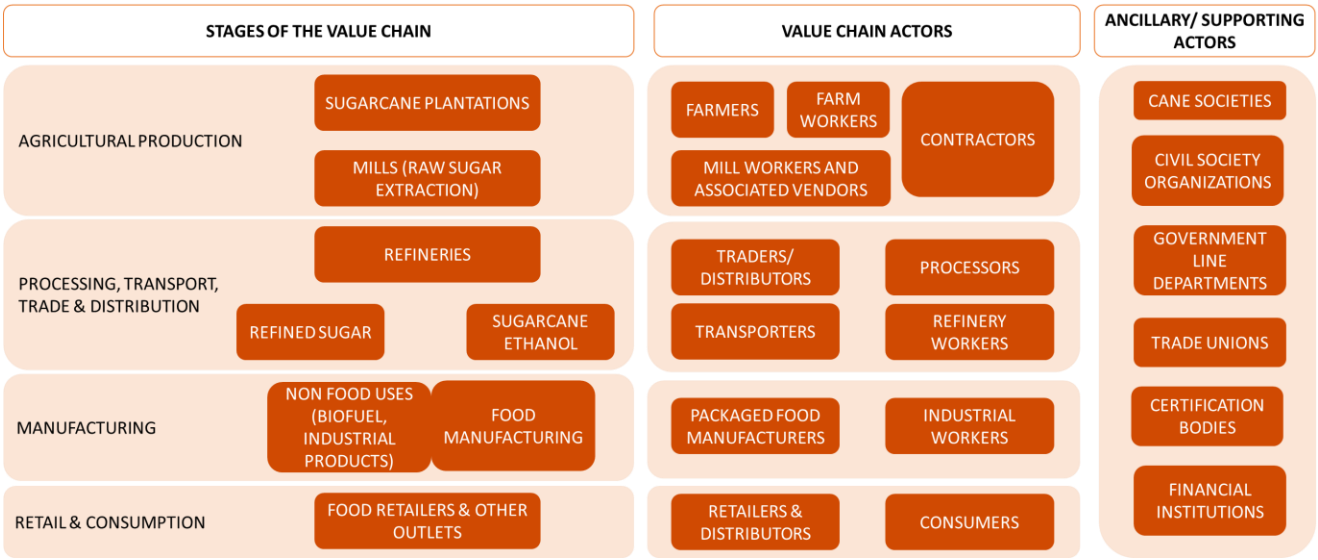
4.2.8.5. Quality Specifications/parameters

To make good Jaggery (Gur), soil condition should have 7 PH. Soil should be a little granular so that water may be drained to avoid water logging. Quality of Jaggery (Gur) mainly depends on juice clarification. If juice is properly clarified quality of the Sugar will be white crystalline in appearance and good in taste. Jaggery may be light golden, golden, dark golden, light brown or brown in color. People from different region have different criteria for the best quality Jaggery. In north India Jaggery (Gur) with amorphous texture with slightly lower sucrose content is preferred, in south India crystalline Jaggery with characteristic yellow color is liked.

Testing of Samples: quality against mandatory FSSAI parameters

4.2.8.6. Value chain actors in cluster districts

Sugarcane processing is dominated by sugar mills spread across India. They procure sugarcane from farmers and process it to sugar and allied products. Sugar mills are either cooperative owned or private owned. By products of sugarcane processing has industrial uses as well.



The channels adopted for marketing of Jaggery are generally influenced by the factors like location of the growers, distance of the market centres, townships and processing units.

During our visit to Hoshiarpur and Gurdaspur stakeholders informed that average cost of production of 1 quintal of Sugarcane is Rs. 250, Jaggery produced from 1 quintal is 12 kg. Average jaggery production cost from 1 quintal of sugarcane is Rs. 100. Jaggery is sold at Rs. 60-70 per kg, while value added jaggery is sold from Rs. 100 to 200 per kg based on the ingredients used. Hence, Jaggery manufacturing is a remunerative business for farmers.

Three marketing channels were identified in Jaggery marketing in the state.

Channel I: In the first channel commission agent procure jaggery from farmers who manufactures jaggery at its farm gate. In this channel commission agent provides credit to farmers for cultivation of sugarcane prior to the harvesting season. Wholesalers purchase jaggery from commission agents and then sell to retailers in bulk. Retailers sell jaggery to consumers in small quantities of 500 gms, 1 kg etc.

Figure 11: Marketing channel of Jaggery

Channel II: In this channel farmers are benefitted more when compared to earlier channel. Retailers also reap more benefits when compared to the farmers as high margins are obtained by the retailers.

Channel III: In this channel farmer process sugarcane to jaggery at its farm gate and sell it directly to consumers. We have visited all types of units with different marketing nodes in Hoshiarpur.

Some of the enterprises are involved in export of jaggery as well from Punjab to USA, Canada, Middle East etc.

4.2.8.7. Value Added products of jaggery

Value added products of jaggery are Confectionary Products, Aurvedic Jaggery, Gur-Patti, Liquid jaggery, Gur Laia Laddu, Ram Dana Laddu, Til Laddu, Gur Gazak/Chikki, Gur-Chocolate, Gur Burfi and Gur containing nutritional and medicinal substances are being manufactured. Two processes are mainly being followed in India. One is old indigenous method and the other is modern sulphitation process. A typical Jaggery industry has 1-20 furnaces. The size of the units for Jaggery ranges 1-15 TCD. The recovery of jaggery is 9 % (traditional process) to 13 % (modern process) of cane crushed.

a) Traditional Manufacturing Process:

In traditional industry, jaggery manufacturing involves four basic steps i.e. Juice extraction, purification, concentration by open pan boiling and Solidification of concentrated juice. Following the crushing of the sugar cane (using animal power), clarification of cane juice is done by simple mucilaginous extracts of vegetable plants. The extract is gradually added in the heated juice just before it starts boiling and scum rises to surface, which is removed by a perforated ladle leaving clear and transparent juice in the heating pans. The clear juice is concentrated in open pans till the boiling mass attains a temperature of 106°C and the massecuite (rab) produced is allowed to crystallize. The sugar recovery in this traditional process is about 5.5%.

Figure 12: Jaggery manufacturing process flow

Nearly 70% of the global production of jaggery is done in India and this sector supports huge rural economic system providing employment to millions of people. Jaggery manufacturing is considered as a big cottage industry under unorganized sector; it is produced mostly by small and marginal farmers employing semi-skilled persons. The process involved is a traditionally, labor-intensive and also time consuming. Being the major agro-processing industry in the rural sector, there is a greater need to uplift the jaggery processing sector which would thus provide higher value jaggery and jaggery based products at reasonable cost and would in turn help the rural economic system to prosper. Hence a mechanized process for jaggery production will reduce the drudgery involved.

In India, about 30 lakhs MT of jaggery is stored generally, for consumption purposes, throughout the year. According to the estimates, about 10 per cent loss takes place in the quality and quantity of jaggery especially during the monsoon. Therefore, care should be taken to keep it away from moisture and air. Free flowing nature of granular jaggery with low moisture content (up to 1-2 % dry basis), offers advantages in terms of its increased storage life up to two years, compared to the solid moulded jaggery. In India, approximately 80 per cent of jaggery prepared is solid jaggery and remaining 20 per cent includes liquid and granular jaggery. So, a good quality granular jaggery with proper packaging has a long shelf life and by this, storage losses can be eliminated. This reflects the huge scope for the production of jaggery powder. The never-ending demand for high quality, green & clean labelled, organic, nutritious food products like Jaggery, amongst the diet conscious people has inspired innovations in the food processing sector in terms of technology and engineering, design of machinery, etc. Value addition to the existing product line with a view to provide health and wellness to its consumers is now becoming a priority. Objectionable chemicals are used at times to produce better quality jaggery. But now the trend has driven the use of natural clarifying agents of vegetable origin in the process. Looking to its nutritional status and current inclination of people for natural products, jaggery has immense growth potential market both in national & international market.

4.2.8.8. Packaging and storage of jaggery

In India the traditional methods of jaggery storage prevalent in western and eastern regions like open storage, matka, gunny bags etc. These methods don't work in Tarai regions because climatic conditions are not favorable for keeping quality of jaggery as there is very high humidity in these areas. During mansoon period, due to high humidity range, jaggery samples get infected with microbial activity and thus keeping quality of jaggery goes down. Jaggery samples could be stored in cold storage but sometimes it is difficult to store the samples for small scale farmers as cost involved is the main constraint for that. Also, the energy consumption is very high. Jaggery from cold storage is used in off-season at high cost.

For wholesale purpose jaggery is packed in carton boxes and sent to distant markets like New Delhi from production clusters like Hoshiarpur. Some micro enterprises are packing jaggery cubes and powders in polythene bags with labels and proper branding.

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4.2.8.9. Product cost analysis

During our visit to Hoshiarpur and Gurdaspur, stakeholders informed that average cost of production of 1 quintal of Sugarcane is Rs. 350 and Jaggery produced from 1 quintal is 10 kg. Average jaggery production cost from 1 quintal of sugarcane is Rs. 200. Jaggery is sold at Rs. 60-70 per kg, while value added jaggery is sold from Rs. 100 to 200 per kg based on the ingredients used. Hence, Jaggery manufacturing is a remunerative business for farmers. But it all depends upon the sale of the produced jaggery. Retail sale can easily fetches Rs 60-70/kg price. But sometime, processors finds it difficult to sell the volume through retail sale have to rely on traders, who provide low price(Rs40-45/kg). Following table shows the products cost and profit through sale of 1 kg jaggery in retail.

Cost analysis for 1kg retail sale-jaggery

Sr. No	Particulars	Amount
1	Raw material cost(Sugarcane)	35
2	Transportation and logistics	2
3	Production cost	2
4	**Total Cost**	**39**
5	Sale Price	70
6	**Profit**	**31**

4.2.8.10. Major issues faced by the processors and producers

As mentioned above, generally small jaggery processing units in the cluster districts are owned by farmers themselves only. These farmers cum processors faces multitude of challenges resulting in impeded growth for them Some migrants have also started to operate the processing units on their own in recent times from the insights gained from interaction with producers and processors, their overall challenges faced by them can be described as below:

Low visibility resulting in lower sales volume: Marketing is one the most significant challenge faced by these small processors. They don't have much visibility, which result in lower sale volume through retail sale. Although the product is of good quality and without any adulteration, but still sale is not high due to lack of marketing. These small processors themselves are not able to take up the marketing due to technical know-how and financial

constraints. Creation of common brand can and marketing of the same can help them in accessing the untapped market.

Processing through traditional methods: As mentioned above, majority of the processors in cluster districts produce the jaggery through employing traditional method, which results in lower margin due to reduced yield. They lack the financial capacities for upgrading to the modern methods.

Rising production cost: Production cost in increasing continuously due to increase in labour and raw material cost. It is resulting in lower margins for the processors. High wastage during the course of production also contributes to lower margins for the processors.

4.2.8.11. Identified Gaps

Various gaps were identified at the firm and cluster level, where work needs to be done in order to increase the scale of activities for ODOP in cluster districts. Following are the major firm level and district level gaps identified through stakeholder consultations.

S. No	Sectors	Gaps	Recommendations
1	Skill training needs	Lack of technical know-how on safety and hygiene maintenance	Training and capacity building with special focus on meeting the food safety requirement and maintaining hygiene during production process
2	Branding and marketing	Inability to market the product resulting in lower visibility.	Creating a common brand under the PM FME scheme for marketing of jaggery and other value-added products
3	Technologies	Traditional methods resulting in lower yields of jaggery leading to lower margins.	Helping the existing units to upgrade their structure through individual enterprise component of PM FME, which can result in up to 30% increase in jaggery yield.
4	Common facilities	Setting up a modern jaggery processing plant is a capital-intensive project which small processors will not be able to afford.	A common incubation center can be set up in Hoshiarpur district, which can help the farmers and processors in accessing the modern machinery without making heavy capital investment.

4.2.8.12. SWOT Analysis

As mentioned earlier, Sugarcane has been selected as ODOP for Hoshiarpur, Gurdaspur, SAS Nagar and Fatehgarh Sahib district. Following is the SWOT analysis for the sugarcane-jaggery and allied products in these districts.

SWOT Analysis	
Strengths: • Presence of large number of micro enterprises in the districts. • High production volume of sugarcane crops in the districts. • Market linkages with large important urban centres like Delhi.	**Weakness:** • Low availability of capital to scale up the activities. • Increase in production cost. • Dependence on traditional processing methods.

Opportunities:	Threats:
• Area is gaining reputation for the production of quality product. • Opportunities for export of the processed product.	• Seasonal fluctuation in prices of finished product. • High competition due to presence of large number of players. • Lack of efficient marketing channel.

4.2.8.13. Way Forward: Areas of interventions & suggestions

The sugarcane processing industry in the cluster districts has the potential of promoting crop diversification which can help the farmers escape vicious paddy wheat cycle. Therefore, the jaggery manufacturing through small processing units should be promoted in a big way due to its potential impact. Various components of PM FME scheme can be leveraged to catapult the jaggery processing to higher level. From the detailed discussions with the units, we are proposing various intervention for the development of ODOP based industry in the cluster districts.

4.2.8.13.1. Support in branding and marketing

Branding and marketing of the produced jaggery is a significant challenge resulting in limited outreach for the units. . They don't have much visibility, which result in lower sale volume through retail sale. Although the product is of good quality and without any adulteration, but still sale is not high due to lack of marketing. These small processors themselves are not able to take up the marketing due to technical know-how and financial constraints.

Branding and marketing support through creating a common brand for the jaggery produced from these units can go a long way in ensuring the development of these units. PM FME scheme has the component of branding and marketing for supporting the micro enterprises with branding and marketing. A common brand will help in increasing the sale through enhanced outreach of the pickle and murabba from Amritsar.

4.2.8.13.2. Establishment of common infrastructure or incubation center

Incubation centre is a type of common infrastructure which can be established under the scheme. As per the guidelines, the incubation centre should involve one or more product lines which could be utilized by the smaller units on a hire basis for processing of their produce.

These processors carry out processing through traditional operations as they are unable to make large capital investment. It is the one of the biggest challenge which has impeded the growth for these small processors. Traditional operation results in lower yield as compared to the use of modern and sophisticated machinery. A common infrastructure or incubation center in Hoshiarpur can help the units in scaling up the operations without making heavy capital investment in the purchase of machinery.

4.2.8.13.3. Support to existing jaggery units through the individual enterprise subsidy component

The PM FME scheme has the component of individual application, where the processors can be provided with the benefit of credit linked subsidy to help them in upgradation of their units. The units in the cluster districts should be encouraged to take the benefits under the individual component of the scheme through awareness creation. It can help the units in upgradation of their existing infrastructure.

4.2.8.13.4. Training and capacity building of the jaggery manufacturing units under the scheme

It was found that these processors lack the skills and technical know-how to scale up the activities through modern techniques. Training and capacity building component of the scheme can be leveraged for the training and capacity building of the enterprises. Training and capacity building can be undertaken on topics like food safety and hygiene, better manufacturing practices, branding and marketing etc. It can help the enterprises in expanding their knowledge base for scale up of activities.

Suggested interventions

Particulars	Gaps/ Problems	Suggested Interventions	Intervention Agencies	Actions under PMFME
Processing units	• Lack of access to modern technology • Dependance on traditional method for the jaggery manufacturing • Lack of access to credit for expansion • Lack of value addition as units are only dependent on sale of jaggery	• Extending the benefits under individual and group component part of the scheme • Exploring the opportunities for demonstration of modern technology	• Individual entrepreneurs • Farmers • SHGs • Farmer Producer Companies • Existing Processing Units • KVKs • Private Institutions	• Assistance under the individual and group component part of the PMFME scheme
Capacity Building	• Low technical know-how on processing process and hygiene • Lack of formal training on processing	• Training and capacity building under PMFME scheme	• State Level Technical Institution, PAU Ludhiana • DRPs	• Mobilization of potential beneficiaries for training
Marketing & Branding	• Overdependence on traders for the sale of produce • Low emphasis on packaging resulting in quality deterioration • Low emphasis on value addition	• Development of common brand for selling of produce • Helping the enterprises in establishing forward market linkages with institutional players.	• SNA • Farmers/ Investors/ SRLM	• Establishment of common brand under the branding and marketing component of the scheme
Common Incubation Facility	• Requirement of high capital to set up infrastructure for value added jaggery products	• Creating a common infrastructure manufacturing value added products of jaggery	• SLTI • SNA • Private Institutes	• Setting up of common incubation facility for value added products at Hoshiarpur

				and Gurdaspur

4.2.9. Non ODOP

Other than Jaggery, poultry has potential of processing in the district. There are over 90 commercial layer and broiler farms (poultry). There is no modern slaughtering plant in the district. However, there are more than 500 shops/individuals who are engaged in manual culling of birds/animals for selling daily fresh meat.

With increasing pea production in the district there is a scope of pea processing in the district like pea dehydration unit

4.3. Rupnagar

4.3.1. Socio economic profile

The district adjoins district Una (Himachal Pradesh) in the North, district Hoshiarpur in the North West and district Ludhiana and district Patiala in South West. The major towns of the district include Rupnagar, Kharar, Chamkaur Sahib, Anandpur Sahib,Morinda, Nangal Township and Naya Nangal. **The district Roopnagar is one of the smallest districts** of the State. There are 588 inhabited villages in the district

The town is said to have been founded by a Raja called Rokeshar who ruled in the 11th century and named Rupnagar after his son Rup Sen . The recent excavations carried out at Rupnagar have proved that this town was the seat of well-developed Indus Valley Civilization. The District has rich historical and religious significance behind it.

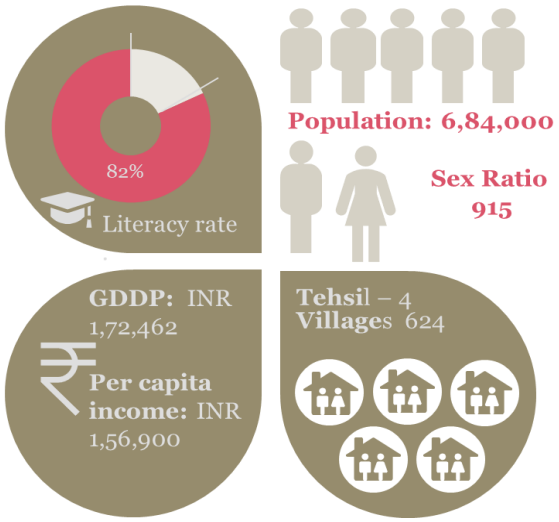
Rupnagar is the district headquarter and the district is comprising of four tehsils namely; Rupnagar, Sri Anandpur Sahib, Nangal and Sri Chamkaur Sahib. The District has 5 blocks namely Sri Anandpur Sahib, Nurpur bedi, Rupnagar, Sri Chamkaur Sahib and Morinda

The district has highest Gross District Domestic Product (GDDP) and per capita income amongst all the district in the state.

4.3.2. Demographic profile

According to 2011 Census, Rupnagar has a population of 684,627 comprising 52% males and 48% females and this makes 2.5 % of State's population. Out of the total population of the district 74% are residing in rural and 26% in urban areas.

The district has a population density of 505 inhabitants per Sq Km. Its population growth rate over the decade 2001-11 was 8.9%. The district has a sex ratio of 915 females per 1000 males and a literacy rate of 82.1%[33].



Graph 23: Socio economic profile of Roopnagar district

Source: Census 2011

4.3.3. Climate and Rainfall

The district is located in the sub mountain region of the state. It is interspersed with low hills of Katar Dhar and Kolhai range of the Shivaliks. The districts proximity to the outer Himalayan Range brings moderation and severity to the summer and winter seasons respectively. The climate of the district is characterized by dryness (except in the brief monsoon seasons), a very hot summer and bracing winter. In summer the maximum temperature may touch 47^{0}C and in winter, the minimum temperature may dip as low as 1^{0}C – 4^{0}C on some days. The average annual rainfall in district is 775.6 mm.

[33] Census 2011

4.3.4. Agriculture profile

Agriculture is the backbone of the district, and an overwhelming 74% of its population residing in rural areas. The major kharif crops are Sugarcane, Paddy & Maize and rabi crops are Wheat, Gram, Lentil and Oil Seeds.

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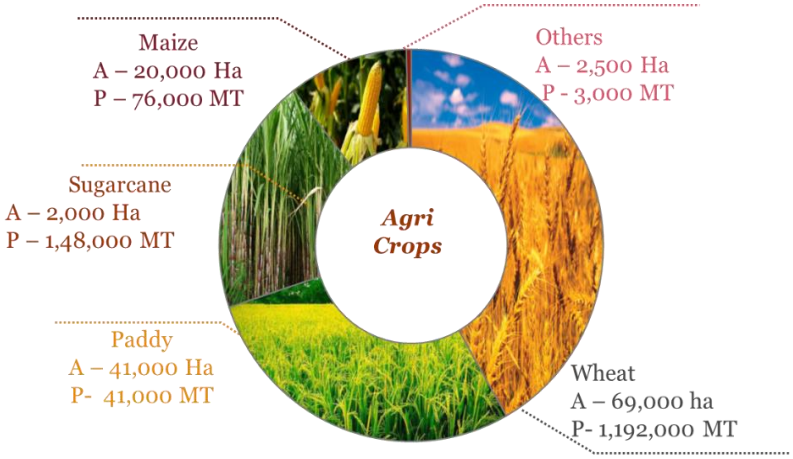
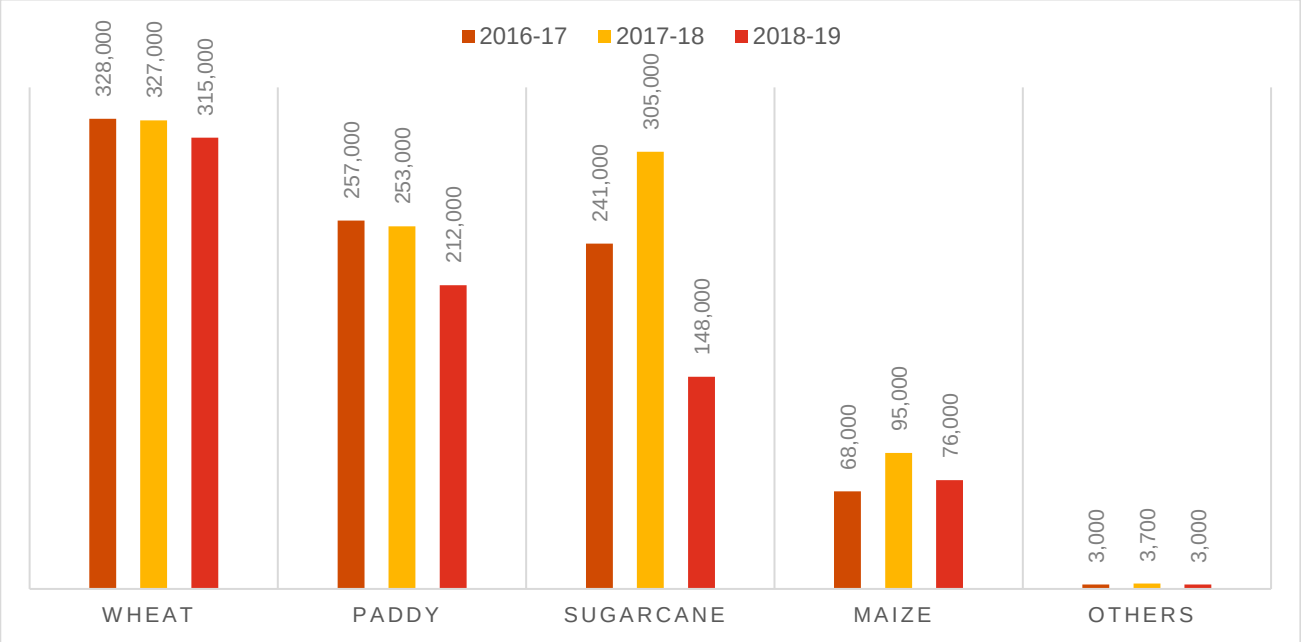


Graph 24: Major Field crops grown in the district Rupnagar(2018-19)

Source: Department of Agriculture, Govt. of Punjab

Wheat and paddy are the main rabi and kharif crops of the district. However, **the area and production of these crops is one of the lowest, after district Pathankot and district Mohali**with 69,000 Hectare (3,15,000 MT) and 41,000 Hectare (2,12,000 MT) in 2018-19. **Maize is the 3rd most major crop of the district and the area under this crop is second amongst all districts after Hoshiarpur. The area under maize has been fluctuating from 18,000 Hectare (68,000 MT) in 2016-17 to 23,000 Hectare (95,000 MT) in 2017-18 and 20,400 Hectare (76,800 MT) in 2018-19.** The district also grows sugarcane and area under this crop has also shown erratic behaviour with 3,000 Hectare (2,41,000 MT) in 2016-17 to 4,000 Hectare (3,05,000 MT) in 2017-18 and 2,000 Hectare (1,48,000 MT) in 2018-19.The district also grows bajra, kharif oilseeds (sesamum), barley, rabi oilseeds sarson and taramira in small quantities with 400 Hectare (200 MT), 200 Hectare (100 MT), 100 Hectare (400 MT), 1,500 Hectare (1,900 MT) and 300 Hectare (400 MT) respectively during 2018-19.

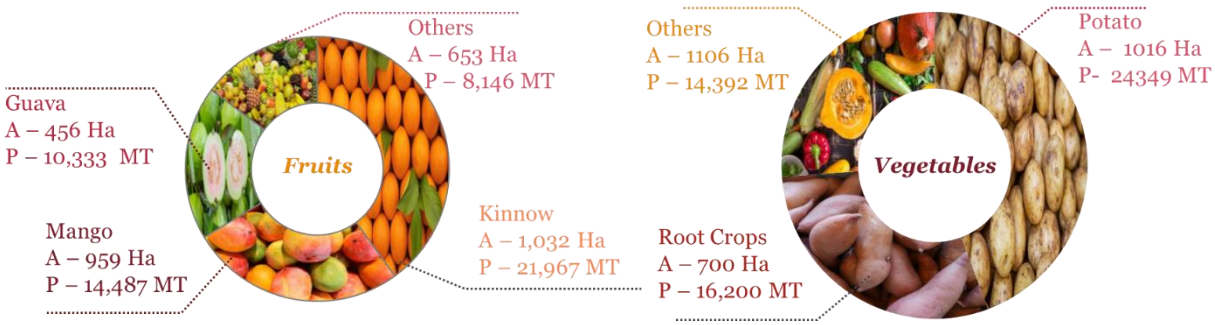


Graph 25: Production trend in agricultural crops in Rupnagar district (MT)

Source: Department of Agriculture, Govt. of Punjab

4.3.5. Horticulture profile

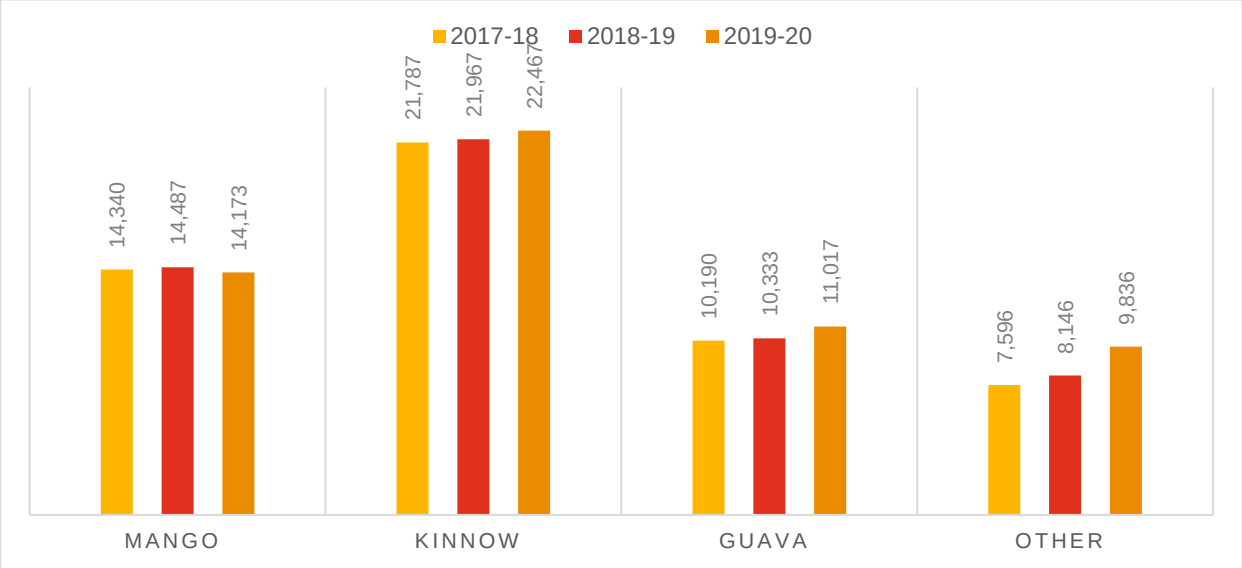
The district produces a variety of fruits viz. mango, guava, sweet orange, litchi, lime lemon, kinnow, peach, amla, etc. The district produces a wide range of vegetables like cauliflower, potato, peas, root crops, etc. among the vegetables, area under potato is maximum.



Graph 26: Major fruits and vegetables grown in the district Rupnagar (2018-19)

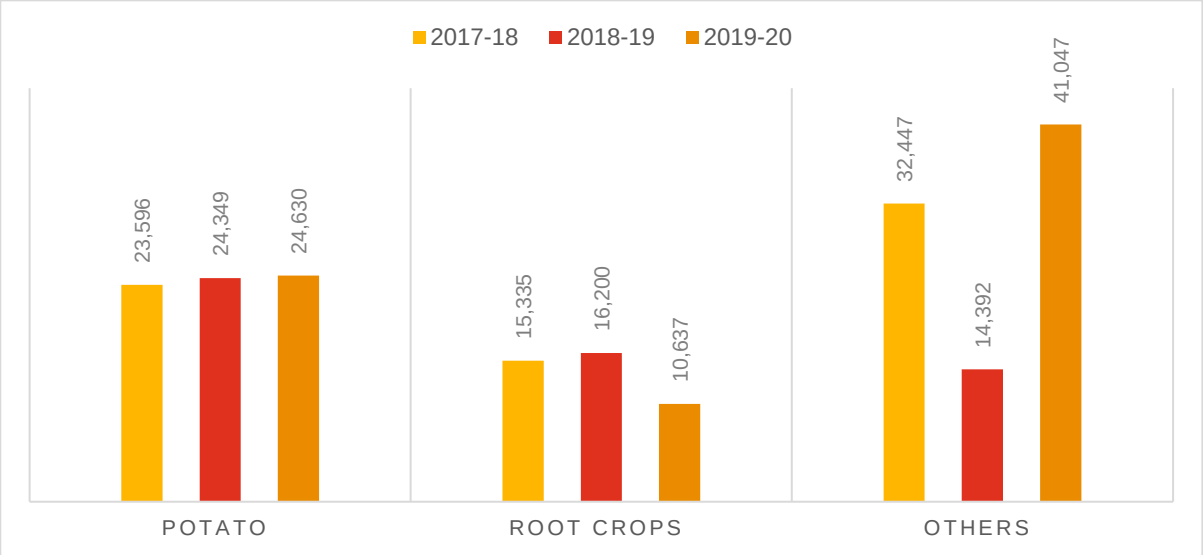
Production trend-Fruits

The district reported a cumulative growth of nearly 7% in area under fruit crops in last three years i.e. from 2017-18 to 2019-20. Production of Kinnow has shown 3% increase in production in last three years. Production of Kinnow stood at 22,467 MT in 2019.Other important fruit crops grown in the district are Sweet orange, lime, litchi etc. The district produced 971 MT and 967 MT of sweet orange and lime respectively in 2019-20.



Production trend-Vegetables

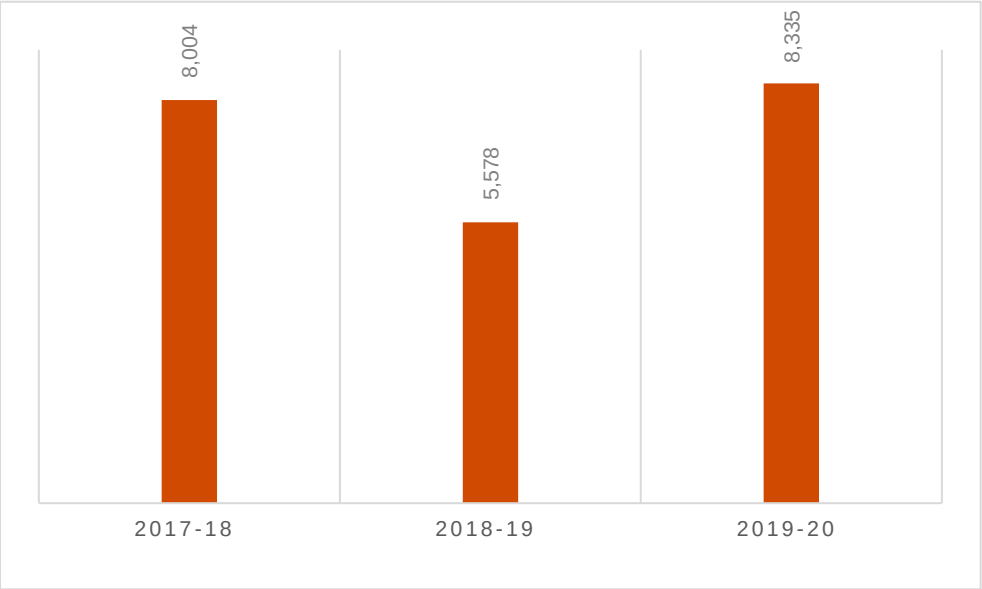
Potato occupies highest area among all the vegetable crops in the district. Production of Potato has shown 4% growth rate in last three years. Cumulative growth in vegetable production in the state was 7% in the last three years.



Graph 27: Production trend of vegetables in Rupnagar (MT)

4.3.6. Allied activities profile

Production trend-Fish

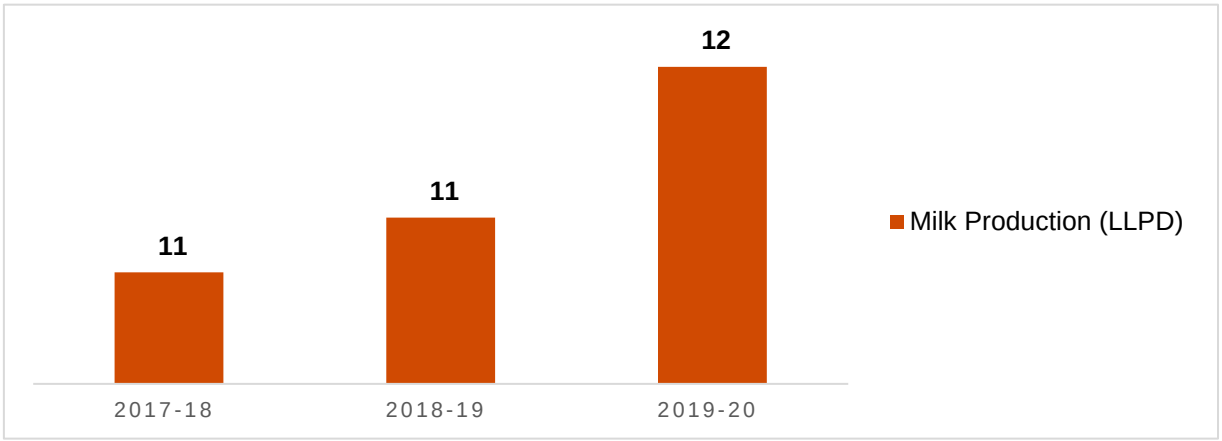


Graph 28: Production trend of fish in Rupnagar (MT)

Fish production in the district has shown erratic behavior in the district over last three years. In 2019-20, fish production in the district was 8335 MT.

Production trend-Milk

The district reported consistent growth in the production of milk in last three years with 11.67 lakh litre/day during 2019-20. From the graph it is evident that there has been gradual increase in production of milk in the district.



Graph 29: Production trend of milk in Rupnagar district (LLPD)

4.3.7. Industrial profile

There are 1888 registered Micro Small enterprises in the district and 1 registered medium and large enterprises providing employment to 11311 and 2274 persons respectively, as per FY 2014-15. There is one industrial areas in the district.

Table 7: List of Industries in Rupnagar (2014-15)

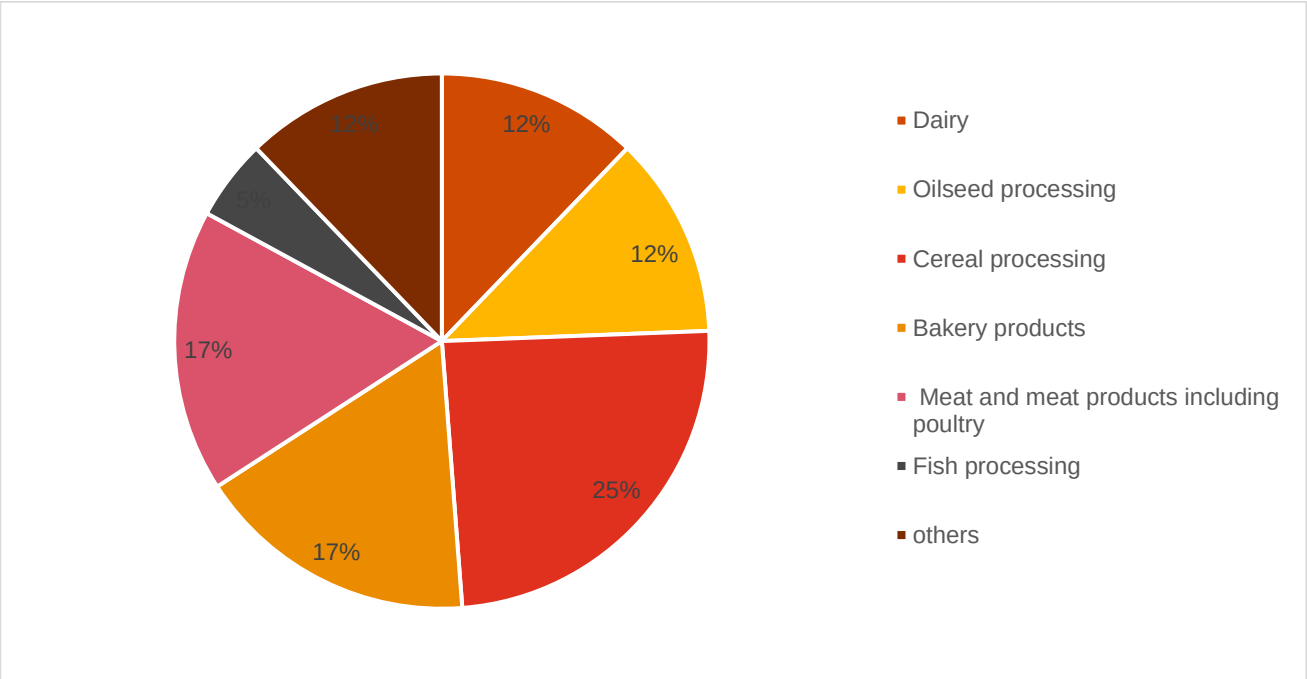
Industry at a Glance (2014-15)

Sr. No.	Head	Unit	Particulars
1	Registered Micro & Small Units	No.	1888
2	Registered Medium & Large Units	No.	1
3	Employment in MSE Sector	No.	11311
4	Employment in Large and Medium Industries	No.	2274
5	No. of Industrial Areas	No.	1
6	Turnover of MSE Sector	Rs. Lakh	80541.55
7	Turnover of Large & Medium Sector	Rs. Lakh	299139.89

Source: District Industries Centre, Rupnagar

There are over **500+ rice mills,400 bakery, over 1200 attachakkis, more than 10 roller flour mills** the district.

There are number of micro enterprises/FPOs/SHGs engaged in the production of a range of products like jaggery, pickles, chutney, jam, squash etc.



Graph 30:Spread of micro food processing units in Rupnagar

4.3.8. ODOP

Yet to be decided.

Based on the baseline study conducted by the SNA Mango was selected as ODOP but after detailed discussion with different stakeholders it was decided to change the ODOP to citrus fruit. The options are still being evaluated for the district.

4.4. SAS Nagar (Mohali)

4.4.1. Socio economic profile

The district SAS Nagar (Mohali) is located in the North East part of Punjab. The district head quarter SAS Nagar (Mohali) is adjacent to the state capital Chandigarh. The SAS Nagar is a satellite city of Chandigarh. The district was formed on 14th April 2006. It is bounded by Patiala and Fatehgrah Sahib districts in the south-west, Ropar district in the northwest, Chandigarh U.T. and Panchkula district in the east and Ambala district of Haryana state in the south. Because of its connectivity with the union territory of Chandigarh, the district has been formed to achieve growth of development as this area is emerging as major I.T.hub of Northern India

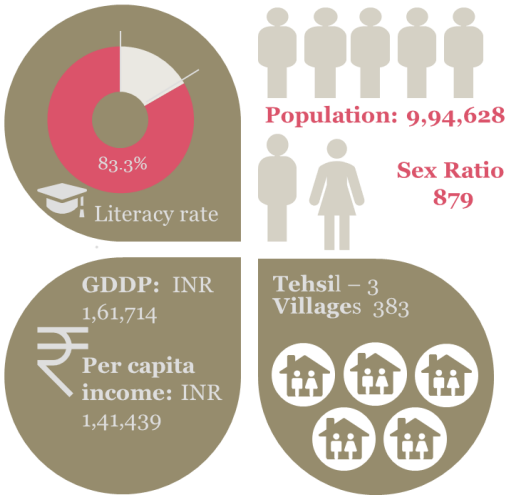
The district is divided into three tehsils namely; Dera Bassi, Kharar and SAS Nagar. The important townships in the district are Kharar, Kurali, Mohali, Zirakpur, DeraBassi and Banur.

The Gross District Domestic Product (GDDP) and per capita income of the district at current prices was third highest amongst all the districts.

4.4.2. Demographic profile

According to 2011 Census, S.A.S.Nagar district has a population of 9,94,628 comprising 53.12% males and 46.78% females. In the district, 45.24% persons resides in rural and 54.76% in urban areas. The district includes 383 villages.

The district has a population density of 909 persons per sq. km which is significantly higher than that of the state (551) and ranks 3rd among the districts in the state. The district has a sex ratio of 879 females for every 1000 males. The literacy rate of the district is 83.8% and ranks second in the state.



4.4.3. Climate and Rainfall

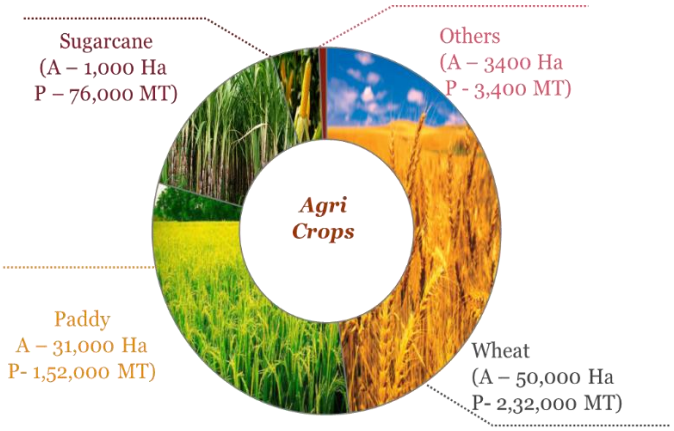
The climate of the district is classified as tropical steppe, semi-arid and hot which is mainly dry except in rainy months and characterized by intensely hot summer and cold winter. The temperature may touch 45^0C or more in summers, on some days. Hot winds blow during summer, occasionally accompanied by dust storms. Generally, pre-monsoon showers are experienced in the middle or end of June which may bring down temperature considerably. The average annual rainfall is 617 mm, and Normal Annual rainfall is 1061 respectively.

4.4.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is about 64%. The district ahs the cropping intensity of over 137% which is lowest amongst all districts. Wheat and Paddy constitute the main Rabi and Kharif crops. The major plantation crop of the district is Sugarcane.

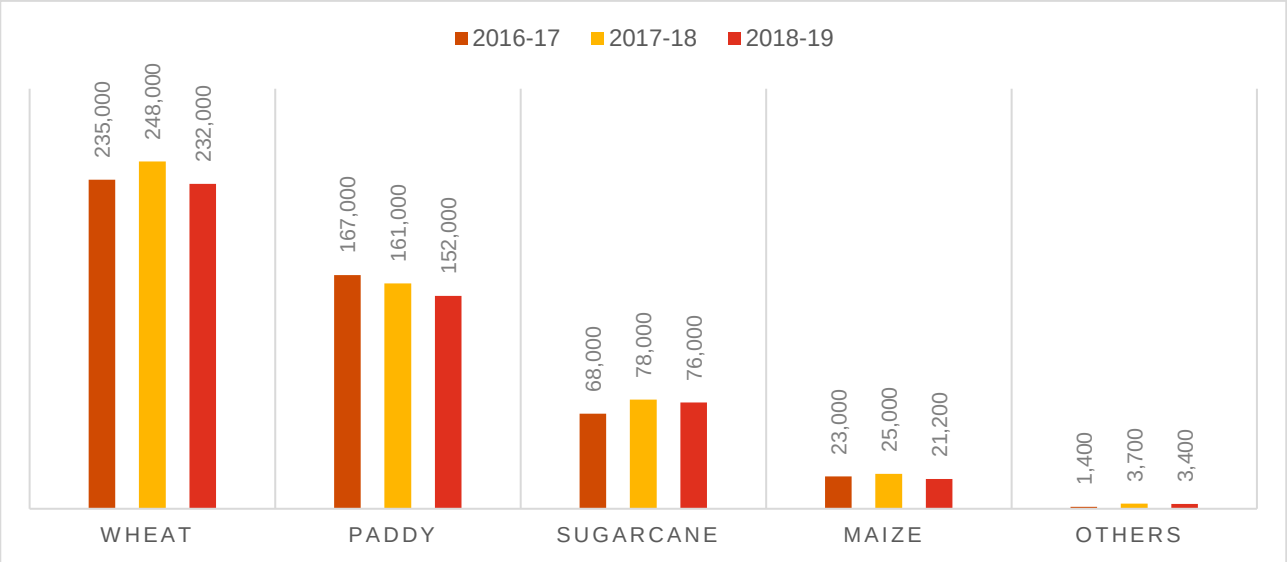
Production trends-Agriculture crops

There has been nearly no change in the area under these crops for the past three years. The district also grew maize in 5,700 Hectare (21,200 MT) in 2018-19. Production of field crops has shown erratic trends over last three years.



Graph 31: Major Field crops grown in the district SAS Nagar, (2018-19)

Source: Department of Agriculture, Govt. of Punjab



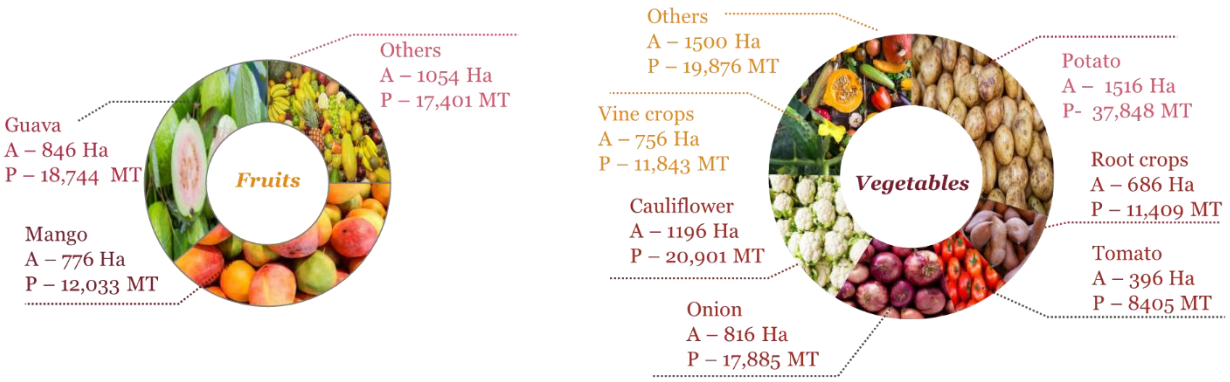
Graph 32: Production trends of agricultural crops in SAS nagar district

Source: Department of Agriculture, Govt. of Punjab

4.4.5. Horticulture profile

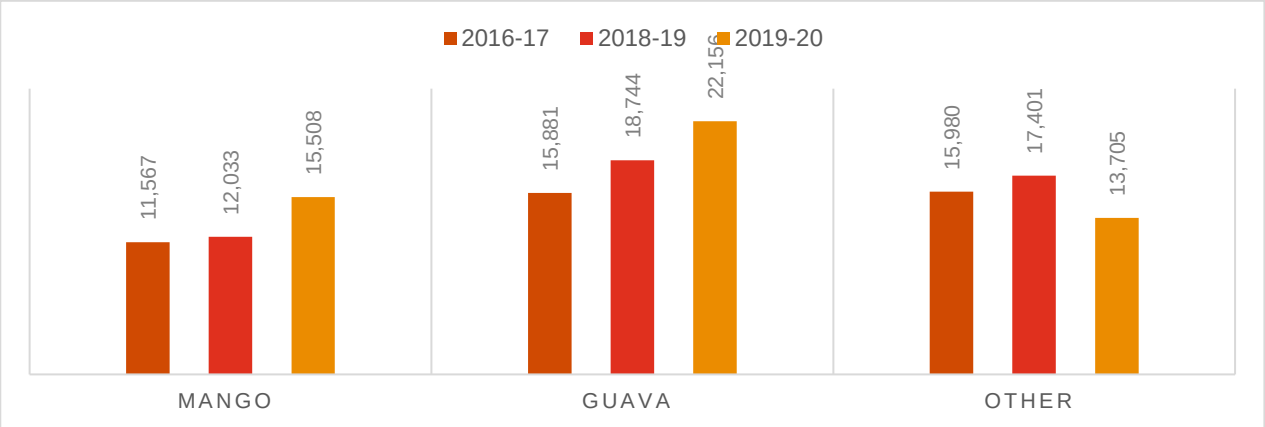
The district also produces a wide range of vegetables like onion, cabbage, tomato, chilies vine crops & root crops cauliflower, potato, peas, root crops, etc. there has been an overall cumulative growth of about 20% in area under vegetables in last three years i.e. from 2016-17 to 2018-19. Among the vegetables, area under potato is maximum.

The district produces a variety of fruits viz. guava, mango, lime lemon, kinnow, peach etc. The district reported a cumulative growth of over 10% in area under fruit crops in last three years i.e. from 2016-17 to 2018-19. The maximum area is under guava.

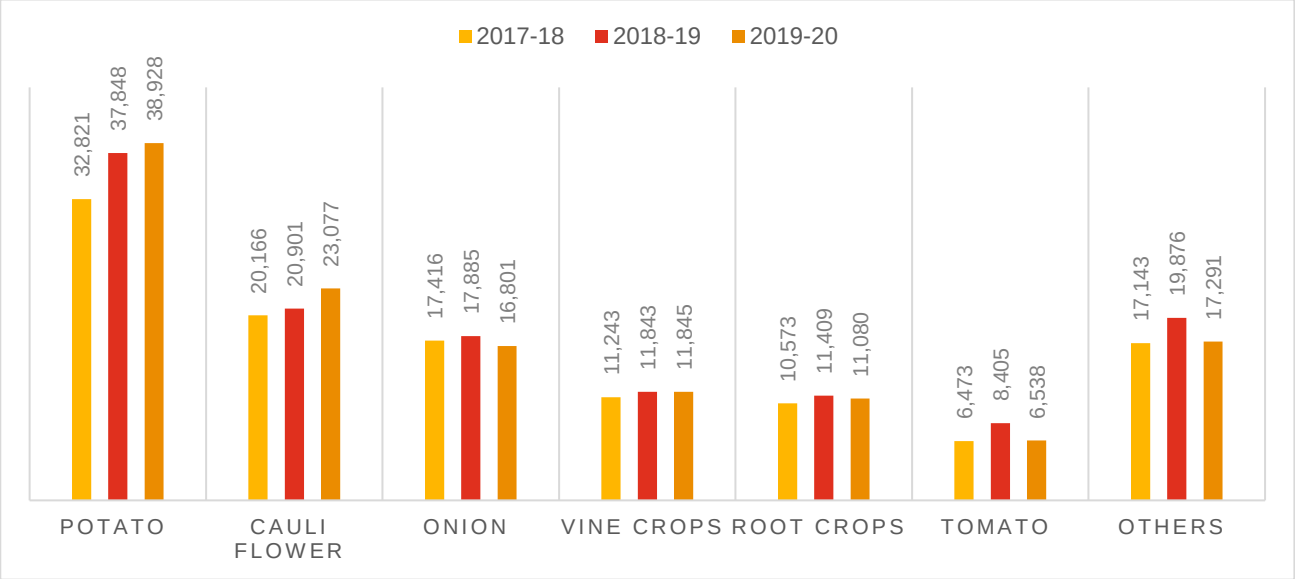


Graph 33: Major fruits and vegetables grown in the district SAS Nagar, (2018-19)

Most of the fruit and vegetable crops have shown an **increasing trend of growth of production** over the years like mango, guava, potato, and cauliflower. For other F&V the production trend has been slightly erratic. For both mango and guava fruit crops, the production in 2019-20 has increased from previous years by more than 30%.



Graph 34: Production trend of fruit crops in SAS nagar district

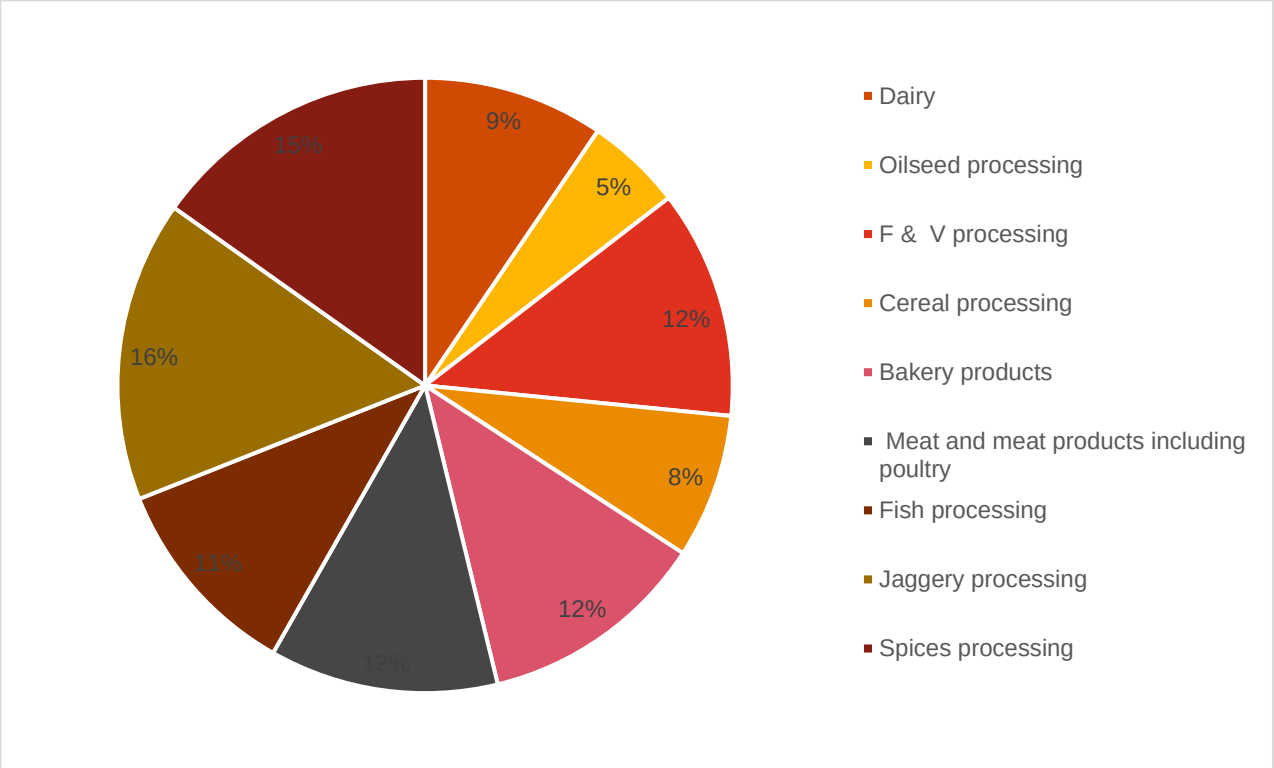


Graph 35:Production trend of vegetables in SAS Nagar (MT)

4.4.6. Industrial profile

In the districts there are two roller flour mills manufacturing non-branded atta, 6-7 mini semi-automatic chakkis, 300 small chakkis.

The district has no fruits and vegetable processing plant in the organized sector. There are many cottage units manufacturing pickle, murraba, chutney etc.



Major food processing enterprises in the district are as follows;

- The Ropar District Co-operative Milk Producer's Union Limited, Mohali: The unit is having an installed capacity of 5 LLPD. It procures milk from villages of entire Ropar and Mohali districts and part of Fatehgarh Saheb and Patiala districts. Around 1160 functional milk producer co-operative societies are associated with the union.

4.4.7. ODOP

Sugarcane processing is the ODOP for the district. The detail description of the ODOP is covered in another district.

4.4.8. Non- ODOP

As the district is close to urban centres like Punchkula and Chandigarh opportunities for products like bakery and milk value added products have great potential. The urban population prefer consumer products. About 12% of the total micro food enterprises in the district are bakery units and 9% are dairy based units

4.5. Sri Muktsar Sahib

4.5.1. Socio economic profile

Muktsar district lies in the south western part of the state. The district shares its boundary with Faridkot district in north and north east, in North West and eastern side with Ferozpur district. On the east, it is bounded by Bathinda district of Punjab. The area has no river and is covered extensively by the canal network of Sirhind feeder canal to meet the irrigation and drinking water needs of the people.

Muktsar district is a historical city. It is intimately connected with Sikh religion. Guru Gobind Singh Ji, fought his last battle against Mughals in 1705 A.D. at Muktsar. During fighting, 40 disciples of Guru Ji known as '40 Mukte' (40 liberated ones) sacrificed their lives

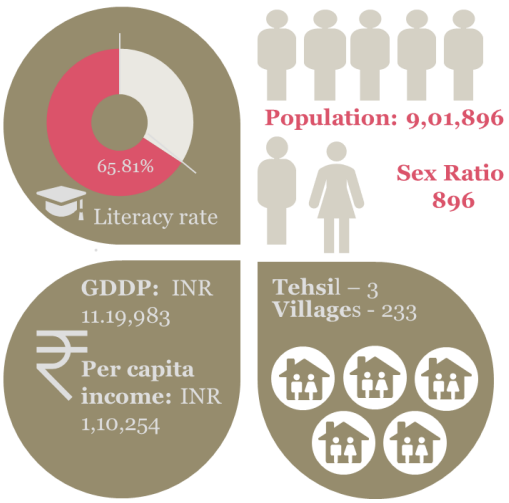
Muktsar City is the district headquarters and the district are comprising three tehsils namely of Sri Muktsar Sahib, Gidderbaha and Malout. The district has four blocks namely Kotbhai, Lambi, Malout and Sri muktsar sahib.

The district Gross District Domestic Product (GDDP) and per capita income is much below then the state average.

4.5.2. Demographic profile

According to 2011 Census, Sri Muktsar Sahib district has a population of 901,896 comprising 52.73% males and 47.26% females. This makes 3.3 % of State's population. In the district, 72% persons resides in rural and 28% in urban areas. The district includes 233 villages.

The district has a population density of 348 persons per sq. km which is significantly lower than that of the state (551) and ranks 20th among the districts in the state. The district has a sex ratio of 896 females for every 1000 males. The literacy rate of the district is 65.81% .



4.5.3. Climate and Rainfall

The climate of the district is sub- tropical steppe, semi-arid and hot which is mainly dry except in rainy months and characterized by intensely hot summer and cold winter. The western himalayas in the north and the thar desert in the south and southwest mainly determine the climate conditions. The normal annual rainfall of the area is 430.7mm. In summer the maximum temperature may touch 45^0C and in winter, the minimum temperature may dip as low as 1^0C – 4^0C on some days.

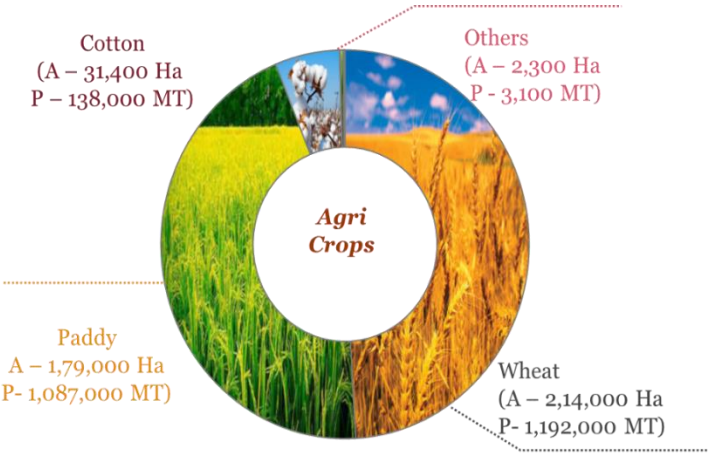
4.5.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is about 85%. The district has the cropping intensity of over 202% which is third highest after districts Kapurthala and Barnala.

The main crops grown during kharif are cotton and paddy and wheat in Rabi.

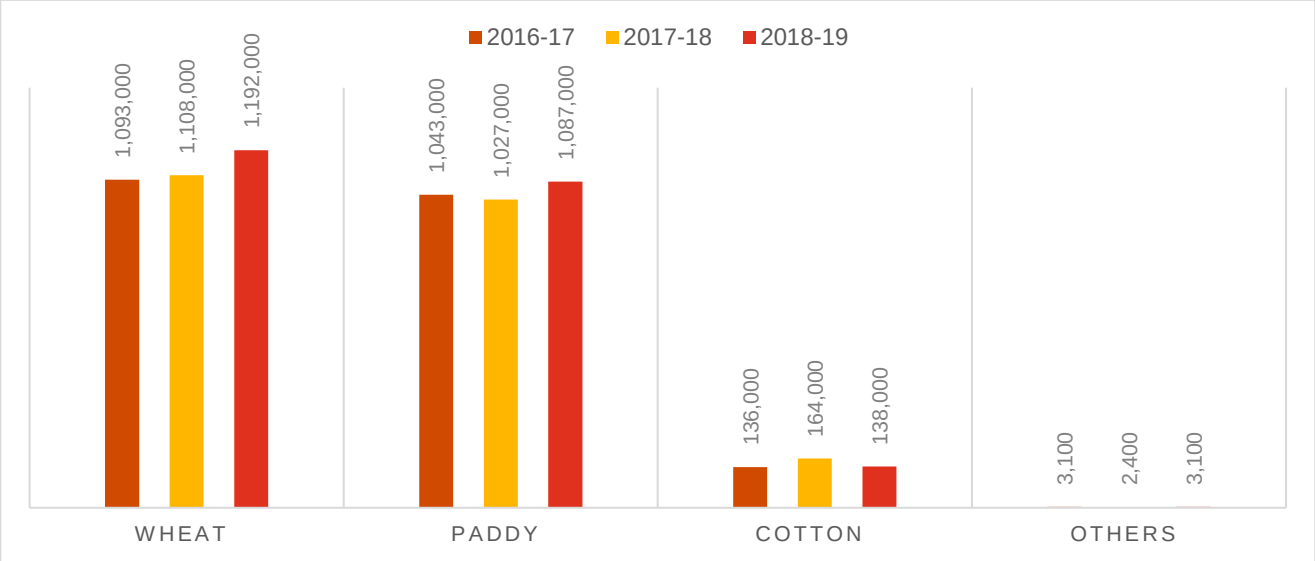
Production trends-Agricultural crops

Production of wheat and paddy has increased over last year. Production of cotton was erratic over last three years.



Graph 36: Major Field crops grown in district Sri Muktsar Sahib (2018-19)

Source: Department of Agriculture, Govt. of Punjab

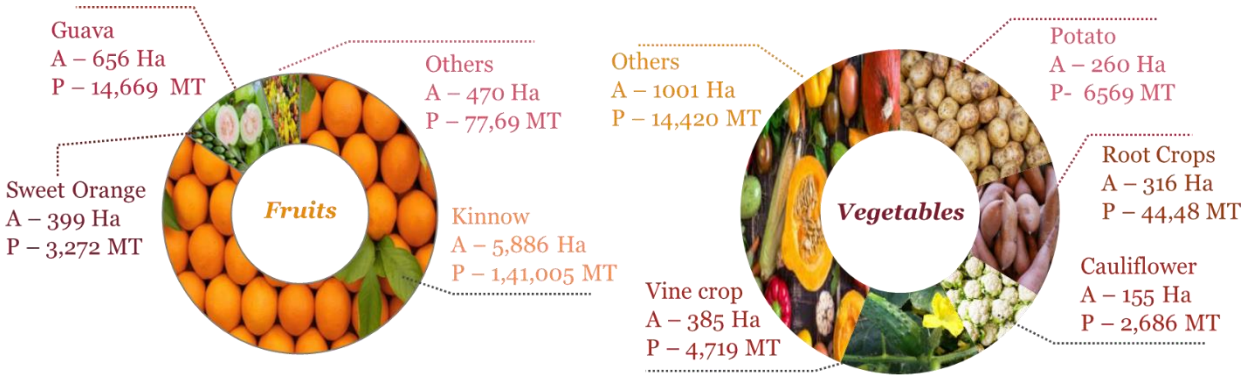


Graph 37: Production trends of agricultural crops in Sri Muktsar Sahib districts (MT)

Source: Department of Agriculture, Govt. of Punjab

4.5.5. Horticulture profile

The district also produces a wide range of vegetables like vine crops, root crops, potato, brinjal, cauliflower, peas, garlic, okra etc. Out of all vegetables, maximum area is under vine crops and that has recorded a spectacular cumulative growth of 71% in last three years. The second highest area is under root crop with 18% growth in last three years.

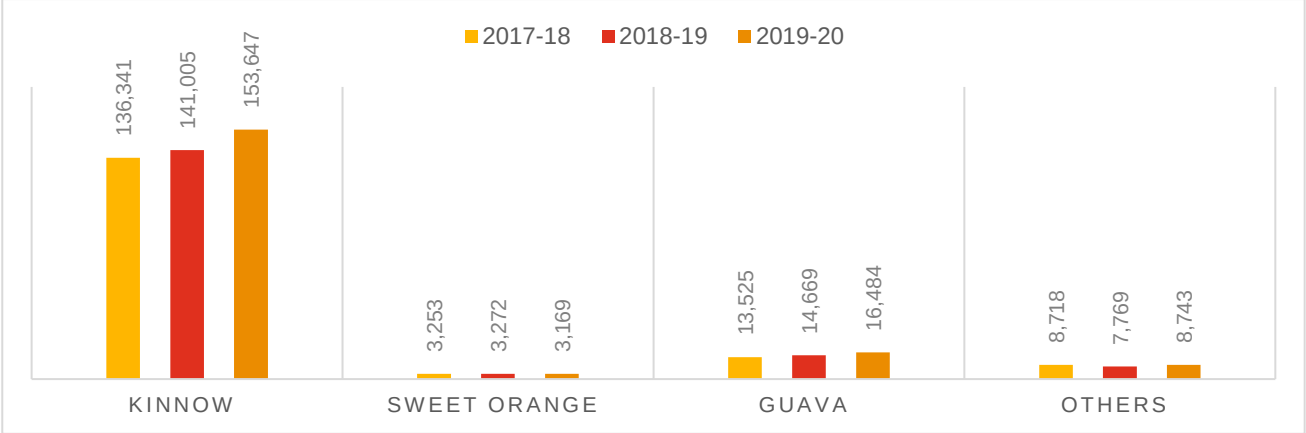


Graph 38: Major fruits and vegetables grown in the district Sri Muktsar Sahib, (2018-19)

The district produces a wide range of fruits like kinnow, guava, sweet orange, peach, ber, etc. It is the second highest producer of Kinnow and Peach and tops in area and production of sweet orange.

Production trends-Fruits

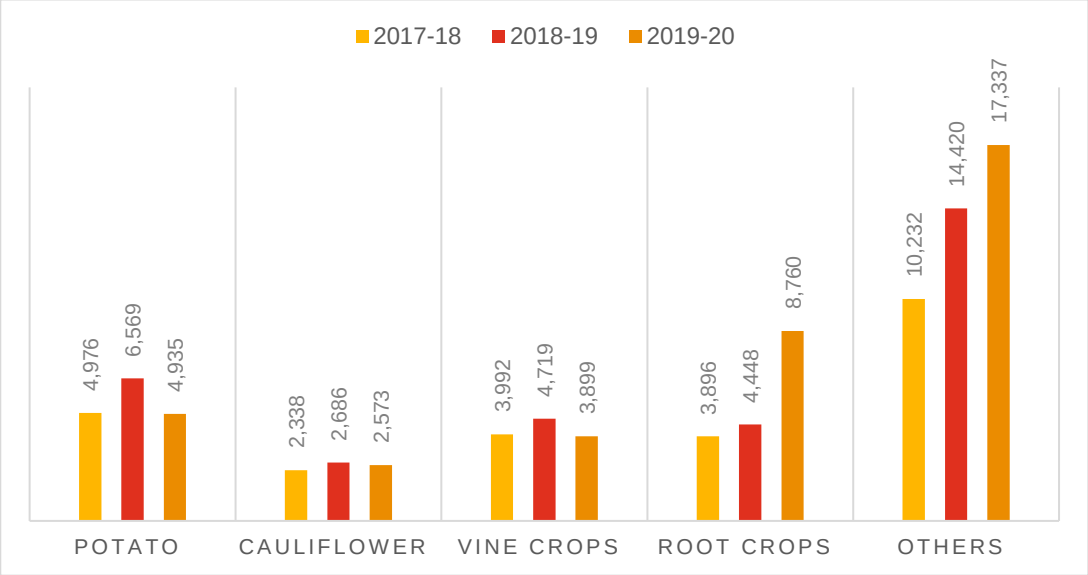
Production of Kinnow and Guava has seen an increasing trend over last three years, however production of sweet orange has shown decrease in production in 2019-20 in comparison to 2018-19.



Graph 39:Production trends of fruit crops in Sri Mukatsar Sahib district (MT)

Production trends-Vegetables

From the graph it is evident that production of root crops has increased significantly over the years. However production of potato and vine crops has shown erratic trends in production in last three years.

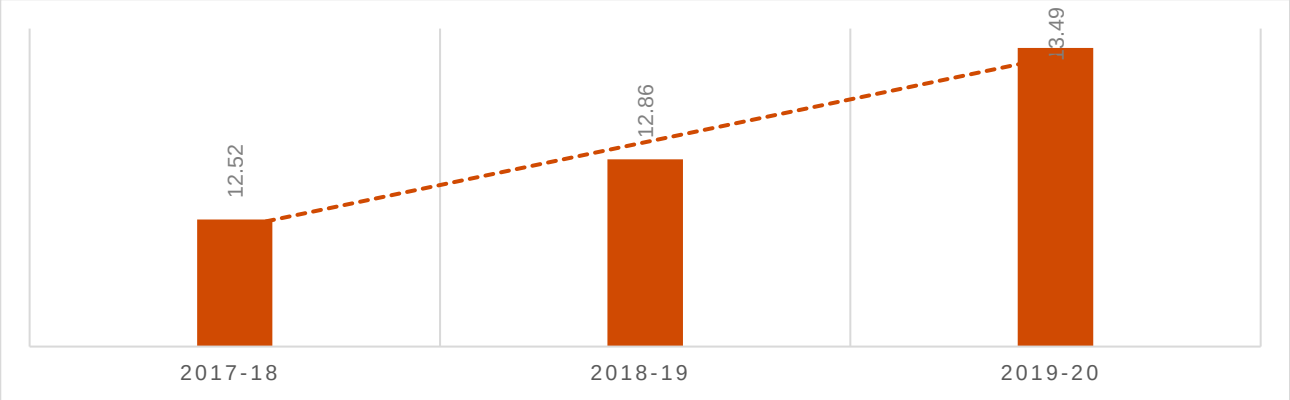


Graph 40:Production trend of vegetables crops in Sri Mukatsar Sahib district (MT)

4.5.6. Allied activities profile

Production trend-Milk

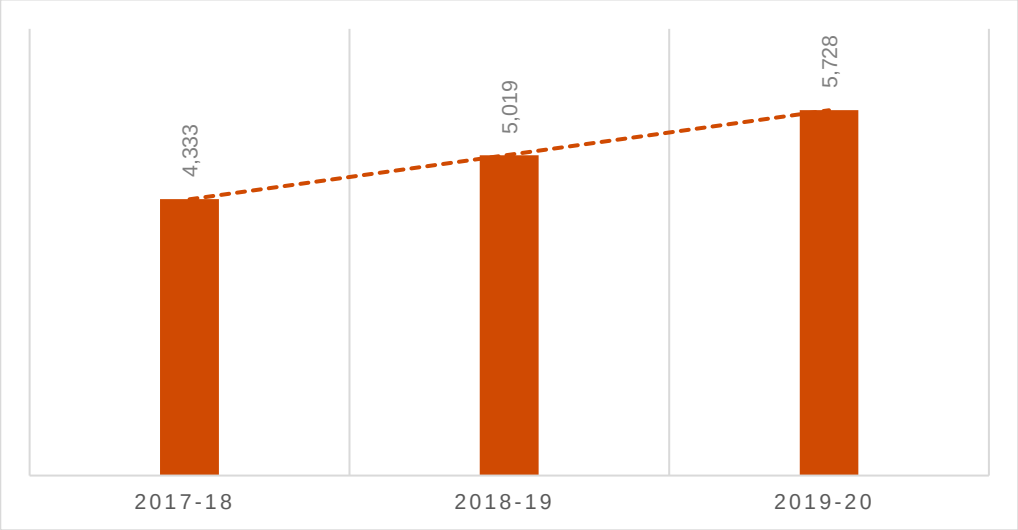
Milk production in the district has increased from 12.52 LLPD in 2017-18 to 13.49 LLPD in 2019-20. This increasing trend in production increases avenues for processing.



Graph 41: Production trend of Milk in Sri Mukatsar Sahib district (LLPD)

Production trend – Fish

Fish Farming is very prevalent in Muktsar district. Over the years a good number of farmers have shifted to fish farming for both Indian Major Carp (IMC) and Shrimp (Jhinga). Fish production in the district has increased by 32% from 2017-18 to 2019-20. At present, area under IMC is between 400 to 500 acres whereas 100 to 150 acres under Shrimp. IMC (Mrigal, Rohu, Katla etc. varieties of fish) grow in fresh water (canal) and Shrimp in saline water.

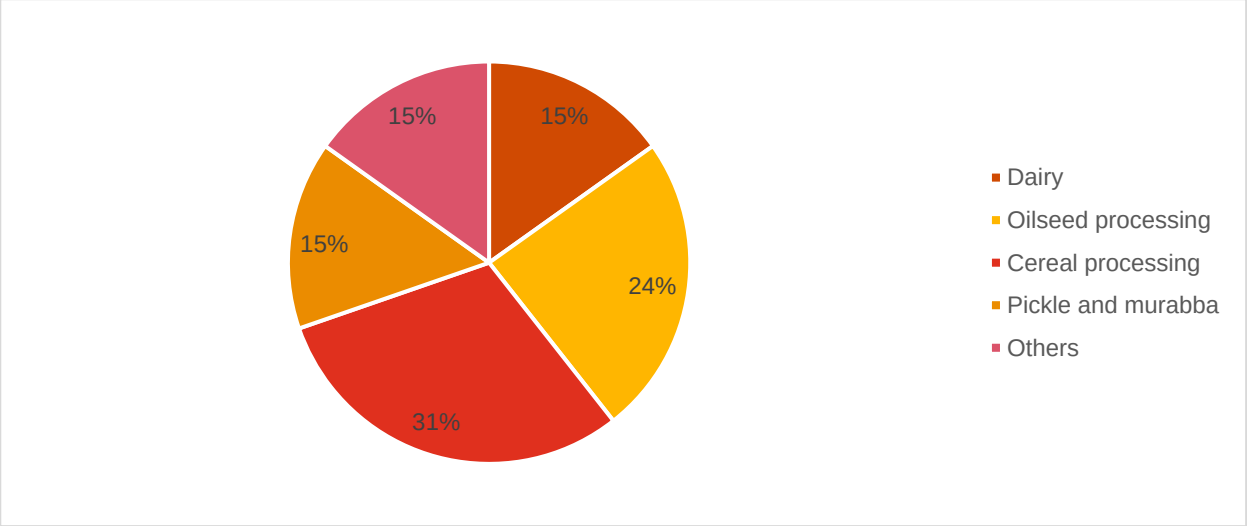


Graph 42: Production trend of Fish in Sri Mukatsar Sahib district (MT)

4.5.7. Industrial profile

Being a leading cotton producing district, there are cotton ginning & pressing and yarn manufacturing mills. There are about 20 cotton seed oil expelling units, one medium sized integrated unit of paddy shelling, solvent extraction of oil (from cotton & rice bran) and refining of edible oil and 6 papad making cottage units.

The district has about 300 bakeries and 90% of them use brick kilns for manufacturing products.



Graph 43: Spread of micro food enterprises in Sri Muktsar district

4.5.8. ODOP

Milk and Milk products has been selected as ODOP of the district.

The district produces about 13.5 lakh litre per day of milk and the same is increasing year after year. There is no good sized milk processing plant in the district. However, Verka, Nestle, Chanakya Dairy and others have installed their 'Bulk Milk Chillers' for collection of milk for processing in their respective plants. The farmer generally gives their milk to the cooperative societies formed at the village level by Verka.

4.5.9. Non ODOP

Sri Muktsar Sahib has potential for fish farming in waterlogged areas. Around 50 farmers are already engaged in fish farming in the district. These farmers are earning Rs.4.00 lakh per acre annually and State Govt. is giving 50% subsidy to men and 60% subsidy to females. Fisheries production in the district is 15673 MT. Processing of fisheries is a potential in the district.

Poultry production in the district is 40877 MT, this gives a potential of processing of poultry and setting up of feed units. There are good number of poultry farms both broiler and commercial. There is no slaughter-house in the district. There are many individuals/shops engaged in manual culling and supplying of daily fresh meat to consumers. There is a need to up-grade their facilities.

4.6. Fazilka

4.6.1. Socio economic profile

District Fazilka is located in South-Western Punjab, about 325 km west of Chandigarh. It was announced as the 21st district of Punjab in July 2011. Earlier, it was part of the Firozpur district. Fazilka is near the India-Pakistan border which is 11 km away.

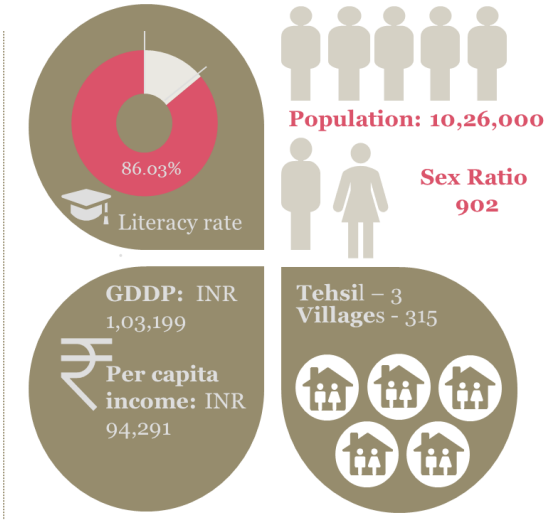
Fazilka is the district headquarter and the district is divided into 3 tehsils namely; Fazilka, Abhor and Jalalabad. There are 315 villages in the district and 74% of the population resides in rural area and balance in urban areas

The district Gross District Domestic Product (GDDP) and per capita income, at current price is much below than the state average.

4.6.2. Demographic profile

According to 2011 Census, the district has a population of 10,26,000 persons. In the district, 74% of the population resides in rural and 26% in urban areas. The district comprises of 315 villages.

The district has a sex ratio of 902 females for every 1000 males. The literacy rate of the district is 86.03%. The sex ratio and literacy rate of the district is higher than the state average.



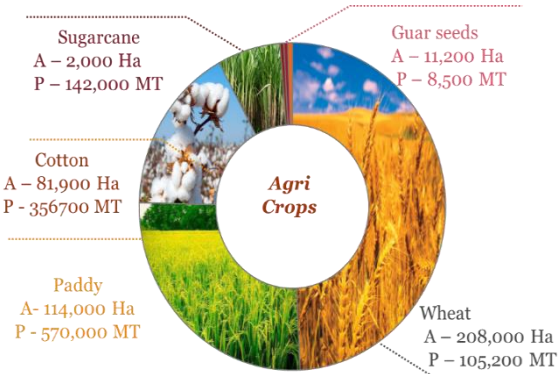
4.6.3. Climate and Rainfall

The climate of the district can be classified as tropical desert, arid and hot. The climate on the whole is dry and characterized by very hot summer, a short rainy season, and a bracing winter. June is generally the hottest month with the maximum temperature may reach about 47^0C. The minimum temperature may reach to freezing point in January. The monsoon begins from the month of July. The area receives about 389 mm annual normal rainfalls.

4.6.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is about 88%. The district has the cropping intensity of over 186%.

The main crops grown during kharif are cotton and paddy and wheat in Rabi. the other crops grown in the area are Maize, Mustard, Sugarcane, Bajra, Guar seeds, Gram, Barley etc. The district tops in the production of guara seed amongst all district of the state

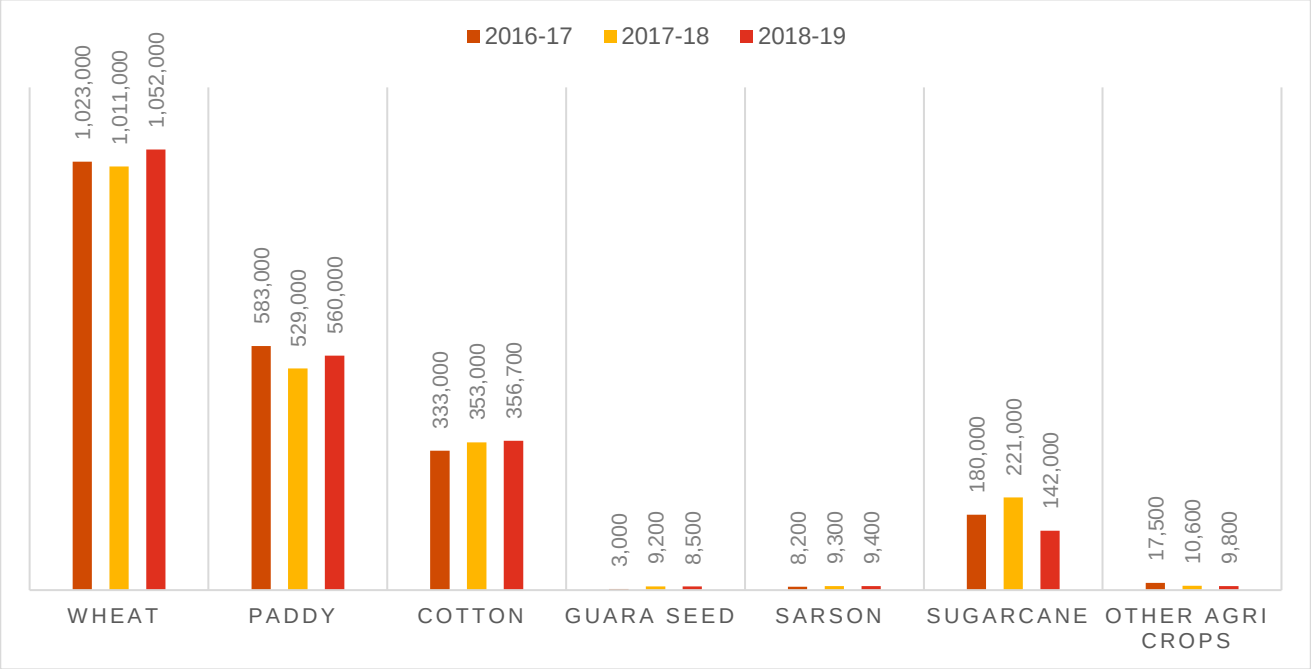


Graph 44: Major Field crops grown in district Fazilka, (2018-19)

Source: Department of Agriculture, Govt. of Punjab

<u>Production trends-Agricultural crops</u>

Production of wheat and cotton has increased from 2016-17 to 2018-19. However, production of sugarcane and paddy has been erratic over last three years.



Graph 45: Production Trends of Agricultural crops in Fazilka district (MT)

Source: Department of Agriculture, Govt. of Punjab

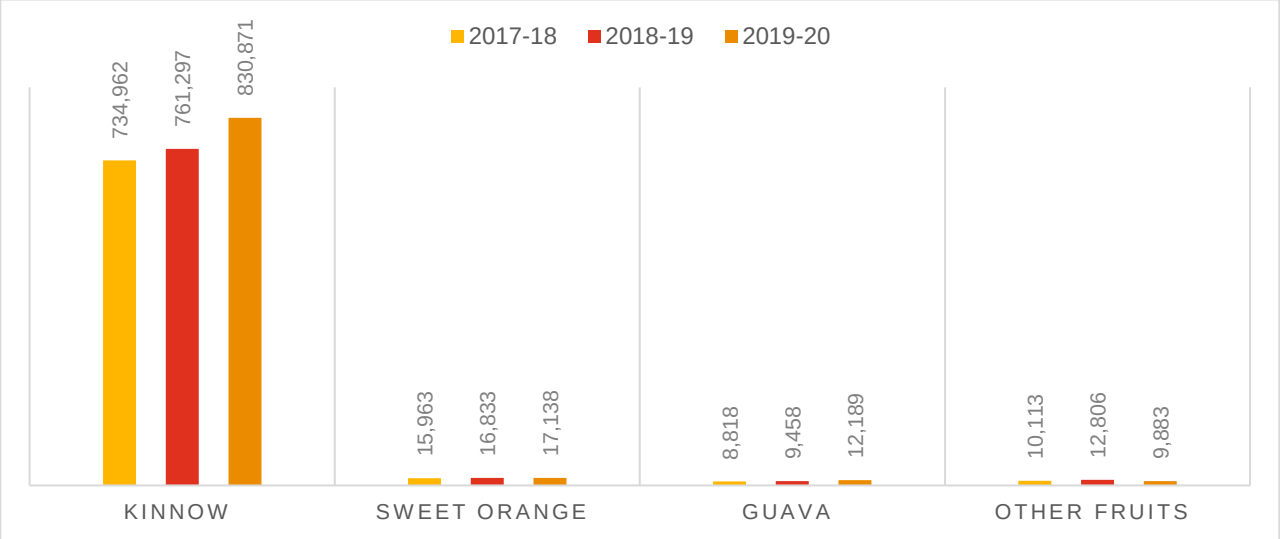
4.6.5. Horticulture profile

The district also produces a wide range of vegetables like vine crops, root crops, potato, brinjal, cauliflower, peas, garlic, onion etc. Out of all vegetables, maximum area is under root crops (mainly carrot).

Graph 46: Major fruits and vegetables grown in the district Fazilka (2018-19)

Fazilka district falls in the irrigated zone of Punjab State. Major fruit grown is Kinnow, with average productivity of 22.4 MT/hectare, the total production of Kinnow in the district is 7,75,195 MT in 2018-19. Progressive Farmers of this district are producing Kinnow of high standards which is being exported to different countries. The district tops in the production of Kinnow and sweet orange amongst all districts of the state.

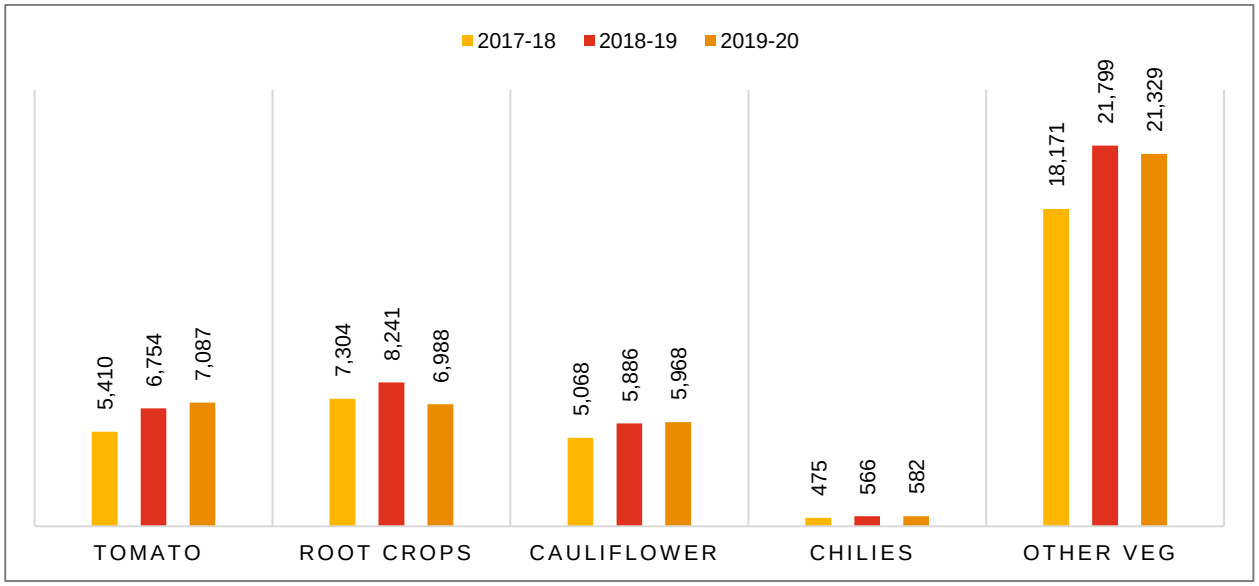
Production trend of fruits and vegetables over last few years is depicted with the help of the graphs below:



Graph 47: Production trend of fruit crops in Fazilka district (MT)

It can be observed from the above graph that production of kinnow, sweet orange and guava has shown an increasing growth trend in the last few years from 2017-18 to 2019-20 for all fruits. For all other fruits, the trend has seen slightly erratic with a 26.6% increase from 2017-18 to 2018-19 and then a 22.8% decrease henceforth in the subsequent year.

In the case of vegetables, the production has increased over the years from 2017-18 to 2019-20 for tomato, cauliflower, chilies, and other vegetables.

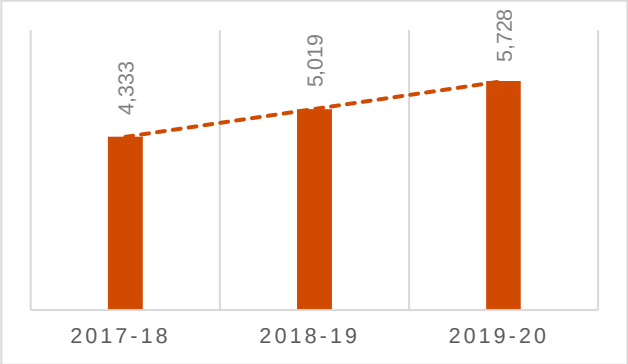


Graph 5: Production trend of vegetable crops in Fazilka district (MT)

4.6.6. Allied activities profile

Production Trends-Fish

The district produces both IMC varieties of fish and Shrimp. The IMC varieties go to Bathinda and Ludhiana markets for auction whereas Shrimp is taken by traders from South for processing and export to China, USA etc.

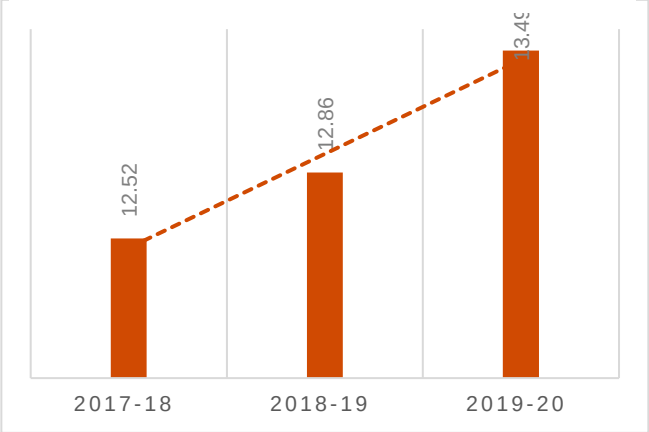


Graph 48: Production trends of fish in Fazilka district (MT)

Source: Fisheries Department, Punjab

Production Trends-Milk

The production of milk has been growing over the years with 12 lakh liter/day during 2019-20. There are many processors manufacturing paneer, curd, milk, khoya, cream etc.



Graph 49: Production trends of milk in Fazilka district (LLPD)

Source: Directorate of Dairy Development, Punjab

4.6.7. Industrial profile

There are 1221 registered Micro Small enterprises in the district and 7 registered medium and large enterprises providing employment to 10586 and 881 persons respectively, as per FY 2014-15. There are no industrial areas in the district.

Table 8: Industry in Fazilka in 2014-15

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	1221
2	Registered Medium & Large Units	No.	7
3	Employment in MSE Sector	No.	10586
4	Employment in Large and Medium Industries	No.	881
5	No. of Industrial Areas	No.	-
6	Turnover of MSE Sector	Rs. Lakh	603672
7	Turnover of Large & Medium Sector	Rs. Lakh	68478.42

Table 9: Details of existing micro & small enterprises in the district Fazilka (2014 -15)

NIC Code Types	Types of Industry	Units (No.)	Employment (No.)	Investment (Rs. Lakh)	Production (Rs. Lakh)

15	Mfg. of Food Products Beverages	352	5553	13044	584921
18	Mfg. of Wearing Apparels	3	44	9	165
19	Leather & Leather products	85	151	37	420
20	Mfg. of wood products	57	222	172	1480
21	Mfg. of paper & paper products	8	132	111	730
22	Printing / publishing	32	76	32	750
24	Chemicals & chemical products	23	139	140	1840
25	Rubber & plastic products	7	36	41	345
26	Other Non Metallic products	79	1843	526	3875
27	Basic metals	1	8	1	1
28	Fabricated metal products	207	1339	675	4435
29	Machinery& equipment	7	43	16	710
30	Off, account & computing machinery	1	3	1	50
31	Electrical machinery & apparatus	19	76	43	680
36	Mfg. of furtniture mgf. NEC	64	253	49	1040
50	Maintenance & repair of motor veh.	34	97	26	330
52	Maintenance & repair household	236	554	104	1360
63	Cold storage	3	9	103	400
72	Computer & relating activities	2	5	3	60
85	Health & social work	1	3	5	80
	Grand Total	**1221**	**10586**	**15138**	**603672**

Source: Brief Industrial Profile of District Gurdaspur, MSME Development Institute, Ministry of MSME, GOI

There are over 100 mini rice mills of average capacity 2 MT/hr, more than 5 solvent extraction plants processing cotton seed, rice brand and mustard seed etc into edible oil, about 150 bakery units in the district.

Rice Mills and Sortex units are situated at Jalalabad and Fazilka blocks and Kinnow waxing units and cotton mills in Abohar block. Rice from Jalalabad is being exported to gulf countries and Kinnow to neighboring countries.

PAIC has set a large sized multi fruits and vegetable processing unit in Abohar. There are over 80 waxing & grading units in the district mainly owned by growers for distant marketing and export of kinnow. Micro food processing enterprises are involved in primary processing of Kinnow currently. Many farmers get the produce processed at the primary processing facilities in the nearby vicinity at service charge basis. List of units interacted with during the visit has been annexed.

There is an ample scope of value addition of KInnow in the district. Products like juices, squash, jam and jellies can be manufactured.

4.6.8. ODOP: Kinnow

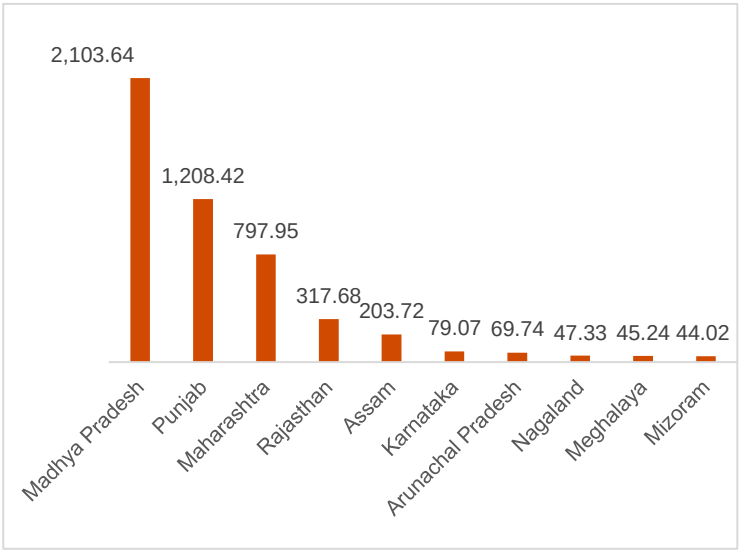
Kinnow is selected as ODOP for Fazilka district. Citrus has a wonderful cultural and socio-economic impact on the whole society. The importance of citrus fruits in the world's economy is demonstrated by its wide scale cultivation under tropical and sub-tropical conditions. The nutritional and medicinal values of the fruits make it crucial in several parts of the world. Citrus is primarily valued for the fruits, which is either eaten alone as fresh fruit, processed into juice, or added to dishes and beverages.

Kinnow mandarin which is one of the important fruits of citrus family, its juice has many health benefits, it is antispasmodic, sedative, digestive, anti-carcinogenic, anti-inflammatory, and anti-allergic therefore has a high therapeutic value. Every part of the fruit is of high nutritional and medicinal importance; therefore, it is also known as 'Health Capsule'. The juice of kinnow is widely consumed fruit juice by normal as well as sick people and is

well known for its instant energy, pectin, vitamin C and potassium content. Kinnow juice is refreshing after any hectic activity or on a dry, hot day to quench thirst. The inherited abiotic stress tolerance in kinnow came from its mother parent, king mandarin make this tropical fruit suitable for sub-tropical region too.

National Clusters

In the recent years, Kinnow had gained popularity. The area under cultivation of Mandarin (Kinnow, Mandarin orange and orange) increasing manifolds in India, as per data of FY 2017-18 top five states Madhya Pradesh, Panjab, Maharashtra, Rajasthan and Assam produce 91% of total production of India. This area increase might have been due to Kinnow's easy adaptability to varied agro-climatic conditions, heavy bearing and excellent juice quality characters which boosted its cultivation.

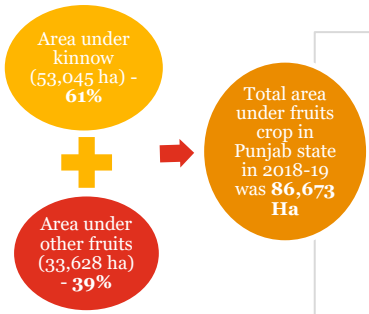


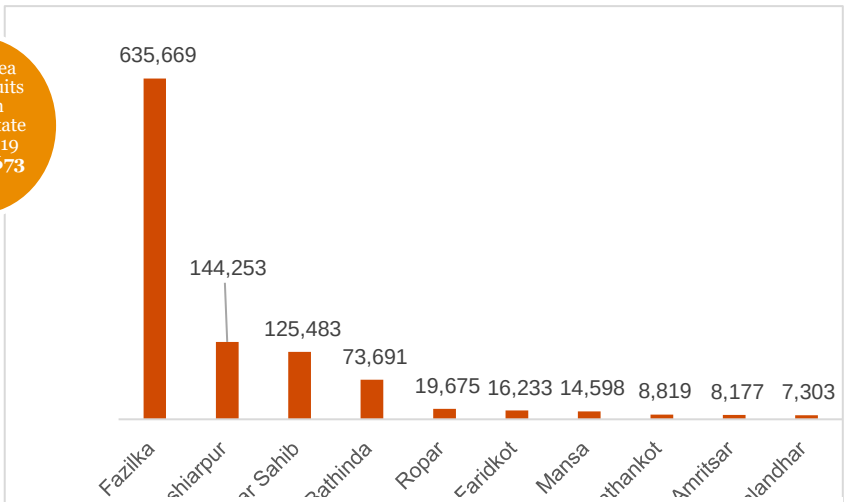
Graph 8: State wise production of Kinnow (2017-18)[1]

The factors which have contributed to the success of this fruit are its golden orange color, its abundant juice, and its excellent aroma and taste. The production of Mandarin in India has reached to over 19 states with 51,01,110 MT of production. Among these states, Madhya Pradesh tops in production with 41.24% production, Punjab stands second with the share of 23.69 % followed by Maharashtra (15.64%) and Rajasthan (6.23%)[34].

Clusters within the state:

In Punjab, citrus is the leading fruit crop among all the major fruits grown in Punjab. Today the most important commercial cultivars of citrus cultivated in Punjab state mainly includes mandarin (Kinnow) followed by sweet oranges, lime and lemon, tangerine and to a lesser extent





Graph 9: Major kinnow producing districts in states (in MT year 2018-19)

Source: Department of horticulture, Punjab Govt

[34] http://agriexchange.apeda.gov.in/india%20production/India_Productions.aspx?cat=fruit&hscode=1064

tangelo. Kinnow fruit, a hybrid of two citrus cultivars, namely, King (*citrus nobilis*) and Willow leaf (*Citrus deliciosa*) mandarins, cultivation in Punjab gained momentum among the fruit growers as it can be easily cultivated on the sandy loam soils and has higher profitability and good market value relative to some of the other crops in the state.

In 2018-19, total area under fruits in the state was 86,673 Ha, out of this area under Citrus (including sweet organs, lime/lemon and kinnow) was 57,288 Ha (approx. 66% of total area under fruit cultivation), the area under kinnow is 53,045 ha which is approx. 92% of the area under citrus and 61% area of total fruit crops. The total production of kinnow is approx. 97% of the total citrus production and 67% of the total fruit production of the state in 2018-19. The average yield of kinnow in the state is 23.5 tones / ha and average Income from Kinnow in the State is Rs 2,40,000 Per hac. Fazilka, Hoshiarpur, Sri Muktsar Sahib and Bathinda are major Kinnow growing districts of Punjab, around 92% of total production of state comes from these districts.

4.6.8.1. Clusters of Kinnow in Fazilka district

The district tops in the production of kinnow and sweet orange amongst all districts of the state, around 58.1% production of state comes from the district. Fazilka district has around 60% of the states production area of Kinnow [35]. Progressive Farmers of this district are producing Kinnow of high standards which is being exported to different countries. On an average, the farmers export 1,000 MT per day to Bangladesh and an equal quantity to domestic distant markets of Kerala, Tamil Nadu, Karnataka, Gujarat & West Bengal for three months from December to February.

There are two major production clusters in Fazilka district for Kinnow:

1. Abohar
2. Jalalabad

Abohar tehsil has around 90% of the total production of the district and it is major production center not only in the district but in the whole state. Abohar has around 55% of the production of the Punjab state and Kinnow Mandi in Abohar is the major trading center in the state.

Kinnow is harvested between December to March months in the district.

Particular	Start	Peak	End
Kinnow harvesting season	Dec	Jan-Feb	March

The post-harvest loss of Kinnow is very high around 25-30% of the total production. Post-harvest pre-processing plants like waxing and grading can reduce the loss by 10 to 15%.

4.6.8.2. Insights about the industry and sector

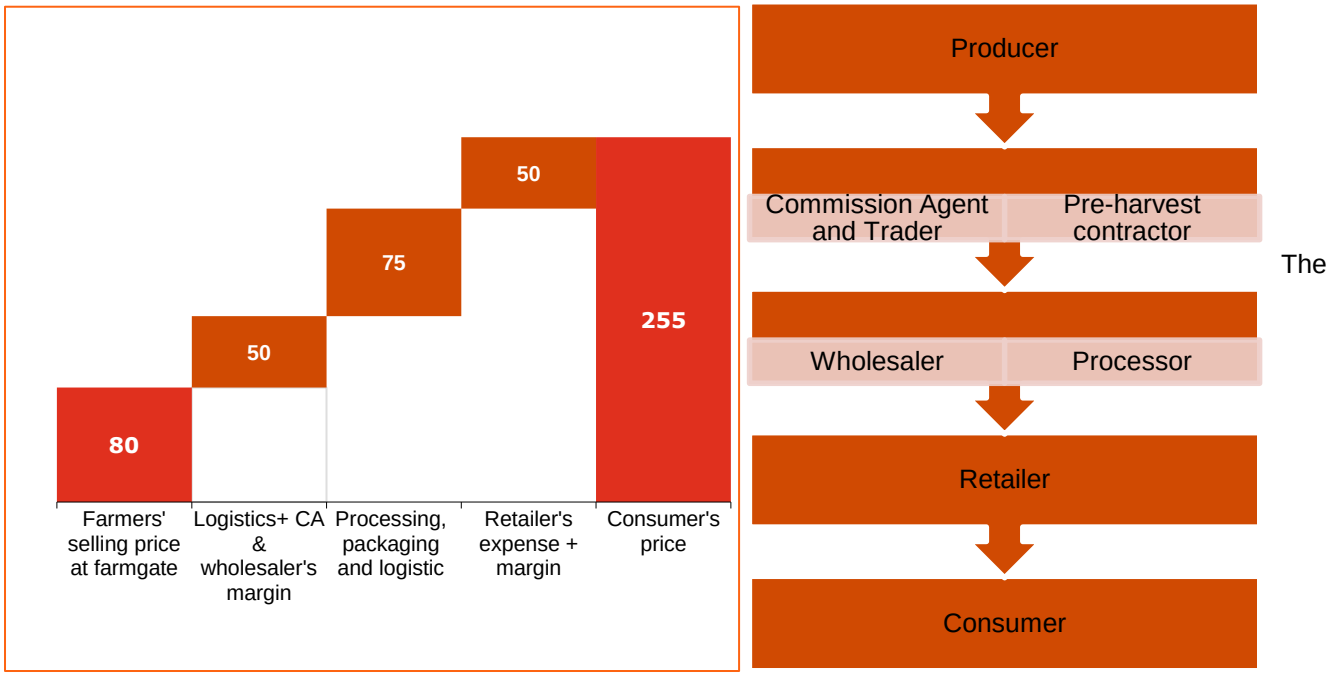
There are many waxing and grading plants in the district for Kinnow pre-processing. M/s. Punjab Agro Juices Ltd. in Alamgarh village of Abohar tehsil is large scale plant for Kinnow and other fruit juices.

There is government nursery maintained by the Horticulture department that caters to the demands of the farmers for supply of seedlings/saplings/ bud-wood for grafting. The value chain stakeholders play a significant role in increasing the value of the Kinnow through different activities like marketing, grading, waxing sorting, etc. different players of value chain are Producer, preharvest contactor, wholesaler, commission agent, retailer, processor, and consumers.

[35] https://midh.gov.in/VCS%20Reports/Value%20Chain%20Study%20on%20Kinnow%20in%20Punjab.pdf

1. Value chain of Kinnow

Kinnow farmers of district mostly sell their produce to pre harvest contractors or in local Mandis through various intermediaries.



Graph 10: Value chain and supply chain of Kinnow in the district. ***(value In Rs per 5 Kg)***

Physical functions

- The primary activities are cultivation, harvesting, grading, cleaning, waxing, and marketing
- Essential for increasing produce value regarding price and shelf life of produce

Financial functions

- Help in the smooth flow of product from producer to ultimate consumer
- Primary function performed by the stakeholders are price discovery between producer and pre-harvest contractor/ wholesaler, risk taking, providing advance credit to the producer/pre-harvest contractor, etc.

The farmer is the most dominant agent in the value chain, he plays a different role like cultivation, marketing and sorting and grading and many more function. The functions performed by the stakeholders are divided into physical and financial functions. Under physical functions, the primary activities are cultivation, harvesting, grading, cleaning, waxing, and marketing. These functions are essential for increasing Kinnow value regarding price and shelf life of Kinnow. Financial functions help in the smooth flow of Kinnow from farmers to ultimate consumer. The primary function performed by the stakeholders are price discovery between Farmer and pre-harvest contractor/wholesaler, risk-taking, providing advance credit to the producer /pre-harvest contractor, etc.

2. Challenges in the Kinnow value chain

Kinnow farmers of district mostly sell their produce in local Mandis. They are forced to sell locally because they don't have access to various market, they lack in getting price information from distant markets and, they don't have trustworthy parties to whom they can sell. Biggest risk for them is not getting payment back if they tried to sell produce to distance market or also no transparency in sales.

Farmers have less orientation towards processing aspect and thereby lack of processing machinery which insisted them to dispose of their entire commodity to market irrespective of future price advantage by processing the produce, majority of the farmers experienced the distribution failure, transportation failure and change in financial terms and condition in business contracts. Major challenges in the kinnow value chain in the district are:

Graph 11: Challenges in Kinnow value chain

a) Unavailability of processing Infrastructure

Facilities like soil test lab, packaging house, and primary processing center are available to the majority of Kinnow growers of the district.

Most of the farmers do not have kinnow pre-processing equipment on their farm and very few farmers have solar system and storage facility. The service like bio-control laboratory storage infrastructure, ripening chamber and mobile processing are not available in the district. There is a potential to set up multi chamber cold storage in the district.

There are many waxing and grading units in the district but most of these units are at tehsil or district level. There is lack of pre-processing units in the district at panchayat level for sorting and grading. Only 1-2 processing units are there in the district, which are involved in fruit juice manufacturing. In comparison to production value of the district, the number of processing plants are very less and because of which most of the production in the district is transported without processing. To enhance the price realization to the farmers, there is need of processing infrastructure development in the district.

b) Lack of skilled human resource

There is lack of skilled human resource in the district. Mostly farm laborer from Uttar Pradesh and Bihar are engaged in the farming related activities. Local labors are also available and involved in daily wage basis.

Human resource involved are mostly unskilled for value addition related process. For processing and value addition of kinnow there is need of skill improvement of the manpower and it is not available in the district. There is need of skill development of famers and human resource for pre-processing and processing related activities.

c) Unavailability of testing facilities for value added product

Soil testing labs are prevailing the district, many farmers are availing service of soil testing labs and they find it very useful but testing facility for value added products like juice etc. is not available and there is need to develop these facilities.

d) Lack of Institutional support

To source the saplings, majority of farmers get benefits from the MIDH (Mission for Integrated Development of Horticulture), NFSM, RKVY etc. Source of information is the primary accelerator in the production, and majority of farmers rely on personal information.

As Kinnow produce is highly perishable and sensitive to high temperature. The cold storage facilities in the rural area are lacking in the district. Most of the farmers are unsatisfied by cost/quality, un-skill labour, and soil fertility and irrigation water and marketing support. Farmers' producers' organization role in the aggregation of produce, organizing production and marketing of kinnow and alternative marketing channels is absent in the district. There is need of development of storage and preprocessing infrastructure in rural area, which can be managed through community-based institutions.

e) Issues in credit linkage

Credit is an essential input in agriculture that has multiple effects on production and farm income. Lack of information on credit product and small scale of operation found to be major limiting factor in accessing the credit. Many farmers and entrepreneurs are not able to get credit facility to establish processing unit because of non-availability of asset for mortgage.

4.6.8.3. Suggested intervention and vision

There is need of intervention at post-harvest stage on storage, grading, waxing and value addition. Community level post-harvest infrastructure need to be developed and community-based institutions such as Farmer Producer Companies and cooperatives should be promoted, which can involve in primary processing and storage related activity.

Setting enterprises for processing of kinnow can help in better price realization to farmers, which in turn help farmers to get motivated and there will be expansion in production area. Kinnow processing will help in fetching export market and it will help in reduction income inequality among farmers.

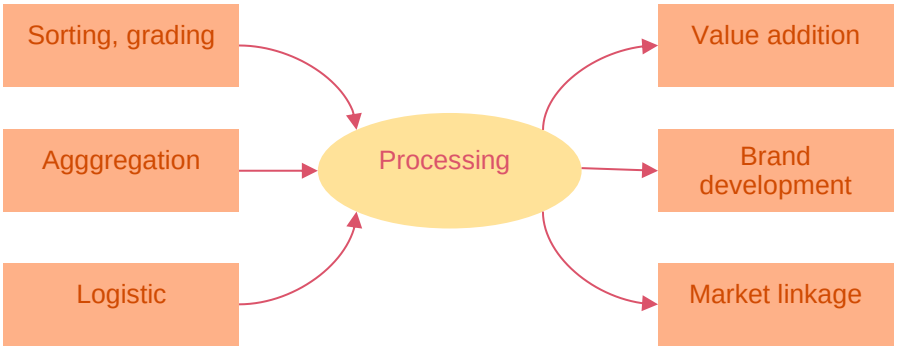
SWOT Analysis	
Strengths: • Kinnow is widely consumed around India and abroad • Punjab is leading producing state. • Kinnow/ have a potential of providing an earning up to Rs 1.5 lakh/ annum per ha. • There is good scope of value addition as pulp, juices etc. • Kinnow mandarin bears highest place in juice content and fruit quality among all citrus fruit.	**Weakness:** • Fall in procurement prices during the glut season. • Perishable nature of the fruit. • Lack of access to remunerative market for the sale of produce.
Opportunities: • High export potential for the fruit. • High potential for processing. • Collaboration with organized retail players for the direct sale of the produce. • Scope of tie ups with large companies like Pepsi, Coke etc.	**Threats:** • Rising production cost for the producer. • High amount of wastage leading to lower return for the producer.

There is need of development of processing infrastructure in the district, it will also help in generation of employment opportunity in the region. The community-based institution can be established at ground, which can work for establishing processing units, market and developing skill, capacity building of farmers for processing of Kinnow. Kinnow processing can help district in developing it as important ODOP of the district, SWOT analysis for this is shown in the table.

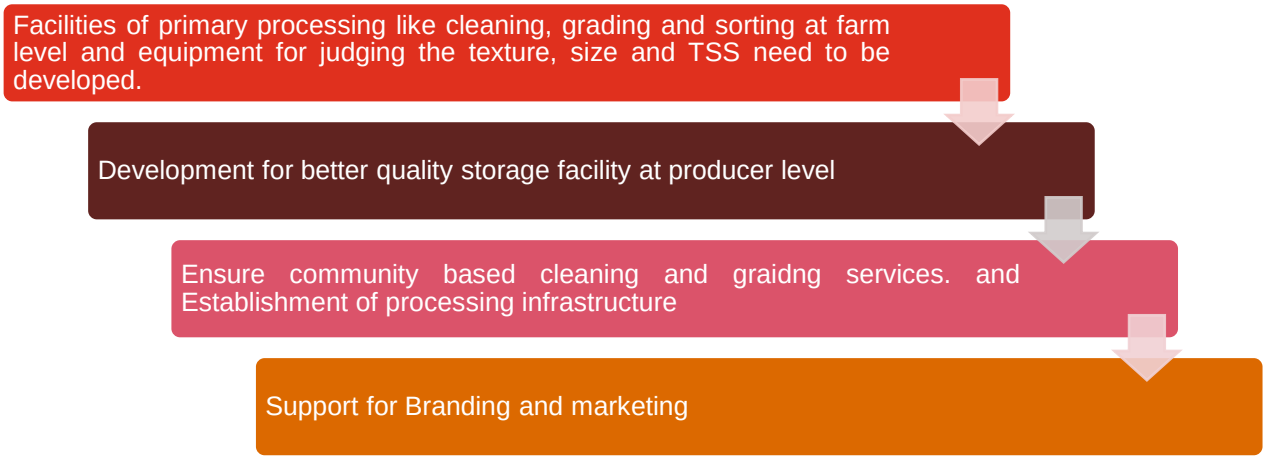
Suggested model

There are many products which can be formed by processing of Kinnow like Juice, jam and jelly etc.

Before processing for better quality of fruit sorting, grading, waxing, and packaging related facilities need to be developed in the district.



Intervention required for Kinnow processing need to focus on all the aspects of post-harvest management which include sorting, grading, logistic, processing to value added products and finally branding and market linkage of the processed products. Based on the existing challenges and prevailing conditions in the district, following interventions are required: -



Suggested interventions for overcoming the challenges of existing of value chain are shown below:

#	Particular	Interventions
1	Skill training needs	Agriculture Universities, local level government institutions, KVKs can focus on skill and capacity building of the human resource and farmers.
2	Manufacturing practices	Value addition has the potential for kinnow. Kinnow heads its way to market from a farm in winter. As summer approaches demand value-added fruit products increases. Kinnow value-added fruits would undoubtedly create market share against other fruit because of freshness, taste that has not much deteriorated due to short duration storage. With the increasing demand, the new product will emerge and gives consumer choice and chance to farmers for getting more income if they store/ tune their production.
3	Technologies	There is an urgent need for the establishment of primary processing centers, mobile centers and ripening chambers which acts as a primary guard against spoiling of fruit and There is need for Improvement of available storage infrastructures and expanding the area.
4	Access to finance	Care need be taken by lending agencies to reduce the transaction cost by giving appropriate credit, removal of intermediaries and introduction of paperless loans that reduce both cost and energy.

5	Access to mentorship / service	There should be mentorship facilities for entrepreneurs and farmers for adopting better technology for processing and storage etc,

Table 3: Suggested interventions for kinnow processing

4.6.8.4. Pre-processing and post-harvest management

Infrastructure for pre-processing and post-harvest management need to be development. The better-quality product get higher price and it help high standard end value added product.

a) Grade specification and grading at farmer level

Post-harvest grading at producer level is not common in the district and efficient grading facilities at farm level need to be developed, it will help in decreasing the post-harvest loss. Weight, size, color, shape and degree of damage on fruit are the common parameter on which grading is done. Currently farmer grade only based on immature, rotten or diseased fruits and high-tech facilities are not available. There is need of automatic grading and sorting facility to enhance the productivity.

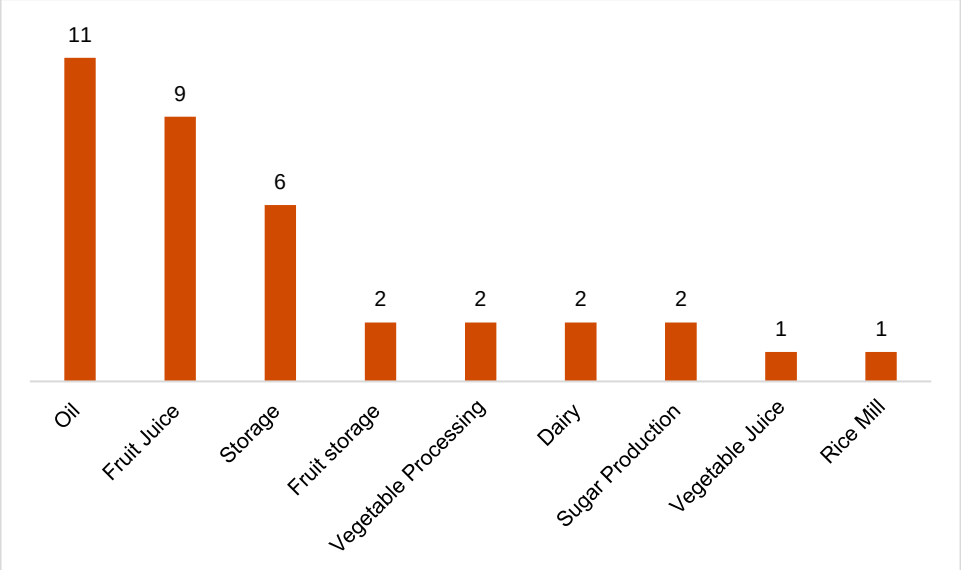
b) **Skill development for post-harvest disease control, storage, and transportation**

Fruits get infected with fungus and other diseases after harvesting if proper handling of post-harvest is not done properly. The treatment of fruit with required chemical need skills and which is lacking in most of the labors working in the field. While storage and transportation, the care need to be taken so that plastic crates or boxes should have only one or two layers, and boxes should be stored in ventilated conditions. For all these functions, producer and human resources should be well trained.

4.6.9. Non ODOP products in the district

4.6.9.1. Processing industry of Non-ODOP products in district

Study is conducted for 36 food processing units in the Fazilka district. Out of these units 30% are involved in oil production, 25% of the units are involved in fruit juice production and total capacity of these 9 plants approx. 600 MT / day. Other units involved storage units for grain and other commodity, fruit storage, vegetable processing, dairy, sugar production, vegetable juice and paddy processing (rice mill) etc.



Graph 15: Food processing units of Non- ODOP products in Fazilka
Source: FSSAI, analysis PwC

The oil extraction units are involved in extraction of oil from rice bran, mustard, cotton seed and soyabean etc.

Fish can be next potential ODOP in the district, government is giving impetus on promotion of fisheries in the district new government fish seed farm has been initiated in village Killian Wali district Fazilka. High productivity fish production technology of Re-Circulatory Aquaculture System introduced during the year 2019-20 and to be expanded to 8 units during the FY 2021- 22 Currently, fish is sold as fresh in local markets or processors in other states like Andhra Pradesh due to the lack of processing facilities. This gives immense potential for fisheries processing in the district.

4.7. Fatehgarh Sahib

4.7.1. Socio economic profile

The historic and pious District of Fatehgarh Sahib came into existence with effect from 13th April, 1992, Baisakhi Day, deriving its name from Sahibzada Fateh Singh, the youngest son of Guru Gobind Singh Ji. It is bound by Ludhiana and Rupnagar (Ropar) in the North, Patiala in the South, SAS Nagar (Mohali), Rupnagar (Ropar) and Patiala in the East and Ludhiana and Sangrur in the West. As per the geographical area of the district, it is the second smallest district after Pathankot.

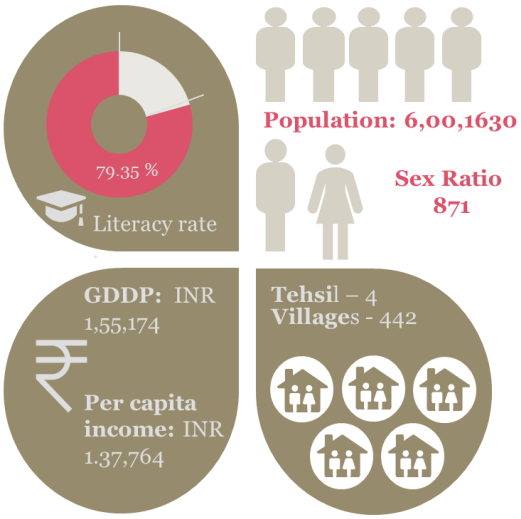
The economy of the district depends mainly on agriculture, industry and allied activities. Fatehgarh Sahib city is the district headquarter and the district are comprising 4 tehsils namely Fatehgarh Sahib, Bassi Pathana, Amloh and Khamanon. The district has five blocks namely Bassi Pathana, Amloh, Khamanon, Khera and Sirhind.

The Gross District Domestic Product (GDDP) of this district and per capita income of the people in Fatehgarh Sahib is much higher than the state average.

4.7.2. Demographic profile

According to 2011 census Fatehgarh Sahib district has a population of 6,00,163 persons of which male and female population is 53.45% and 46.55% respectively. It constitutes 2.20% of total population of the state. In the district, 69.10% of the population resides in rural and 30.90% in urban areas. The district comprises of 442 villages.

The district has a sex ratio of 871 females for every 1000 males. The literacy rate of the district is 79.35%.



Graph 50: Socio economic profile of fatehgarh sahib district

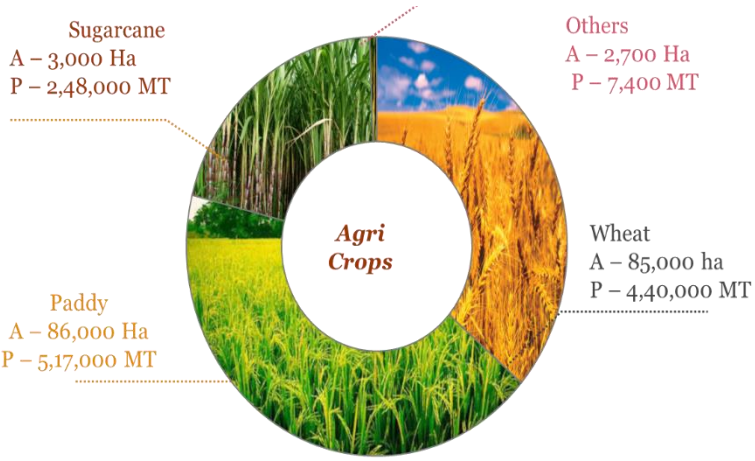
Source: Census 2011

4.7.3. Climate and Rainfall

The climate of the district is classified as tropical steppe, hot and semi-arid which is mainly dry with very hot summer and cold winter except during monsoon season The normal annual rainfall of the district is 692 mm. Monsoon rainfall contributes 79 % of annual rainfall in the district. The rainfall increases from southwest to northeast in the district.

4.7.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is over 89%. The district has the cropping intensity of over 187%. The economy of the district depends mainly on agriculture, industry and allied activities. The topography of the district is even. It is mostly a plain of alluvial type. It also has loam to heavy loam and sand to sandy loam soils in certain parts of the district. Soil is rich in nutrients and suitable for crops like wheat, Paddy, Oil seeds, Sugar Cane, Potato and vegetables etc.



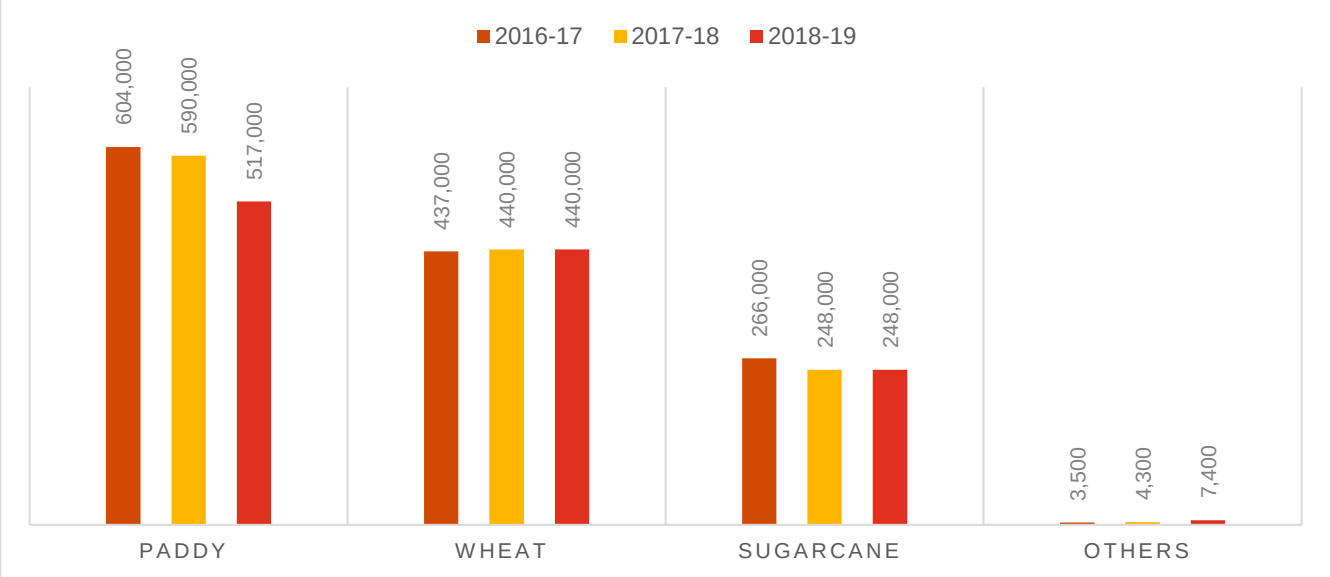
The main crops grown during kharif is paddy and wheat in Rabi. The other crops grown in the area are sunflower, Sugarcane, Bajra, Barley etc.

Graph 51: Major Field crops grown in district Fatehgarh Sahib, (2018-19)

Source: Department of Agriculture, Govt. of Punjab

Production trend- Field crops

Area under Paddy and Wheat has been consistent during the past three years, however production of Paddy has shown a declining trend for Paddy with Wheat having the same production over the years.

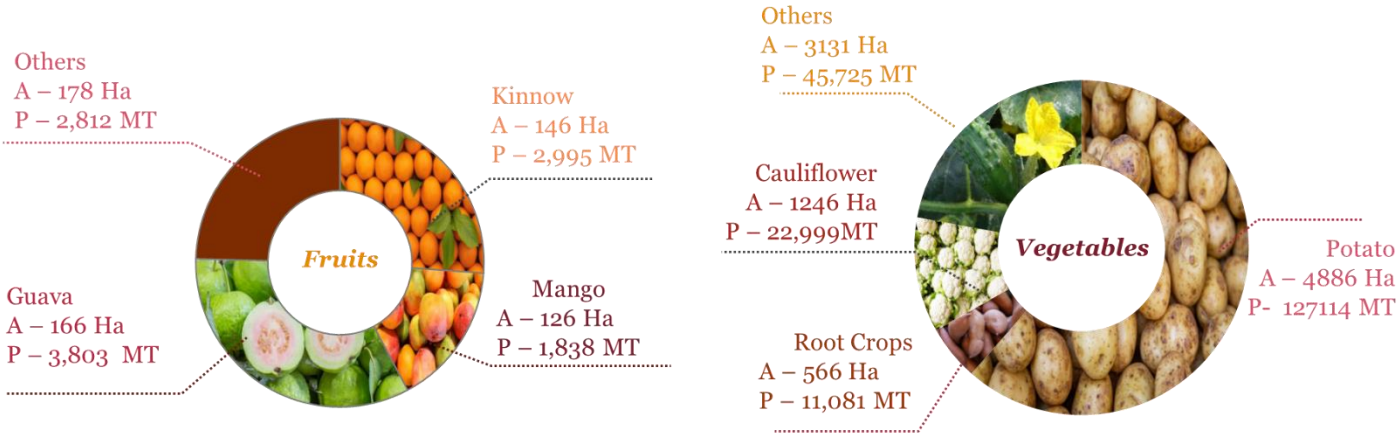


Graph 52:Production trends of field crops in Fatehgarh Sahib district (MT)

Source: Department of Agriculture, Govt. of Punjab

4.7.5. Horticulture profile

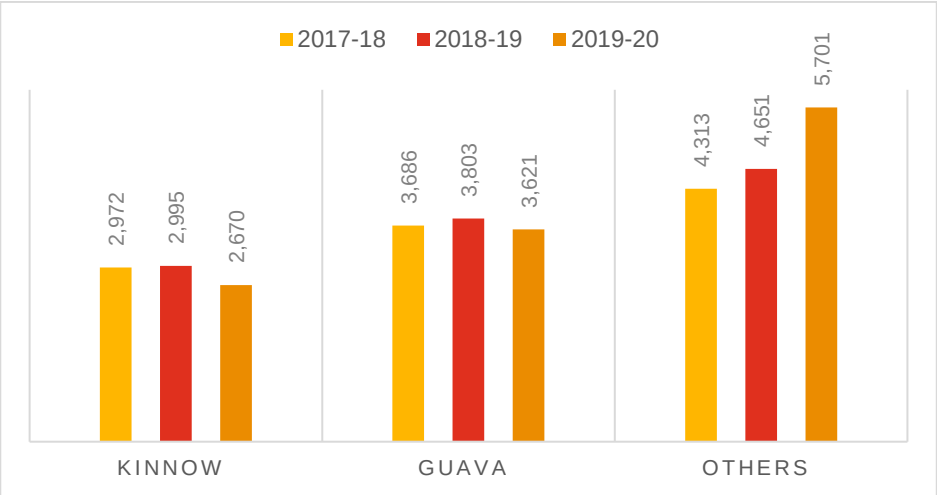
The district also produces a wide range of vegetables like potato, peas, cauliflower, root crops etc. Out of all vegetables, maximum area is under Potato.



Graph 53: Major fruits and vegetables grown in the district Fatehgarh Sahib (2018-19)

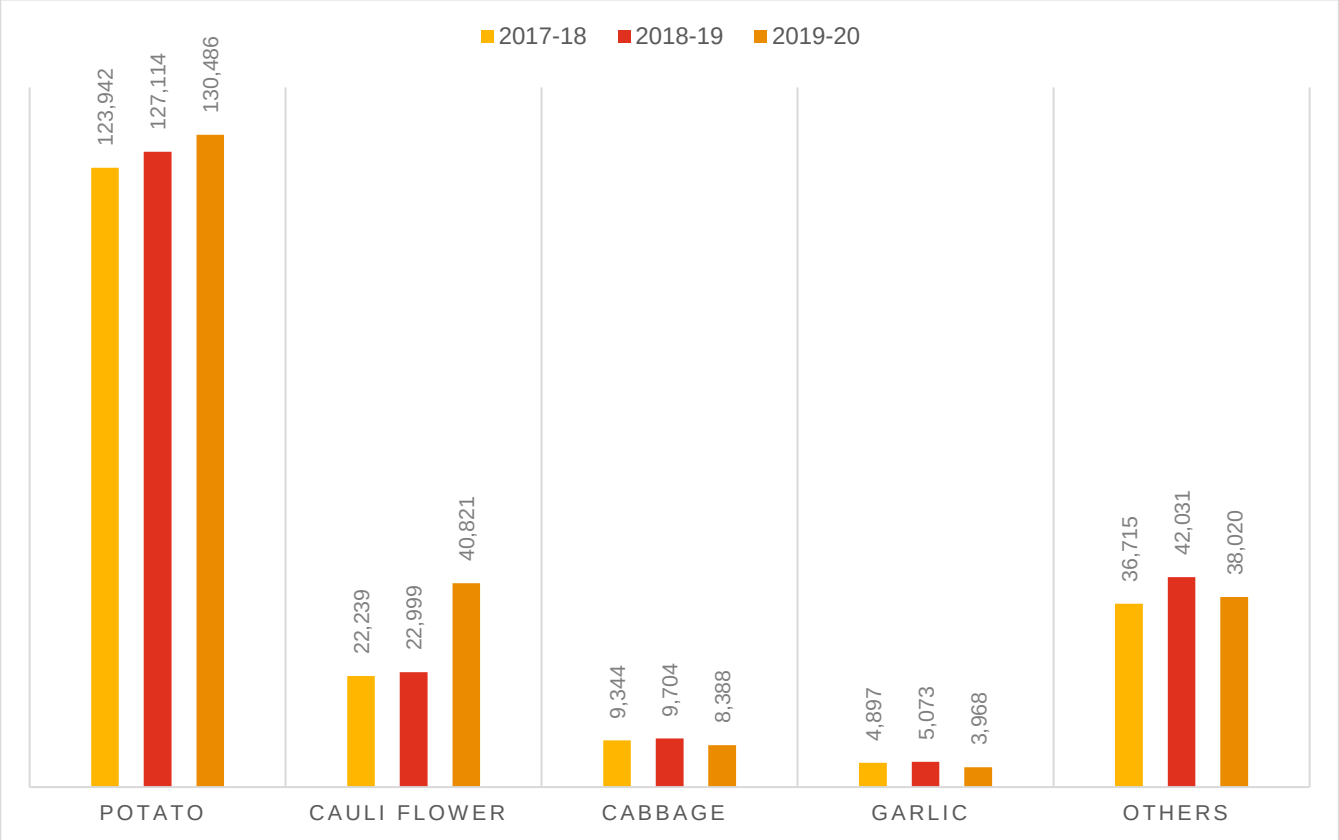
Production trends-Horticultural crops

Production of Guava and Kinnow has shown consistency over the last three years. However, area under Mango has shown significant increase over the years.



Graph 54: Production trend of major fruit crops in Fatehgarh Sahib district (MT)

Production of Potato and cauliflower has shown a significant increase over the years however production of other crops has seen a declining trend.



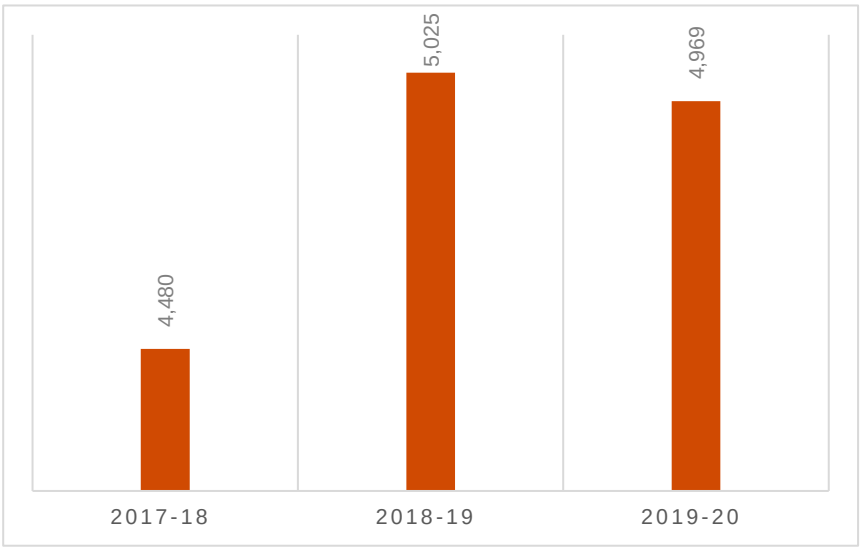
Graph 55: Production trend of vegetable crops in Fatehgarh Sahib district (MT)

4.7.6. Allied activities profile

Production trends-Fish

The production of fish in the district varied between 4,500 MT to 5,000 MT in past three years.

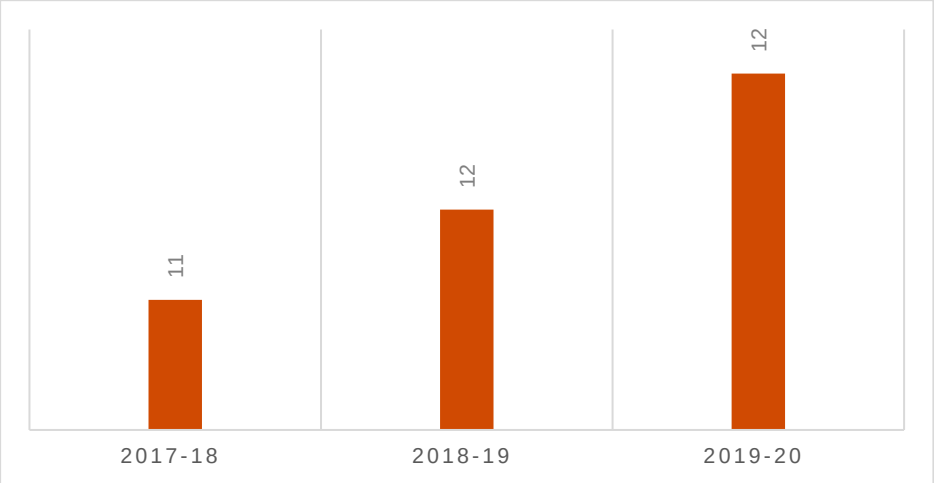
The district has around 1,300 acres under fish cultivation. The varieties being cultivated include katla, rohu, marak and exotic varieties like silver carc, grass carc, common carc etc.



Graph 56: Production trends of Fish in Fatehgarh Sahib (MT)

Production trends-Milk

The district produces about 12.5 lac litre/day of milk. There are two medium sized milk plants (Chanakya Dairy Products, Mandi Gobindgarh and PRS Milk Products, Chunni – Morinda Road) manufacturing pasteurized milk, paneer, curd, butter, sweet meat, skimmed milk powder etc.).



Graph 57: Production Trends of Milk in Fatehgarh Sahib (LLPD)

4.7.7. Industrial profile

There are 3441 registered Micro Small enterprises in the district and 21 registered medium and large enterprises providing employment to 25779 and 4086 persons respectively, as per FY 2014-15. There are one industrial areas in the district.

Table 10: Industry in Fatehgarh Sahib (2014-15)

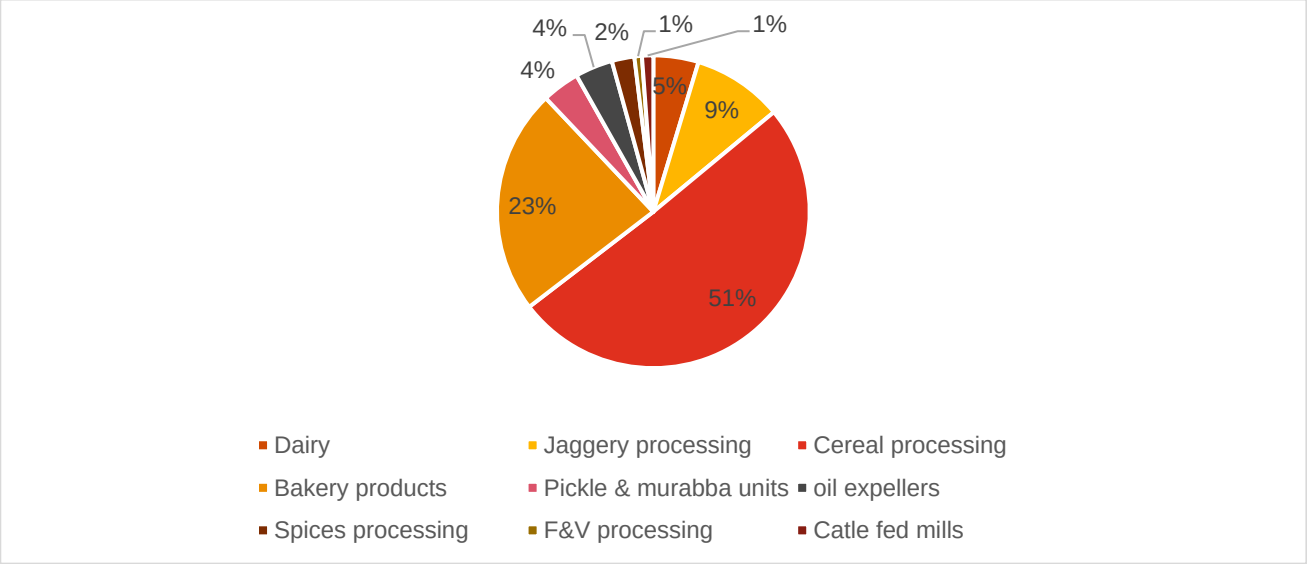
Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	3441
2	Registered Medium & Large Units	No.	21
3	Employment in MSE Sector	No.	25779
4	Employment in Large and Medium Industries	No.	4086
5	No. of Industrial Areas	No.	1
6	Turnover of MSE Sector	Rs. Lakh	489713
7	Turnover of Large & Medium Sector	Rs. Lakh	413843

Micro food enterprises in the district is dominated by cereal processing units. About 65% units in the district is into cereal processing. There are over 15 mini rice mills, 600 atta chakkis, 2 medium size roller flour mills, 150 mills shelling common paddy, 3 medium sized solvent extraction plants, oil expeller and about 300+ bakery units in the district.

In the district there are four medium sized vegetable processing units, two medium sized milk plants manufacturing pasteurized milk, paneer, curd, butter, sweet meat, skimmed milk powder etc., 50+ micro and small dairy processing units, about 15 cattle feeds mills in the district.

As per the primary survey about 9% of the micro food enterprises are into jaggery manufacturing. Farmers manufacture jaggery at farm level and manufacturing is done conventional way in open pans.

There are number of Self Help Groups and FPOs engaged in the processing and packing of pickles, chutneys, murraba, haldi etc.



Graph 58: spread of micro food enterprises in the district

4.7.8. ODOP

Sugarcane & allied products has been selected as ODOP of the district. Sugarcane is widely used in the district to manufacture Jaggery and Jaggery products. Jaggery is traditional Indian Sweetener without any chemical. Jaggery is predominantly sucrose with traces of mineral salts. It has many health benefits as compared to sugar.

There are over 60 manufacturing units of Jaggery in district Fatehgarh Sahib. Products manufactured are jaggery cubes, jaggery powder, jaggery toffees, jaggery mixed with sauf, dry fruits etc. Most of the micro enterprises involved in jaggery production follows conventional system of production through open pan boiling furnace, molding of jaggery in wooden panel etc. Juice extraction, filtration and boiling of juice for concentration and then cooling and solidifying to give jaggery blocks. During boiling chemical bleaching agents or natural vegetable items like Bhindi (Lady finger) are added to clean the juice and the extraneous matter is constantly removed to give a bright golden colour. Baring a couple of units, all these units needs technological up-gradation to enhance quality and shelf life of their products.

4.8. Moga

4.8.1. Socio economic profile

The district Moga falls in Western plain zone. It is located somewhat in the centre of Punjab. In the North and North East, it is bounded by district Jalandhar, in the West by district Ludhiana, in the South East by district Barnala, in the South by district Bathinda, in the South West by district Faridkot and in the West by district Ferozepur. Moga District is the 17th District drawn on the map of Punjab State on 24th day of November 1995. Before this, Moga was the sub-division of Faridkot District.

The history of Moga district pertaining to the ancient period has been traced to the Indus valley civilization. A few sites explored in Moga district link it with the Indus valley civilization sites

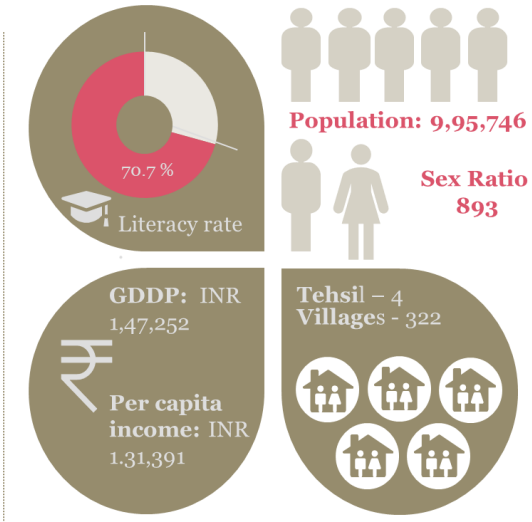
Moga town is the head quarter of the District. The district is comprising of four tehsil namely Moga, Baghapurana, Nihal singh wala, Dharmkot. The district has 5 blocks name as Moga I, Moga II, Baghapurana, Nihal singh wala and Kot-Ise-Khan.

The district Gross District Domestic Product (GDDP) and per capita income at current price, is above then the state average.

4.8.2. Demographic profile

According to 2011 census Moga district has a population of 9,95,746 persons of which male and female population is 53% and 47% respectively. The district has 3.6% of total population of the state. Out of the total population, 76% of the population resides in rural and 24% in urban areas. The district comprises of 322 villages.

The district has a sex ratio of 893 females for every 1000 males. The literacy rate of the district is 70.7%.



Graph 59: Socio economic profile of Moga district

4.8.3. Climate and Rainfall

The climate of the district can be classified as tropical and dry sub humid. June is generally the hottest month. Scorching hot winds laden with dust blow during summer. In summer the temperature may reach upto 45^0C. In winter the minimum temperature may dip to 1^0C. January is usually the coldest month. The normal annual rainfall is about 498 mm.

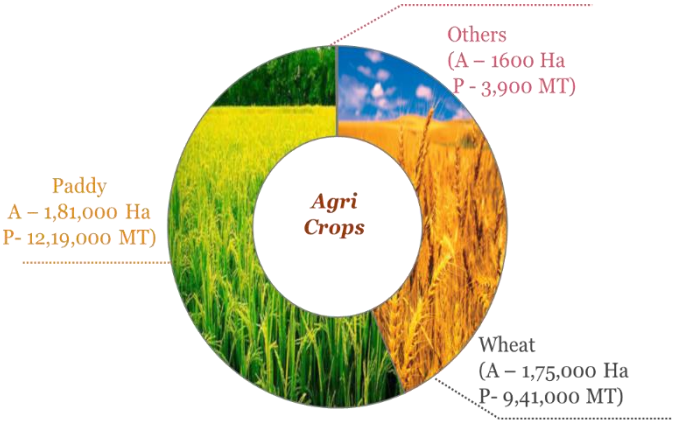
4.8.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is over 87%. The district has the cropping intensity of 200%. The topography of the district is even.

The main crops grown during kharif is paddy and wheat in Rabi. The other crops grown in the area are sunflower, Sugarcane, Bajra, Barley etc.

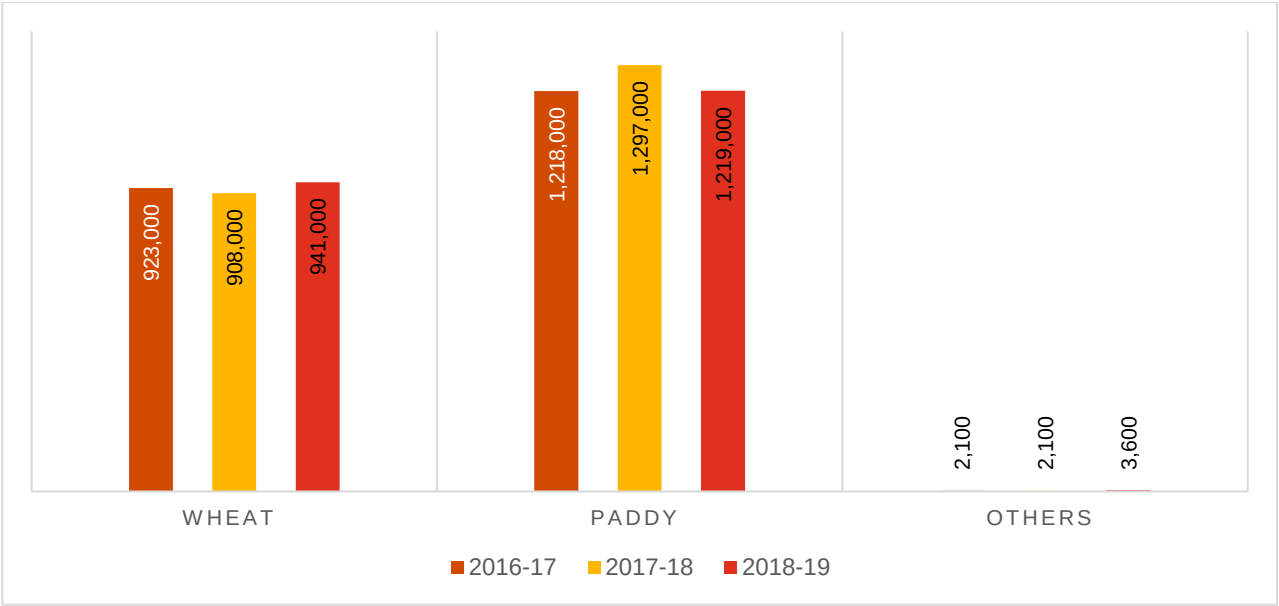
Production trends-Field crops

The area under field crops in the district has been consistent over the years.



Graph 60: Major Field crops grown in district Moga (2018-19)

Source: Department of Agriculture, Govt. of Punjab

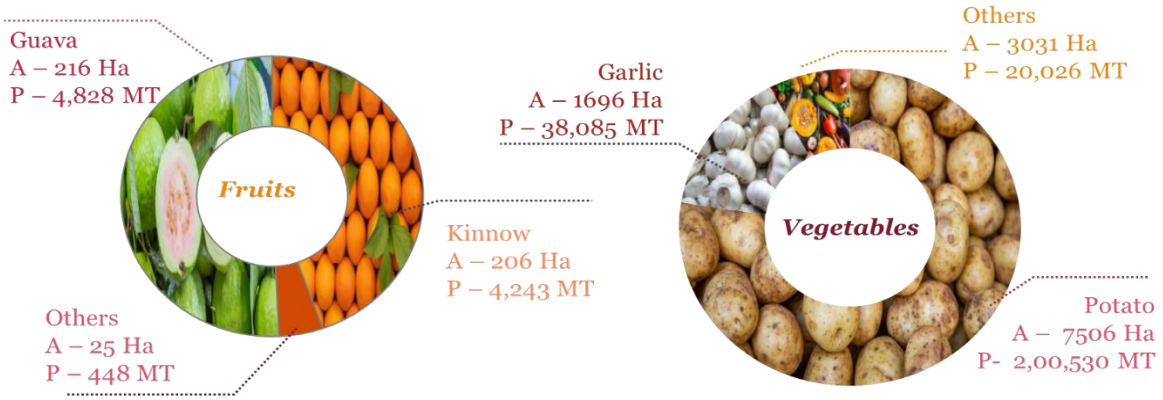


Graph 61: Production trend of field crops in Moga district (MT)

Source: Department of Agriculture, Govt. of Punjab

4.8.5. Horticulture profile

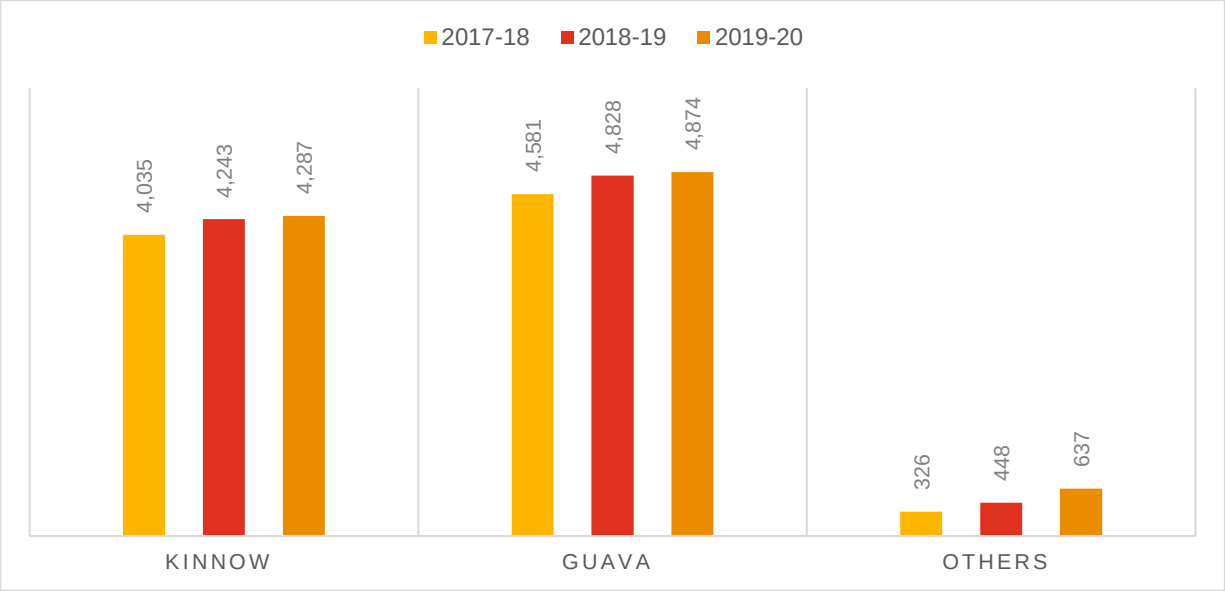
The district also produces a wide range of vegetables like garlic, cauliflower, vine crops, root crops, tomato, chillies, etc. Out of all vegetables, maximum area is under Potato. The area under potato shows a cumulative growth of 11% in last three years. It is mentioned that the district produces large quantities of potatoes used by French Fries manufacturing companies like Mc Cane, Iscon Balaji, Hyphen etc. The district produces kinnow and guava, but in limited quantities. However, there has been good cumulative growth of 18 to 19% in area under these crops during past three years



Graph 62: Major fruits and vegetables grown in the district Moga (2018-19)

Production trends- Fruits

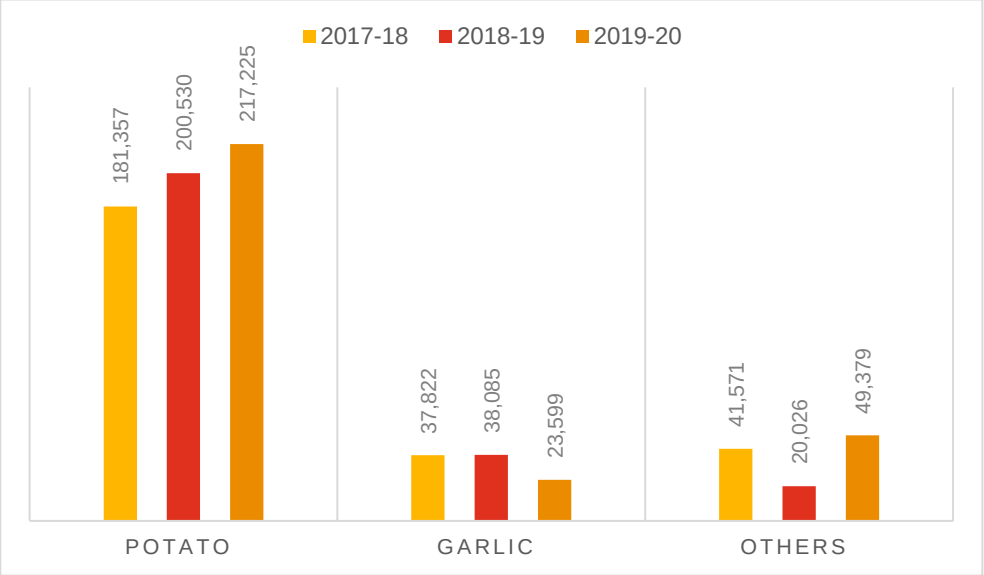
Production under Guava and Kinnow has shown an increasing trend over the years in the district.



Graph 63: Production trends of fruit crops in Moga district (MT)

Production trend of vegetable crops

Production Potato has shown an increasing trend whereas Garlic has shown an decreasing trend over last three years.

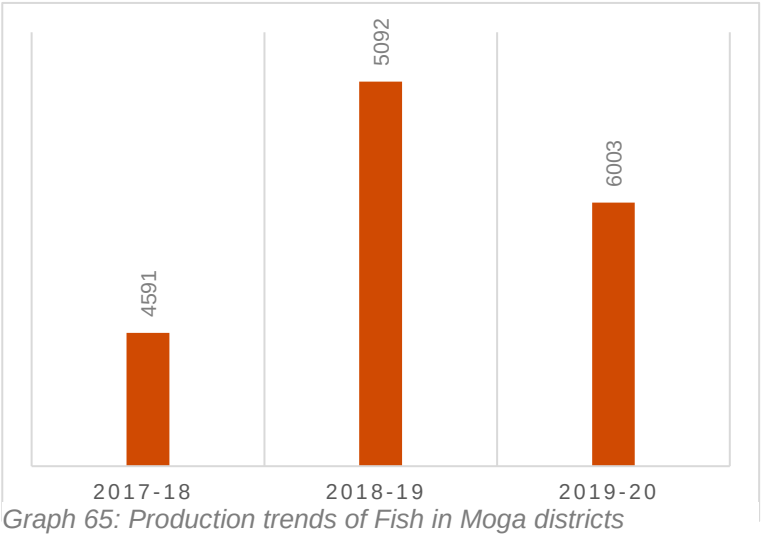


Graph 64: Production trend of vegetables in Moga district (MT)

4.8.6. Allied activities

Production Trends- Fish

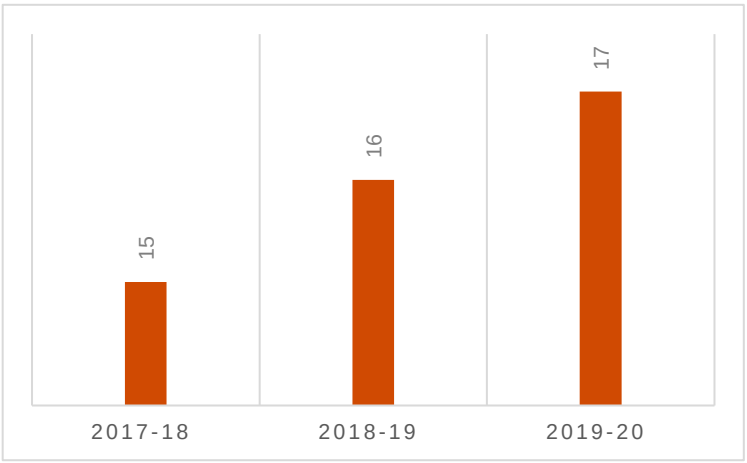
The production of fish in the district is fluctuating between 4,000 to 6,000 MT in last three years.



Graph 65: Production trends of Fish in Moga districts

Production Trends- Milk

The district produces over 16 lakhlitre/day of milk. There has been a consistent increase in the production of milk in the past three years (2017-20) and a cumulative growth of 14% has been recorded during this period.



Graph 66: Production trends of Milk in Moga district (LLPD)

4.8.7. Industrial profile

There are 2600 registered Micro Small enterprises in the district and 5 registered medium and large enterprises providing employment to 22436 and 1812 persons respectively, as per FY 2014-15. There are one industrial areas in the district.

Table 11: Industry in Moga (2014-15)

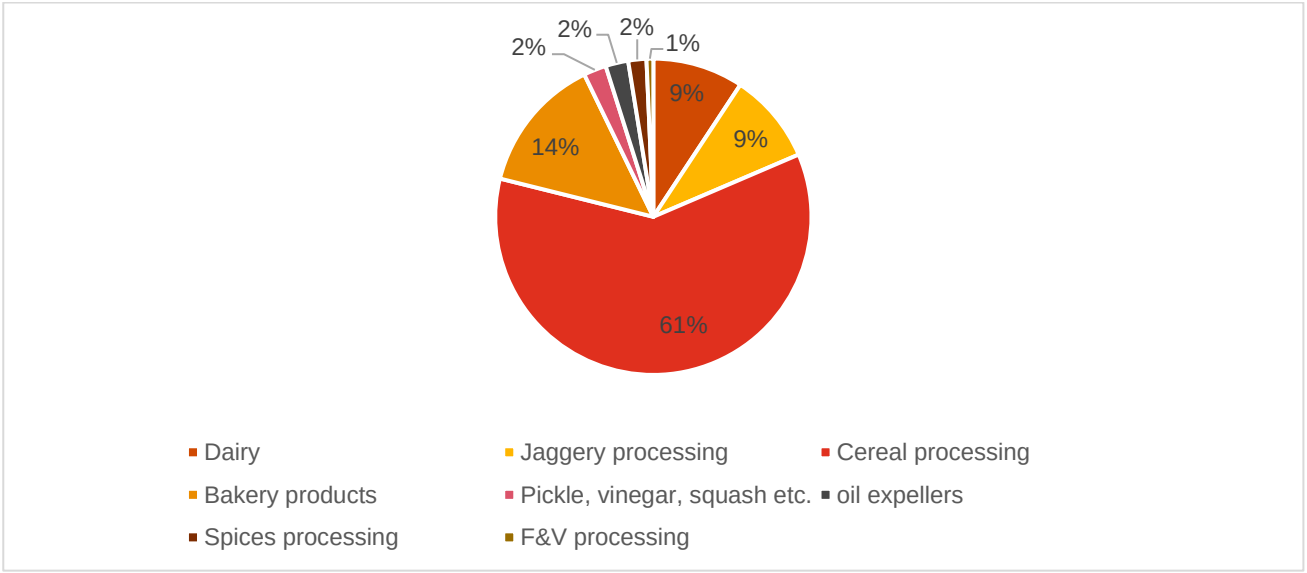
Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	2600
2	Registered Medium & Large Units	No.	5
3	Employment in MSE Sector	No.	22436
4	Employment in Large and Medium Industries	No.	1812
5	No. of Industrial Areas	No.	1
6	Turnover of MSE Sector	Rs. Lakh	91600.58
7	Turnover of Large & Medium Sector	Rs. Lakh	26031.1

Like other districts cereal processing is the dominant subsector with 61% share in total micro food enterprises in the district. There are over 300 small sized rice mills, 1,000 atta chakkis, 15 modern wheat flour mills in the district. Krishi Vigyan Kendra (KVK), Moga has set up demo pulse cleaning and grading facility at their centre and about more than 300 bakery units in the district.

Nestle and Paras Spices are the main ready-to-cook and ready-to-eat food processing units. Paras spices processes about 15,000 MT of spices per annum. They sell their produce under the brand name of 'Orika'. They are also into animal feed, chicory processing, manufacturing of herbs and specialty food ingredients.

About 14% of the micro food enterprises are into manufacturing of bakery products, gajak etc. Most of the units are conventional bakery units which require upgradation. Hence, after ODOP bakery is the next potential product which can be given preference to promote formalization of micro food enterprises in the district.

There are a large number of individual unregistered micro and small food processing units engaged in the manufacture of pickles, vinegar, sharbet, squash, spices, murraba etc. In the district there are has around 200 dairies processing a variety of products like butter, curd, lassi and cream to meet the daily demand of urban population



Graph 67: Spread of different micro food enterprises in the district

Source: Primary survey

4.8.8. ODOP

Pulses is the ODOP for the district

Pulses crops like Moong and Arhar are grown in the district.

4.9. Pathankot

4.9.1. Socio economic profile

Pathankot was officially declared as district on 27 July 2011 by Government of Punjab. In past, it was a Tehsil of the District Gurdaspur. It is a meeting point of the three northern states Punjab, Himachal Pradesh and Jammu and Kashmir. Due to its ideal location, Pathankot serves as a travel hub for the three northerly states. It is the last city in Punjab on the national highway that connects Jammu and Kashmir with the rest of India. Situated in the picturesque foothills of Kangra and Dalhousie. The geographical area of the district is 94,000 Hectare, **the smallest amongst all the districts of the state.**

Pathankot city is the head quarter of the District. The district is comprising of two tehsils namely Pathankot and Dharkalan. The district has 6 blocks namely, **Narot Jaimal Singh, Bamial, Dharkalan, Pathankot, Gharota and Sujanpur**. The district has 462 inhabited villages.

The district Gross District Domestic Product (GDDP) and per capita income at current price, is below then the state average.

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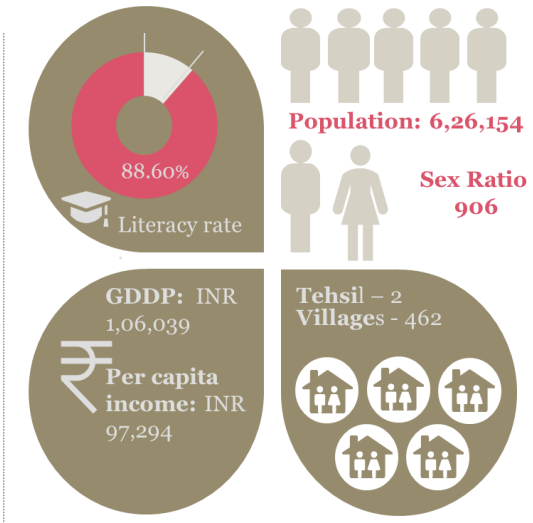
4.9.2. Demographic profile

According to 2011 census Pathankot district has a population of 6,26,154 persons.

The district has a sex ratio of 906 females for every 1000 males. Which is higher than the state average. The literacy rate of the district is 88.60%.



4.9.3. Climate and Rainfall

The temperature in summer (from Mid-May to Mid-June) may rise to a maximum of 48 °C (rarely). Temperatures in winter, remain at (max) 7 °C to 15 °C and (min) 0°C to 8 °C. The district receives moderate to heavy rainfall. The annual rainfall is 688 mm.

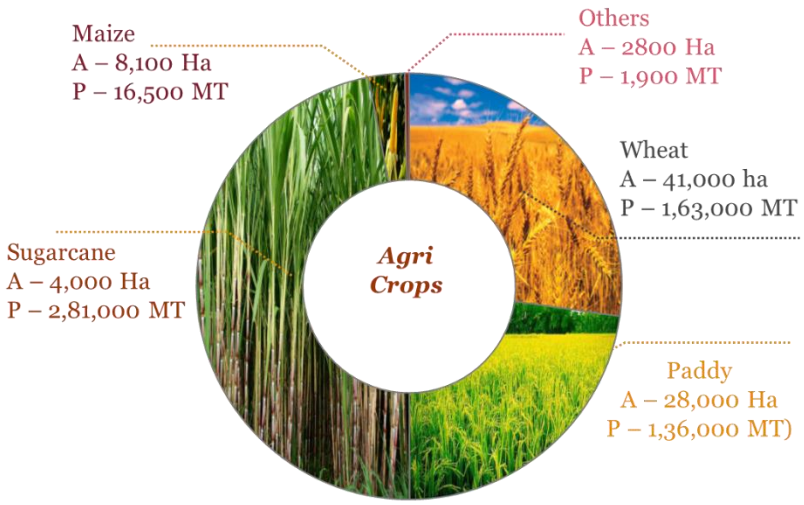
4.9.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is over 50%. The district has the cropping intensity of 193%. The landscape of the district has varied topography comprising the hilly tract, undulating plains, the flood plains of the Ravi and Beas rivers and the up landplains.

Agriculture is prominent in the district. Paddy, wheat, maize and sugarcane are the main crops.

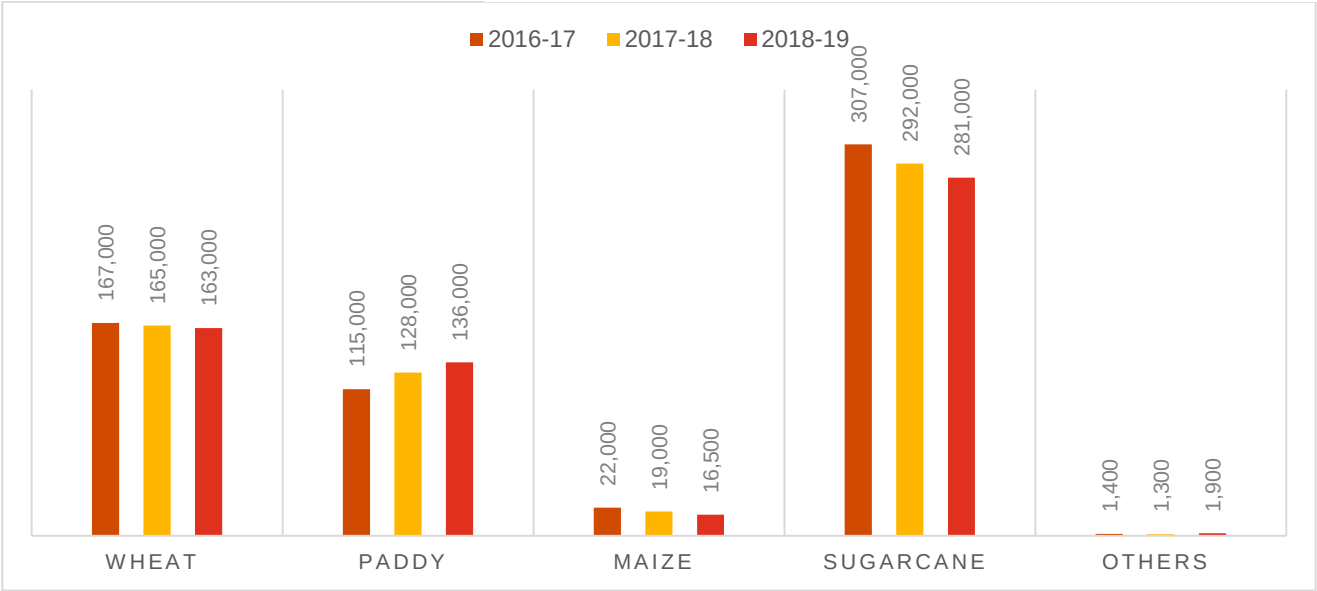
Production trend-Field crops

Production of Paddy has increased consistently over last three years. However, production of Maize and Sugarcane has shown declining trend.



Graph 68: Major Field crops grown in district Pathankot (2018-19)

Source: Department of Agriculture, Govt. of Punjab

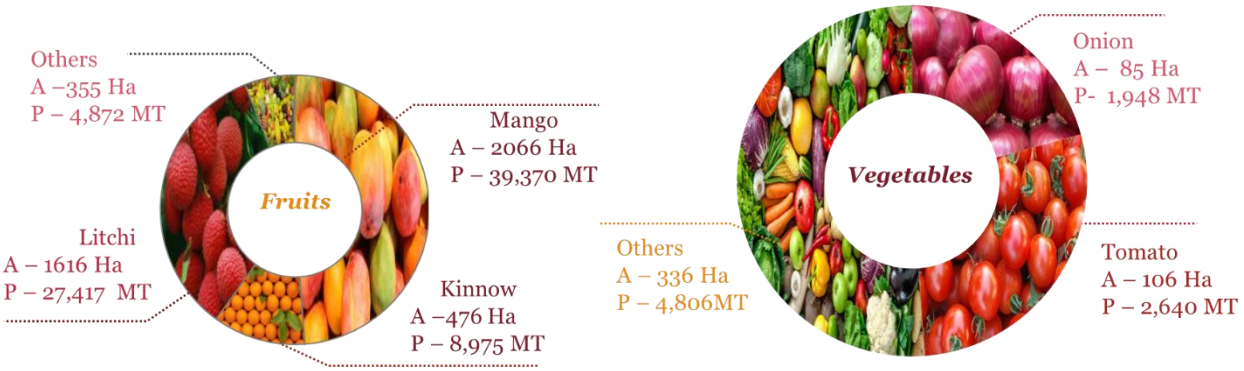


Graph 69: Production trend of field crops in Pathankot district (MT)

4.9.5. Horticulture profile

The district produces a wide range of vegetables like tomato, onion, cauliflower, peas, okra, vine crops, root crops, etc. Out of all vegetables, maximum area is under tomato and this has recorded a spectacular cumulative growth of 125% in last three years

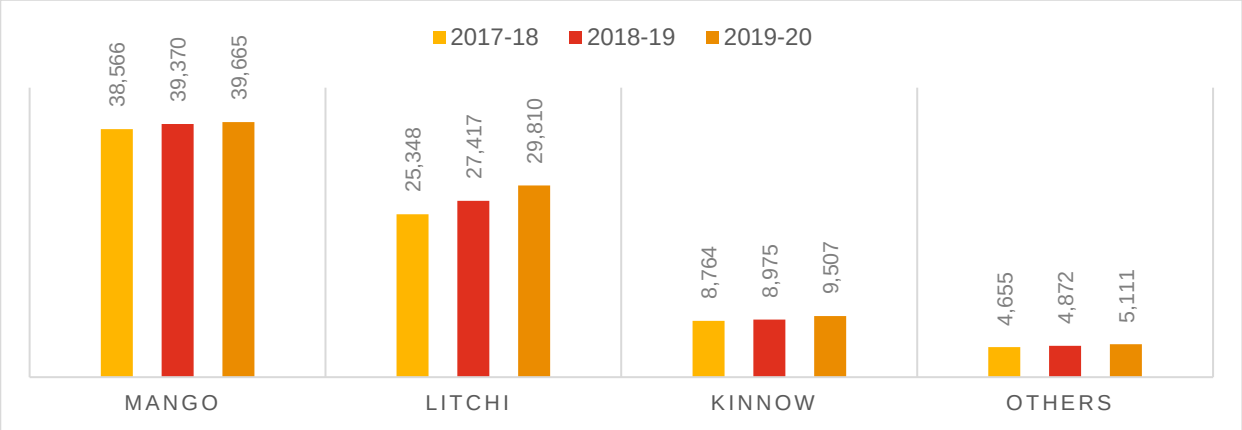
The district produces a wide range of fruits like mango, litchi, kinnow, amla, sweet orange, peach, plum, guava cherry, etc. It tops in the production of mango and litchi in the state. Area under mango and litchi recorded a cumulative growth of 4% and 16% in past three years.



Graph 70: Major fruits and vegetables grown in the district Pathankot (2018-19)

Production trend (MTs) – Fruits

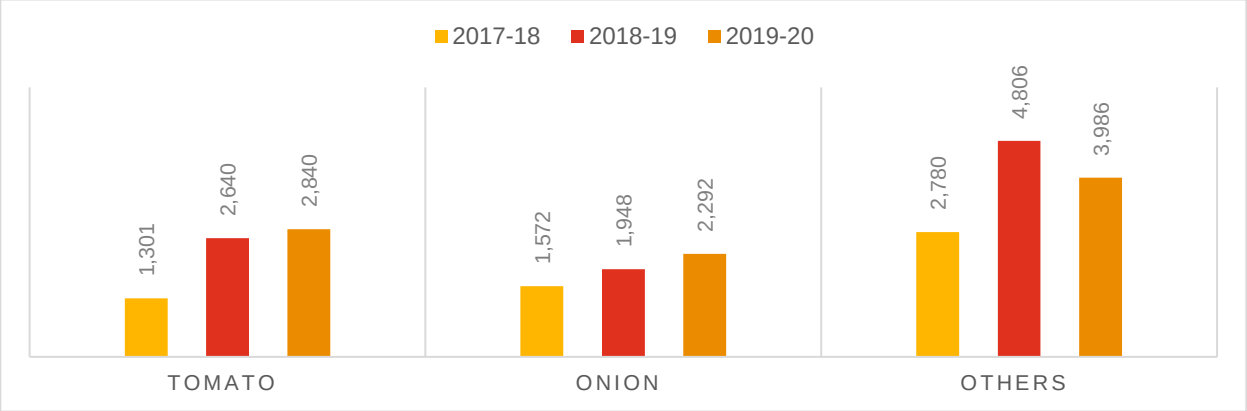
Production of Mango, Litchi, Kinnow has shown an increasing trend over the years in the district.



Graph 71: Production trend of fruit crops in Pathankot district (MT)

Production trend (MTs) – Vegetables

From the graph it is evident that production of Potato and Onion has shown a significant increase over last three years.

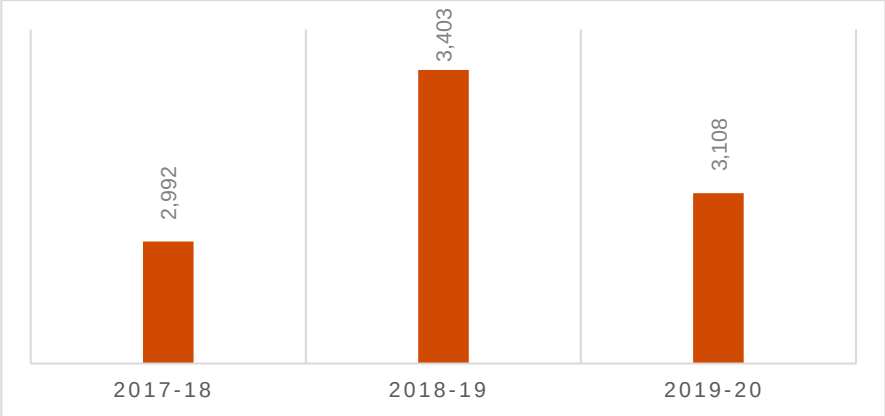


Graph 72: Production trend of vegetable crops in Pathankot district (MT)

4.9.6. Allied activities Profile

Production Trends-Fish

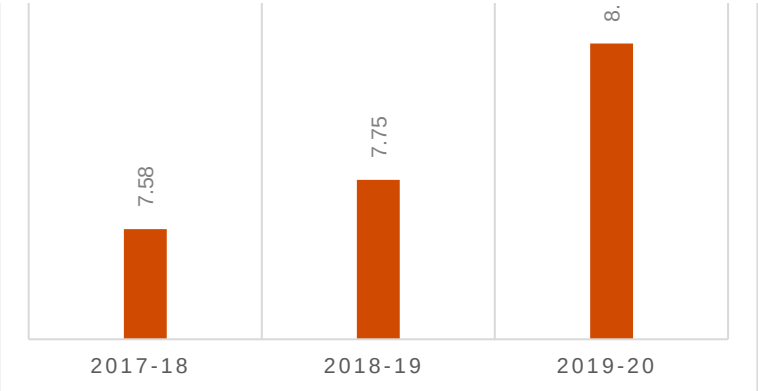
The production of fish in the district is fluctuating between 3,000 to 3,403 MT in last three years.



Graph 73: Production trends of Fish in Pathankot district (MT)

Production Trends- Milk

The district produces over 8 lakh litre/day of milk. After adjusting the quantity for home consumption (about 55% of total production), the surplus production computes to about 3.6 lakh litre.



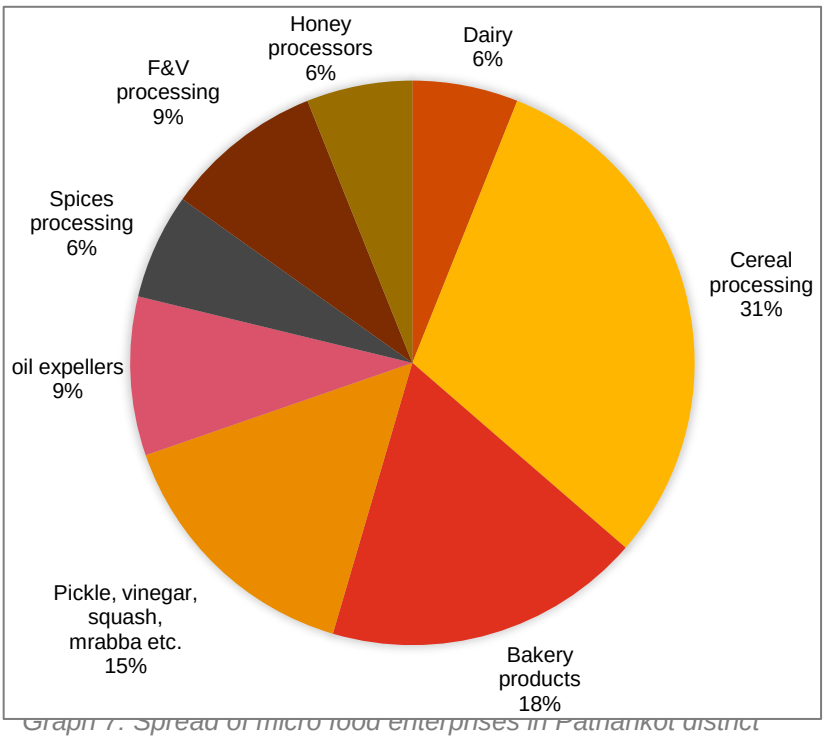
Graph 74: Production trends of Milk in Pathankot district (LLPD)

4.9.7. Industrial profile

Pathankot is basically known as the hub of stone crushing industry in the state. Apart from this, there are many small-scale industries of various types in the city and the region. The area also witnesses Khadi and sericulture Industries, apart from having several brick kilns and agro based industries in the villages.

There are very few Large/Medium scale industries in the district and the same are as follows:

a) M/s Pioneer Industries Ltd, Industrial Growth Centre - Started in 2002
b) M/s Pioneer Agro Extract Ltd, VillgaeTharial (Unit – I) - Started in 1994
c) M/s Pioneer Agro Extract Ltd, VillgaeTharial (Unit-II) - Started in 1996
d) M/s United Spirits Ltd., village Dhekisaindan - Started in 1996



Graph 7: Spread of micro food enterprises in Pathankot district

About 31% of the micro food enterprises are cereal processing (conventional atta chakkis, medium sized modern roller flour mills) in the district. There are about 18% of micro food enterprises are bakery processing. These units are conventional in nature and manufactures bakery products, namkeen, gajak etc.

There are number of individuals, FPOs and SHGs who are in the business of packing litchi, mango etc. for export to other states. Besides, there are individuals and FPOs who are processing fruits and vegetables to manufacture pickles, sherbet, murraba, fruit pulp, etc. About 15% of micro food processing enterprises are into pickle, vinegar, squash, murabba etc. Average investment made by these micro enterprises are Rs. 3.5 lakhs with an annual average turnover of Rs. 7.50 lakhs, providing an average employment of 3-5 persons.

With a view to promote further the cultivation of litchi and improve its post-harvest handling, the government has decided to set-up a Litchi Estate on its existing farm at Sujanpur near Pathankot. The main objective of this estate is to motivate and train the farmers for adoption of litchi cultivation besides imparting the technical knowhow for post-harvest handling of the crop. Physical infrastructure is developed in the estate which include an administrative block and a grading/packing unit. The administrative block houses workplace for officers, experts, and staff besides a training/conference hall for farmers, and an exhibition hall etc.

4.9.8. ODOP

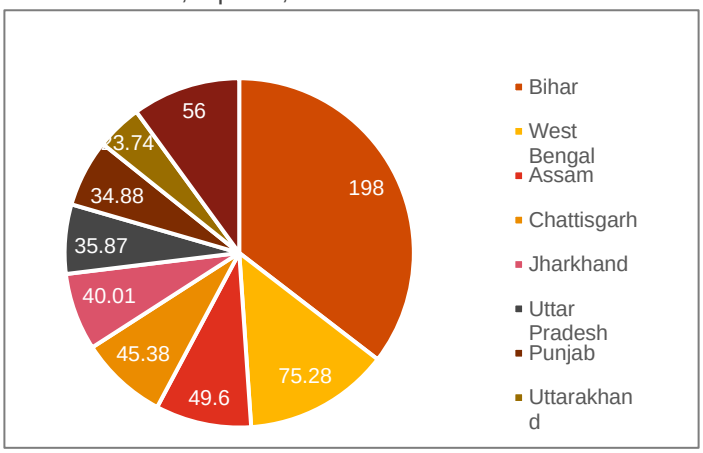
Litchi is selected as ODOP of Pathankot district. In India, It is the most important sub-tropical evergreen tree and belongs to family Sapindaceae.

Litchi fruit is famous for its excellent color, quality, and pleasant flavor. It is an excellent source of vitamin C ranging from 40.2 mg- 90 mg/100g. Besides this, the litchi fruit consists of about 60% juice, 8% rag, 19% seed and 13% skin which varies depending upon the variety and climate under which it is grown. The principle chemical constituents are carbohydrates, organic acids, vitamins, pigments, proteins, fats etc. Litchi fruits are considerably rich in sugar and sugar content varies from 6.74-18.00%. In India, litchi is very popular, and the fruits are in great

demand during the season, which however, is rather too short, lasting about 60 days from April to June. Various processed products have been made from the from the fruit i.e., squash, toffee etc.

National Cluster

In India, litchi is an important commercial fruit crop with tremendous export potential and plays a significant role in our national economy. There has been ever increasing demand of litchi in domestic as well as international market. Owing to specific climatic requirement, the successful litchi cultivation is restricted in certain areas of the country. Presently, it is grown in an area of 82.7 thousand ha, with productivity level of 7.0-8.0 MT/ha.



Graph 8: Major Litchi producing states (in year 2015-16, in MT)

Among different litchi production state Bihar ranks first in production in 2015-16, which occupies more than 40% area and 50% production, followed by West Bengal and Assam. Litchi occupies an important place in the horticulture landscape of Bihar owing to its geographical confinement and the magnitude of its share to the overall production in the county. The soil and the climatic conditions of north Bihar favor high yields with quality fruits of Litchi. Punjab ranks 7th in total production and contribute 6% of the total Litchi production in county.

Clusters in state

In Punjab, the area under the crop has been increased by 46.5% and production of the crop has increased by almost 57%. The productivity is nearly 16 MT/ha Pathankot district is the major producer of Litchi. Other two major districts who are contributing into production are Hoshiarpur 15% and Gurdaspur 16% of the total production of the state.

Department of Horticulture has set up Litchi estate in Pathankot to improve the quality and productivity of Litchi in pockets of sub mountainous area of Punjab, mainly Pathankot and Hoshiarpur districts. Society has been registered and establishment of building and other infrastructure has almost completed.

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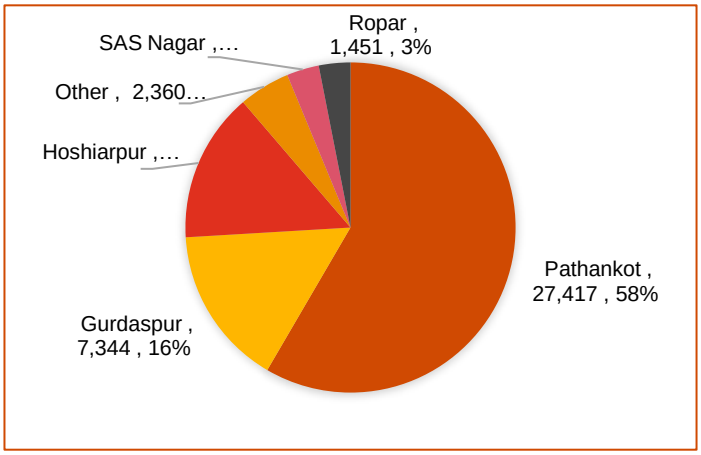
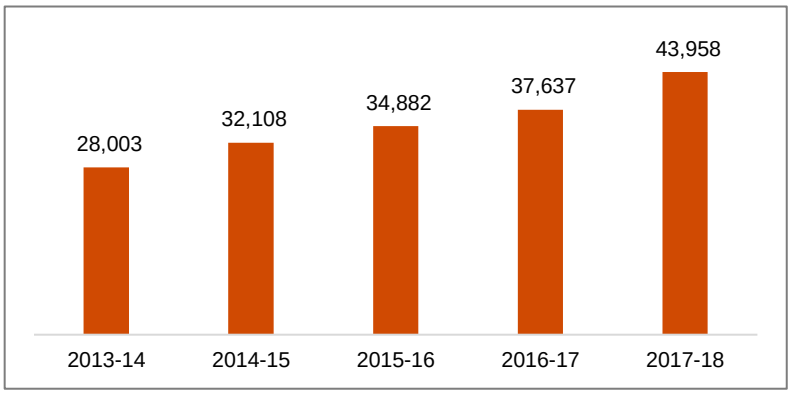


Graph 9: District wise production of litchi in 2018-19 (In MT)

4.9.9. Clusters of Litchi in Pathankot district



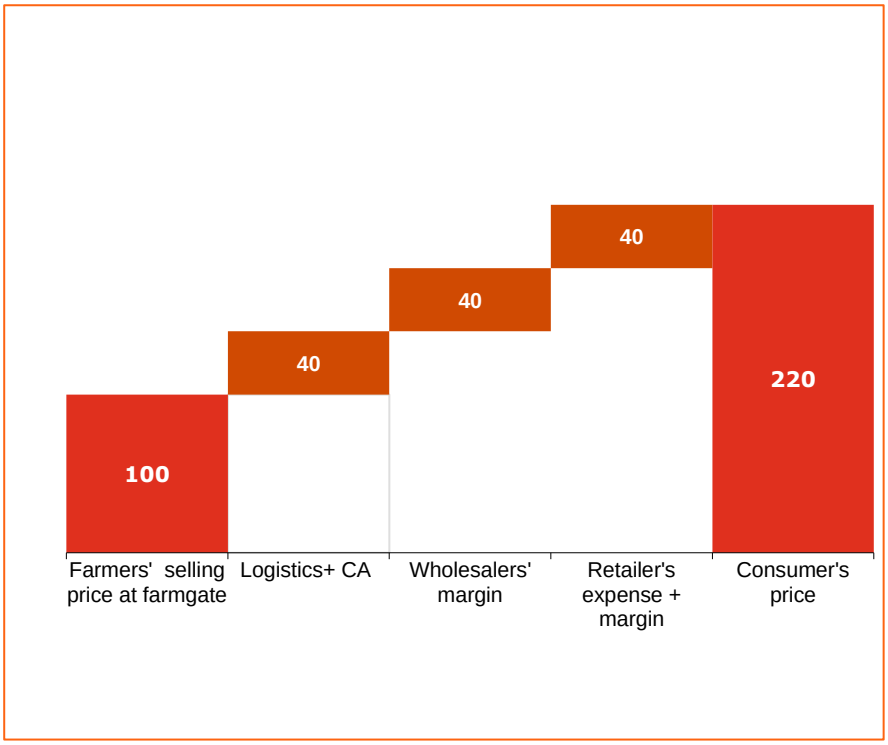
Graph 10: Year wise area and production of Litchi in Punjab

The Pathankot district contributes 56 % of the total area of the state under Litchi and tops in the production of litchi in the state with 58% of total production of the state (2018-19). Dehradun, Kalkata and seedless are major varieties grown in the district. In the district a Litchi grower association is present with 100+ members. In the district the growers/farmers sell their orchard to pre harvest contractor and this practice is followed by 95%-98% farmers. As the shelf life of litchi is very short the farmers must sell it on the same day.
The major Litchi cluster in Pathankot district are Pathankot and Dharkalan. Harvesting season of Litchi is from April to June month for 60 days.

4.9.10. Value chain of Litchi

Most of the contractors sell the litchi fruits as per their convenience. The pre harvest contract system is the most prevailed and acceptable method of litchi marketing as most of the growers prefer it due to obvious reasons however, some of them undertake self-marketing. Growers, who do not intend to market their litchi harvest, give litchi orchards to Pre- Harvest Contractors (PHC) during the month of January. PHC sells the orchard to the wholesale or commission agent, who undertakes the harvesting, packing and transportation of the produce to the market. Self-marketing in the distant domestic market is more profitable with higher net gain but it involves high marketing risk. The commission agents and wholesale merchants play a greater role in the distribution of the produce after purchasing it from the pre-harvest contractors. Some work as commission agents of wholesale merchants, operating from metro-cities, whereas some are financed by merchants and works on their behalf. Few pre harvest contactors also supply the produce to local processing units and export houses. The Pre-Harvest Contractor or the commission agent makes the maximum margin in litchi marketing, as they only perform a transfer function without involving any other cost. The stockist in litchi sale adopts the undercover system and realizes higher margins.

Only the best quality fruits are selected, packed, and forwarded for marketing from the interstate trade while the slightly inferior quality produce is sold in markets within the state. A meager quantity is exported, though, there is great demand and has lot of scope to increase the quantum of export, since the harvesting season is quite different in other parts of the world. Value chain of Litchi is shown in the figure.



Graph 12: Value chain and supply chain of red Litchi in the district. ***(value In Rs per 2 Kg)***

Grading of Litchi:

At farmer level litchi is graded as Grade A, Grade B and Grade C. Grading is done on the basis of

a) Colour (Pinkish- Reddish)
b) Size
c) Taste (Sweetness)
d) Not infested by Litchi Stem Borer

B -grade Litchi are bought from farmers at Rs 5- Rs. 10 less than the price of A- grade Lichi. C- grade Litchi are bought from farmers at Rs.20-25 and generally sold to processing industry.

4.9.11. Challenges in the Litchi value chain in the district

There are many challenges exist in current value chain of Litchi.

f) Lack of proper transportation facility

There is lack of proper cold chain infrastructure for transportation of Litchi. The fruits are transported and handled throughout the marketing chain at normal temperature conditions i.e., without precooling, because of which the market reach is limited to places/ cities which could be covered within 36 hours of harvest since the fruits lose their attractive red colour after 48 hours, rendering the fruits unmarketable.

g) Unavailability of precooling and sorting grading infrastructure at farm level

Litchi is a highly perishable commodity and is harvested during peak summer season. To improve its shelf life, the product must be pre-cooled immediately. However, no such facility is available at the farm level and most of the farmers sell the produce without proper sorting, grading and proper and this is leading to wastage or sale at a lower price.

h) Lack of proper market infrastructure

There is no proper markets place for the producers to sell their produce. Existing markets do not have basic infrastructure such as trading platforms, storage, or utilities. Produce is being transported in pick up vans and is exposed to heat, rain, dust etc. resulting in value loss. Transportation is a key constraint especially during the peak harvesting season. Absence of price information and poor leadership are the constraints in self-marketing of litchi fruits. The major marketing difficulty with litchi involves preserving its attractive red colour.

i) Lack of institutions and branding support

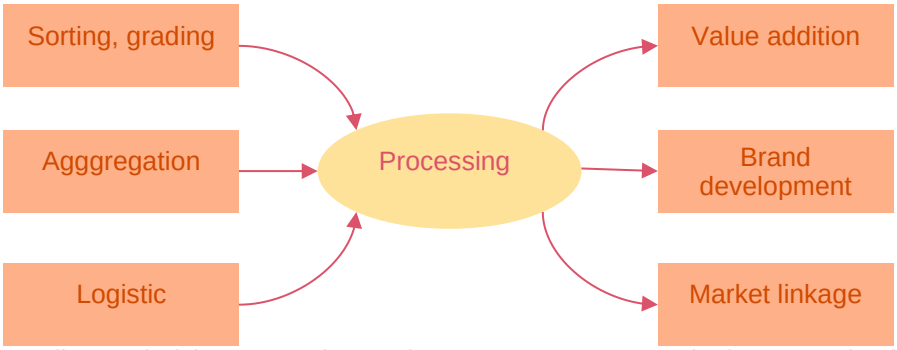
Current scale of production at individual level is very low and no community-based institution like cooperative or FPO is involved. In the absence of a proper scale of production farmers are not able to effectively interact with the market forces and branding of the produce is not done properly.

4.9.12. Suggested intervention and vision

SWOT analysis is presented in the table below:

SWOT analysis for Litchi processing	
Strengths: • Increase in production during recent times. • Seasonal advantage as litchi in Punjab ripens during last week of June.	**Weakness:** • Perishable nature of the fruit. • Lack of efficient marketing channel for the remunerative marketing of the produce • High wastage
Opportunities: • High potential for processing • Potential for export and domestic marketing	**Threats:** • Competition from the other state's produce • Inefficiencies in the supply chain leading to lower margins for the producers.

Suggested model



Soft interventions are proposed to be implemented across the district and would consist of short-term training & exposure visit related to production, post-harvest management and processing/value addition etc. envisaged to enhance the technical skill for farmers as well as technician, extension workers, entrepreneurs, and other operating in the sector. Such interventions are proposed to be delivered through institutions specializing in the subject area.

Hard interventions are majorly being proposed to meet cluster specific requirements based on the assessed need. Hard interventions under the programme shall cater to all the value nodes of the litchi value chain and primarily aim at creating tangible common assets to support the developmental requirement of litchi value chain in Pathankot.

Based on the existing challenges and prevailing conditions in the district, following interventions are required: -

Pre-processing and post-harvest management

Infrastructure for pre-processing and post-harvest management need to be development. The better-quality product get higher price and it help high standard end value added product.

c) Development of farm level pre-cooling centers

Almost 10% of the produce is being wasted at the field level itself as proper pre-colling is not possible. Development of farm level mobile pre-cooling centers (near litchi orchards) and pack houses having sorting, grading and packing facilities is highly required and capacity building of farmers need to be done on various aspects of postharvest management

The pre-cooling centers should also have grading facilities which can grade the fruit depending on the quality of fruit. The packing needs to be done in small baskets by placing sufficient foliage under the clusters and covering with newspaper and litchi leaves for local market. However, for distant market small wooden boxes are required. So, all these infrastructures should be developed at farm level. Mobile pre-coolers be provided for in proximity of the orchards. Such pre-coolers can have a capacity of 2MT/batch. Each mobile pre-cooler can be used for three batches effectively resulting in a capacity of 6 MT/day. These mobile pre-coolers do not require any land and thus may require very small time to be in place. The mobile pre-coolers can be solar powered.

d) **Capacity building and Training for production and post-harvest management**

The producers need to be trained for different aspects like soil testing, post-harvest management, Adequate efforts should also be made towards continuous interaction among farmers, as a part of the soft intervention. The training should also include post-harvest Activities: Including sorting, grading (on the basis of size and colour), packing, storage and transportation and operation and Maintenance of Common Facilities.

e) **Sorting-grading facilities and skill development**

inadequate infrastructure in the cluster for sorting, grading or storage of the produce is resulting in wastage of produce up to 5-10%. Sorting and grading can help in fetching the better price to the producer. Innovative technology need be developed for grading of fruit depending on the extra grade: The extra grade fruits measuring 33 mm diameter and coinciding with nearly 95 % to the specified characters of variety with respect to fruit colour and shape. Nearly, 15-20 per cent fruits only have this character and those can be graded for export purpose.

Grading of fruits is mostly done based on fruit colour and size and for any damage /injury to the fruit. Generally, damaged, and cracked fruits are sorted, and rest are packed as a bunch along with twigs and leaves. The type and size of packaging depends on market preferences and availability.

For better packaging and transportation facilities need to develop. As a usual practice, Litchi is mostly packed in bamboo baskets or wooden crates lined with dried litchi leaves cushioning the produce. Some growers also use plastic crates.

f) Better storage facilities

Better storage infrastructure should be developed because fruits require proper packing and storage. Therefore, to keep the fruits in proper condition on arrival at terminal market, Modified Atmospheric Packaging (MAP) along with Control Atmospheric Storage (CAS) condition need to develop.

The phased marketing of the fruit form cold store shall add more income to the grower since, no other fruit can replace litchi and mango. Litchi fruit treated with 6 percent wax emulsion can be stored in perforated polyethylene bags of 100-gauge thickness in a commercial cold storage (2.2°- 3.3°C) and RH 90-95 percent for one month.

g) Transportation infrastructure and Market place

Litchi fruit is sensitive to temperature and humidity variation. Thus, it is highly perishable and cannot be stored at farm level for more than few days after harvest. Prolonged storage requires appropriate precooling infrastructure. To retain the desired colour and quality of produce, is important for produce to reach the market locations at ambient temperature within 24-36 hours after plucking. As the adequate cooling facilities are absent for direct use by the farmer, they generally tend to immediately sell the produce after sorting and grading to the local traders/processors/ buyers from distant markets. Further up the value chain, very few traders (except the processors) own or have access to cold chain infrastructure and required refrigerated vans for selling the produce in distant bigger markets as Delhi, Mumbai, Chennai etc., that offers premium price.
There is need of development of proximal cold stores, refrigerated vans/ trucks etc. for better transportation and along with these private marketplaces for litchi need to develop.

h) Collective action and branding

There is need to Develop Farmer Interest groups/Producer Groups, which can involve in promoting the organic nature of the produce through sustained campaigns and better branding and marketing through community-based institutions.

4.9.13. Processing and value addition

Preservation and processing of litchi into different products can help growers and entrepreneurs overcome glut and distress sale situation, because the processed products have long shelf life that allows for planned and organized distribution according to market demand.

Very negligible quantity of the litchi fruits at present is being utilized for preservation and processing to get the different products out of the season. Due to short harvesting season, tenderness and perishable nature of fruits, large quantities go waste. There are some branded litchi products. The products like canned litchi and litchi squash are available in the Indian markets. Litchi processing or preservation is a process in which decay or spoilage of fruits is prevented allowing it to be stored in a fit condition for future use. Every region has its own taste or liking, and a care must be taken to understand it and accordingly the recipe has to be finalized. The products like canned litchi, squash, cordial, syrup, RTS (ready to serve), jam, jellies, juice and dried or dehydrated products (nuts) can be manufactured.

Suggested interventions are summarized below:

Process	Gaps/Problems	Solution	Proposed agencies for intervention	Actions under PMFME
Production and Harvesting	• Old Orchards with low density plantation	• Setting up incubation facilities with training & extension services • Capacity building ○ Training on Good	• State Level Technical Institute (SLTI) • National Research	• Setting up Common Incubation Facility near by litchi estate

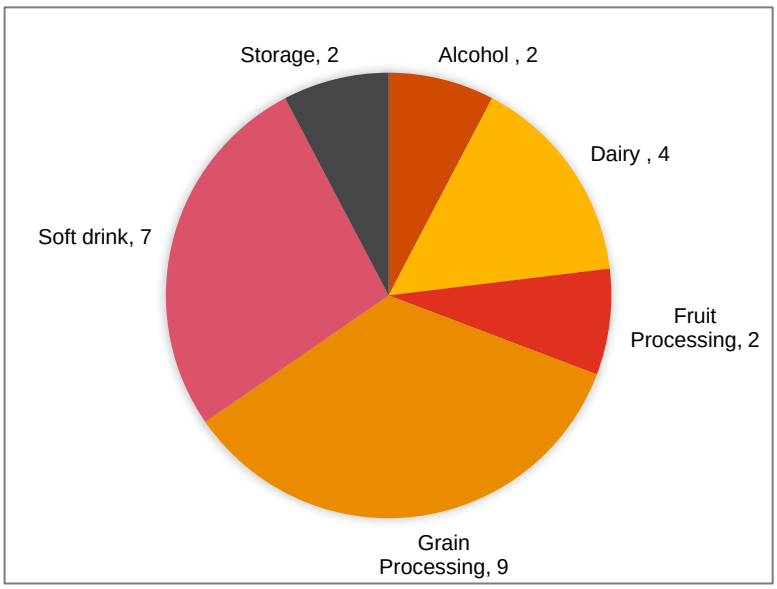
	• Harvesting is labor intensive • Improper maturity index followed	Agronomy Practices ○ Exposure visits to best practices • Promoting high density planting	Centre on Litchi • Tie up with organized players for CSR based interventions	• Research & Extension services through Common Incubation Facility
Farm level primary processing centre	• Lack of farm gate infrastructure Orchard buyers are not setting up any facilities at farm gate • Grading and Sorting is not done at Farm Gate Level • Low packaging and transport facilities • Many times the entire orchard is sold and the harvesting is done by traders/middle men (They also take care of packing and dispatching)	• Product based training for growers • Training on post-harvest management to minimize loss • Training and linking with nearest processors for processing grades of litchi at farmers level • Setting appropriate infrastructure like ○ Shade houses to protect fruit from field heat ○ Primary processing centre ○ Packhouse ○ Mobile sorting & grading facilities ○ Reefer vans for transportation	• National Research Centre, Litchi, • State Level Technical Institute • Self Help Group members • Farmer Producer Organization • SRLM	• Creation of farm level primary processing centre • Creation of packhouse • Training • DPR on creating very small shade house • Mobile grading Units (Feasibility and Utility need to be tested as it is on idea stage on Infrastructure creating at farm level) • Setting up primary processing centres by FPOs/SHGs • Creation of packhouses • Creation of Common Facility Centres, Processing units for canning, frozen pulp • Individual processing units

4.9.14. Non ODOP products in the district

4.9.15. processing industry of Non-ODOP products in district

Study was conducted for 26 food processing units in the Pathankot district. Out of these units 35% are involved in value addition of grain, 27% in the soft drink manufacturing, and 15% in dairy. Only 8% are involved in fruit processing.

Based on production Mango can be second best alternative to the selected ODOP.



Graph 14: Food processing units of Non- ODOP products in Pathankot
Source: FSSAI, analysis PwC

4.10. Barnala

4.10.1. Socio economic profile

District Barnala is a centrally located district bordered by Ludhiana district on the north, Moga district on northwest, Bathinda district on west and by Sangrur district on all other sides. Earlier Barnala was part of Sangrur district , but now Barnala is an independent district. Total geographical area of the district is 1410 sq. km.

Before getting into the current position, earlier and a long time ago Barnala was the capital of Patiala Riyasat, when Patiala became Riyasat at that time Barnala was declared as district headquarters. Barnala lost its pride to a larger extent when Patiala Riyasat Rule was abolished and was mingled into Punjab.

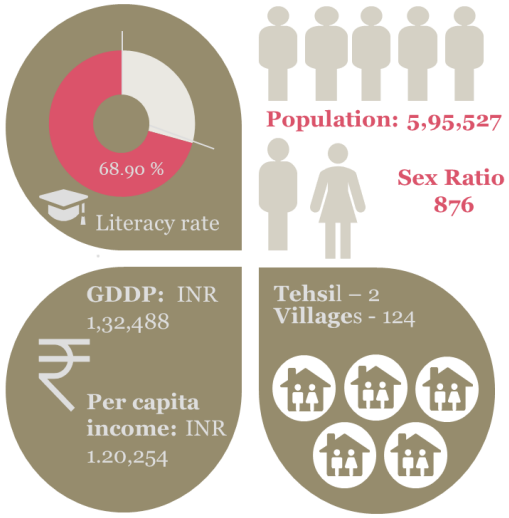
Barnala city is the head quarter of the District. The district is comprising of two tehsils namely Barnala and Tappa. The district has 3 blocks name as Barnala, Sehna and Mahal Kalan The district has 124 inhabited villages.

The district Gross District Domestic Product (GDDP) and per capita income at current price, is marginally more than the state average.

4.10.2. Demographic profile

According to 2011 census Branala district has a population of 5,95,527 persons of which male and female population is 53.32% and 46.68% respectively. Out of the total population, 67.98% of the population resides in rural and 32.01% in urban areas. The district comprises of 124 inhabitated villages.

The district has a sex ratio of 876 females for every 1000 males. The literacy rate of the district is 68.90%.

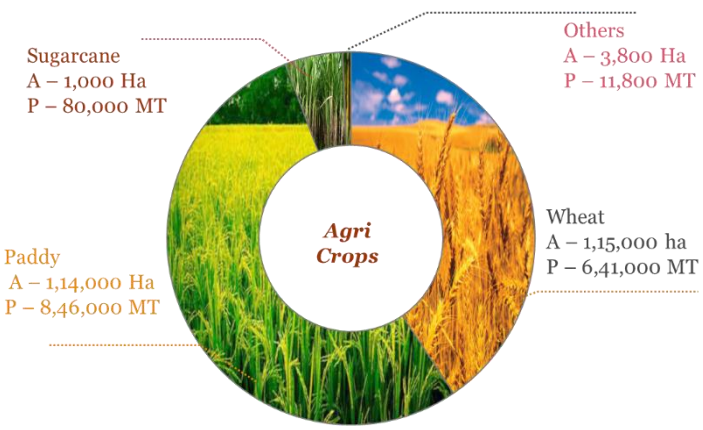


4.10.3. Climate and Rainfall

The climate of Barnala district can be classified as tropical steppe, semi-arid and hot which is mainly dry with very hot summer and cold winter except during monsoon. The normal monsoon and annual rainfall of the district is 434mm and 504mm, respectively. The mean minimum and maximum temperature in the area ranges from 4-5^{0}C to 45^{0}C during January and May or June respectively.

4.10.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is 88%. The district has the cropping intensity of 204%. The second highest after district Kapurthala. The topography of the district is even. It is mostly a plain of alluvial type. It also has loam to heavy loam and sand to sandy loam soils in certain parts of the district. Wheat and paddy are the main Rabi and kharif crops of the district. The district has also grown sugarcane on 1000 Ha.

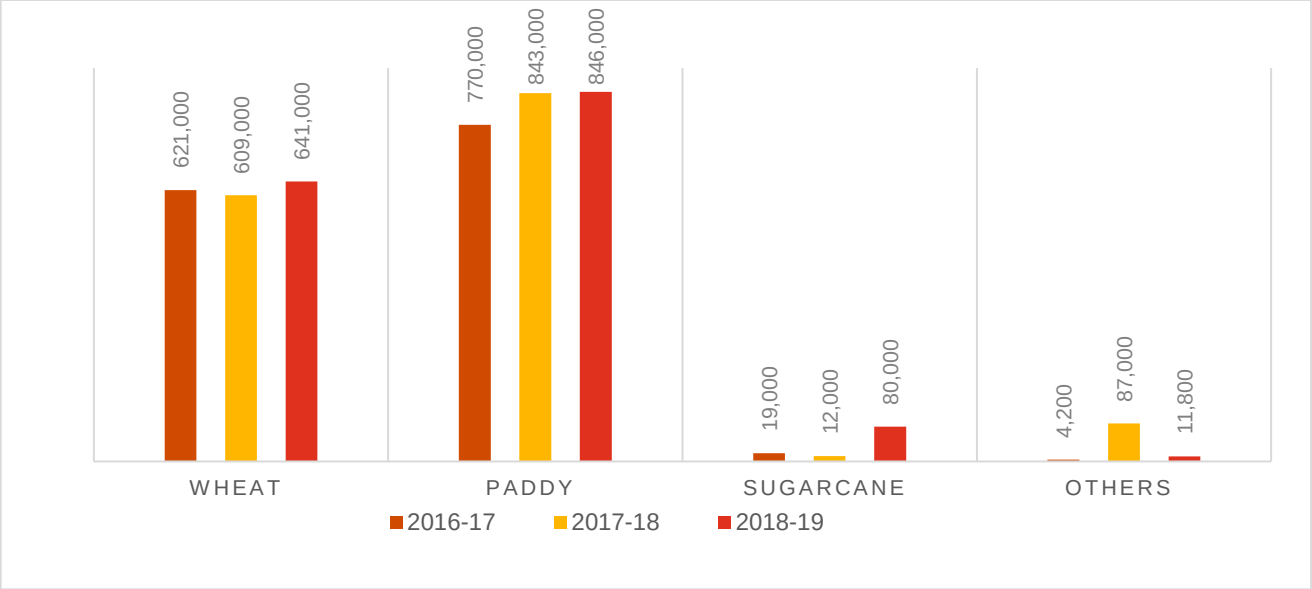


Graph 75: Major Field crops grown in district Barnala (2018-19)

Source: Department of Agriculture, Govt. of Punjab

Agricultural crops production trend (MTs)

Production of Wheat, Paddy and Sugarcane has consistently over last three years in the district.

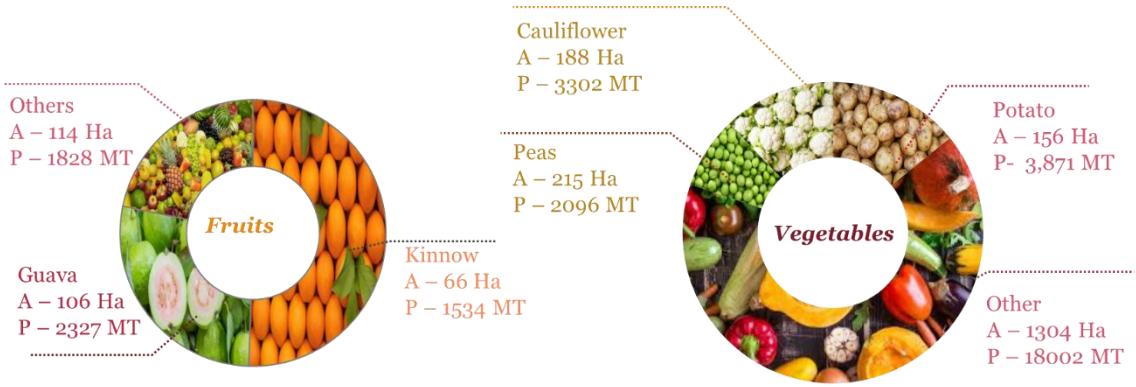


Graph 76: Production trend of agricultural crops in the Barnala district

Source: Department of Agriculture, Govt. of Punjab

4.10.5. Horticulture profile

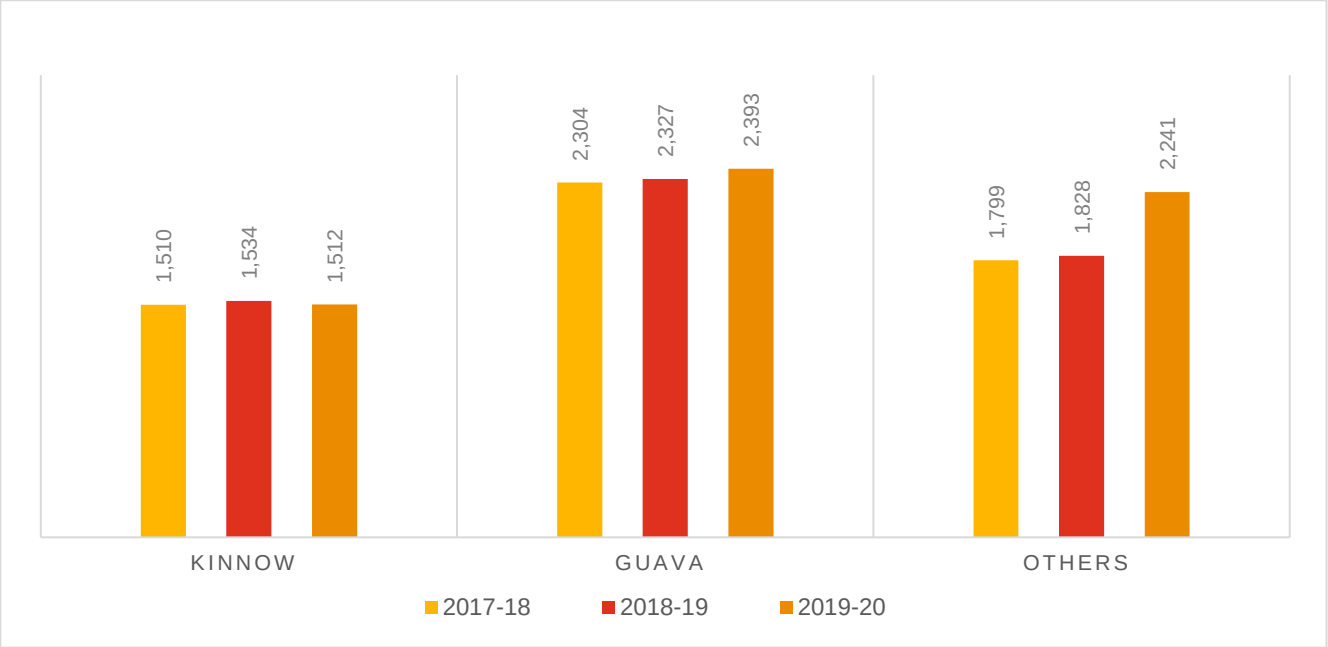
The district produces a wide range of vegetables like peas, vine crops, root crops, potato, brinjal, cauliflower, tomato, chillies, cabbage, okra, garlic, etc. Out of all vegetables, maximum area is under peas. Peas recorded a cumulative growth of 34% in last three years. The district produces a limited variety of fruits like kinnow, guava and ber and that too in small quantities



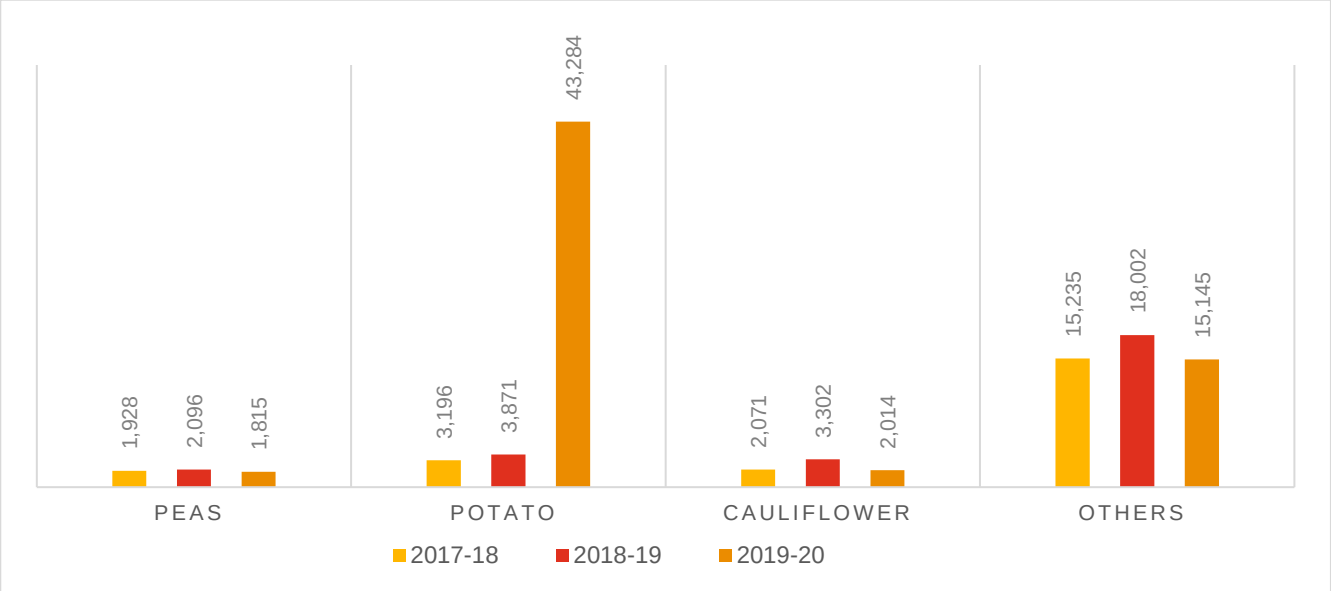
Graph 77: Major fruits and vegetables grown in the district Barnala (2018-19)

Production trend (MTs) – Fruits & vegetables

When it comes to production trends in case of fruits in this district, there hasn't been much change. However, amongst vegetables, the trend of production over the last few years has been quite erratic. Potato production has shown a significant increase from 2017-18 and 2018-19 to 2019-20. From 2018-19 to 2019-20, production has increased by more than 100%.



Graph 78: Production trend in Barnala district of fruits (MT)

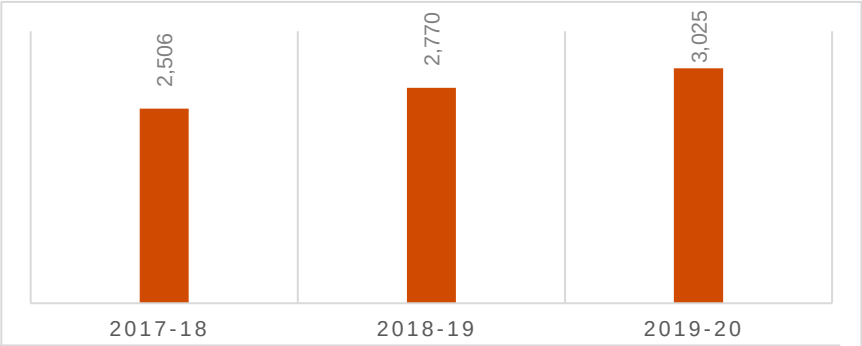


Graph 79: Production trend in Barnala district of vegetables (MT)

4.10.6. Allied activities profile

Production Trends-Fish

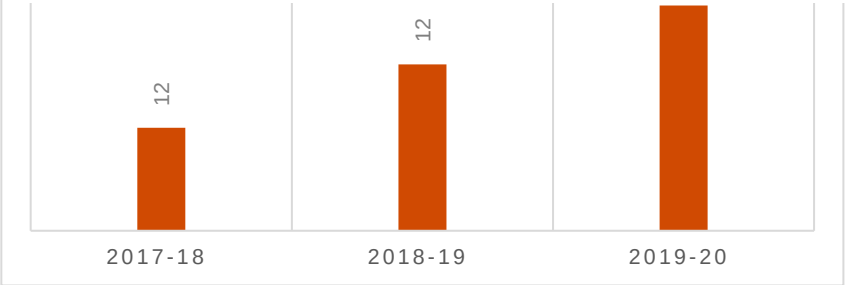
The production of fish in the district is increasing from 2506 MT to 3025 MT in last three years.



Graph 80: Production trend of Fish (MT):

Production trend-Milk

The district produces over 13 lakh litre/day of milk. After adjusting the quantity for home consumption (about 55% of total production), the surplus production computes to about 5.85 lac litre.



Graph 81:Production trends of Milk (LLPD)

4.10.7. Industrial profile

There are 1733 registered Micro Small enterprises in the district and 7 registered medium and large enterprises providing employment to 6928 and 11804 persons respectively, as per FY 2014-15. There are one industrial areas in the district.

Table 12: Industry in Barnala (2014-15)

Sr. No.	Head	Unit	Particulars
1	Registered Micro & Small Units	No.	1733
2	Registered Medium & Large Units	No.	7
3	Employment in MSE Sector	No.	6928
4	Employment in Large and Medium Industries	No.	1180
5	No. of Industrial Areas	No.	Nil
6	Turnover of MSE Sector	Rs. Lakh	53373.26
7	Turnover of Large & Medium Sector	Rs. Lakh	463835.55

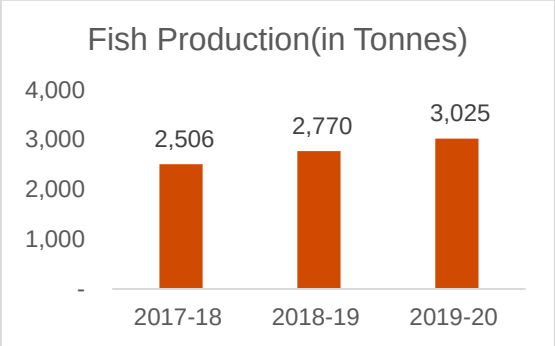
There are over 8 mini flour mills, 500+ atta chakkis, 3 medium size solvent extraction units. There are 365 small rice mills processing paddy for government. Besides, there are about 6 small and micro enterprises processing cotton seed & mustard seed using expellers to manufacture crude edible oil and mustard oil. There are about 50 bakery units in the district.

There is no fruits and vegetable processing unit in the organized sector in the district. However, many Self Help Groups and registered Co-operatives are engaged in the processing & marketing of 'haldi', dalia (Wheat/Jawar/Bajra), honey etc. There is one milk plant in the organized sector by Aneja Foods Pvt. Ltd., Barnala, manufacture Desi Ghee, Butter, Curd, Cheese, Skimmed milk powder and Dairy cream.

4.10.8. ODOP

Poultry meat and fish product has been selected as ODOP of the district.

In the district, there is consistent increase in the production of fish in last three years with 3,025 MT during 2019-20.



There are more than 50 commercial layer farms (about 50 lac birds) and broiler farms (about 20 lac birds) in the district. The eggs are sent mainly to J&K. There is no modern broiler slaughter and dressing plant in the district. There are a large number of meat shops in the district where live bird is cut manually, cleaned and sold to the consumer

4.10.9. Non- ODOP

Based on production milk and bakery can be next potential ODOP of the district

4.11. Amritsar

4.11.1. Socio economic profile

Amritsar the most populous district in the state, is one of the border districts, which share Common boundaries with Pakistan. It is situated in the north-western part of the state in the Bari Doab, a territory situated between Beas and Ravi rivers. The North-Eastern side is bounded by the district Gurdaspur, and towards it South-East across the River Beas lie the districts of Kapurthala and Tarn Taran.

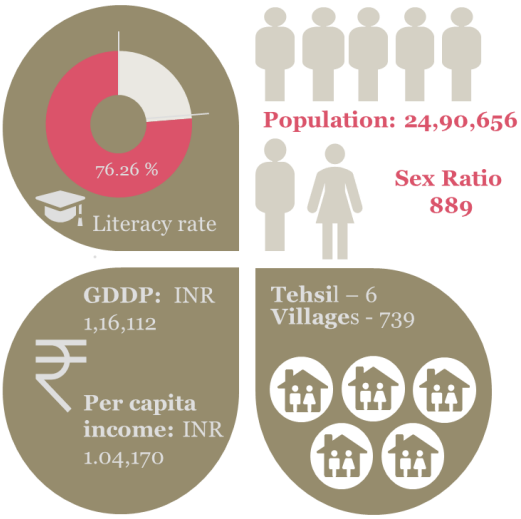
The district is better known as the home of Golden Temple, also called “Hari Mandir” or “Darbar Sahib”. The city, however, derives its name from the tank surrounding the Golden Temple, Amritsar means “The tank of nectar or the tank of immortality”. The shrine and the tank were built by Guru Ram Das, the fourth Sikh Guru, who is the founder of Amritsar city.

The district is comprising of 6 tehsils, Amritsar I, Amritsar II, Ajnala, Baba Bakala, Majitha and Lopoke. There are eight development blocks namely Ajnala, Chogawaan, Harsha China Jandiala Majitha, Rayya, Tarsika and Verka. The major towns of the district include Amritsar, Ajnala, Baba Bakala, Majitha, Attari, Tarsikka, Lopoke, Ramdas Rayya, Chogawaan, Patti, Verka, Jandiala Guru and Harsha China.

The district Gross District Domestic Product (GDDP) and per capita income at current price, is lower then the state average.

4.11.2. Demographic profile

According to 2011 census Amritsar district has a population of 24,90,656 persons of which male and female population is 52.93% and 47.06% respectively. Out of the total population, 46.40% of the population resides in rural and 53.60% in urban areas. The district comprises of 739 villages.



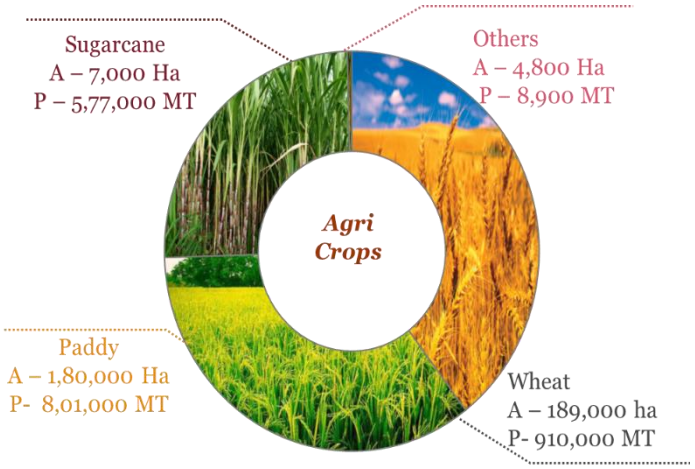
The district has a sex ratio of 889 females for every 1000 males. The literacy rate of the district is 76.26%.

4.11.3. Climate and Rainfall

The climate of the district is classified as tropical, semi arid and hot which is mainly dry with very hot summer and cold winter except during south west monsoon seasonJanuary is generally the coldest month with the mean daily maximum temperature at 18.9c and the mean daily 6 minimum at 4.7^{0}C. The normal annual rainfall of the district is 680 mm.

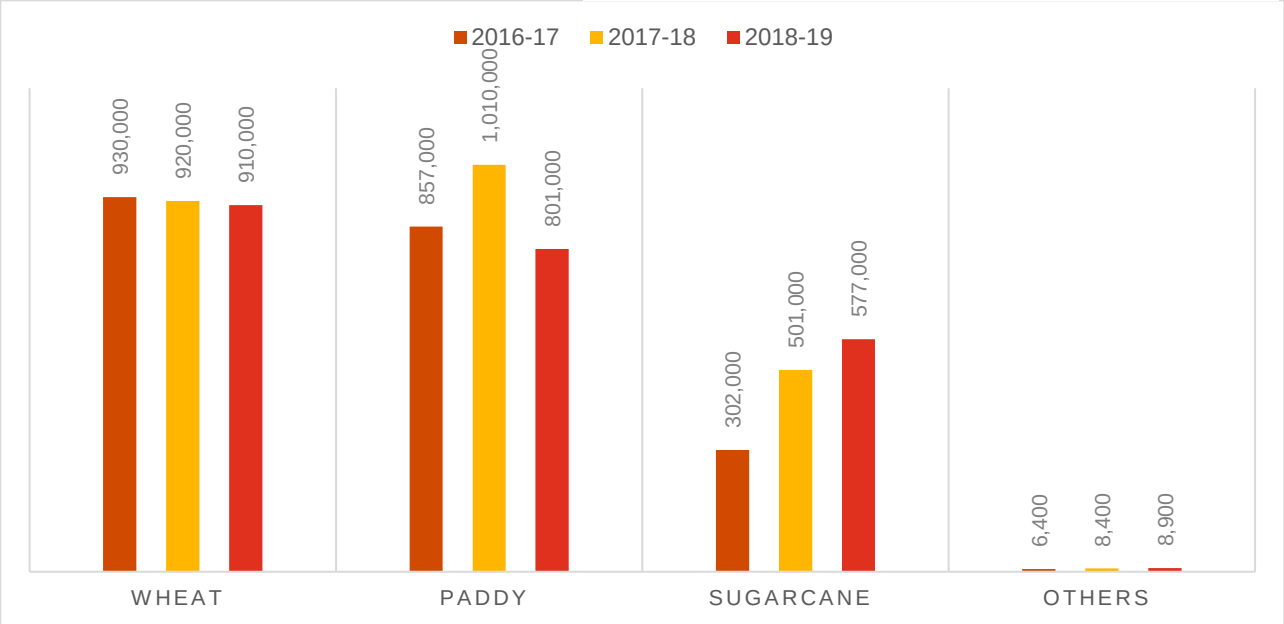
4.11.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is 83%. The district has the cropping intensity of 189%. Wheat and paddy are the main Rabi and kharif crops of the district. The area under the Sugarcane has been increased by 75% in the district in last three years.



Graph 82: Major Field crops grown in district Amritsar (2018-19)

Source: Department of Agriculture, Govt. of Punjab

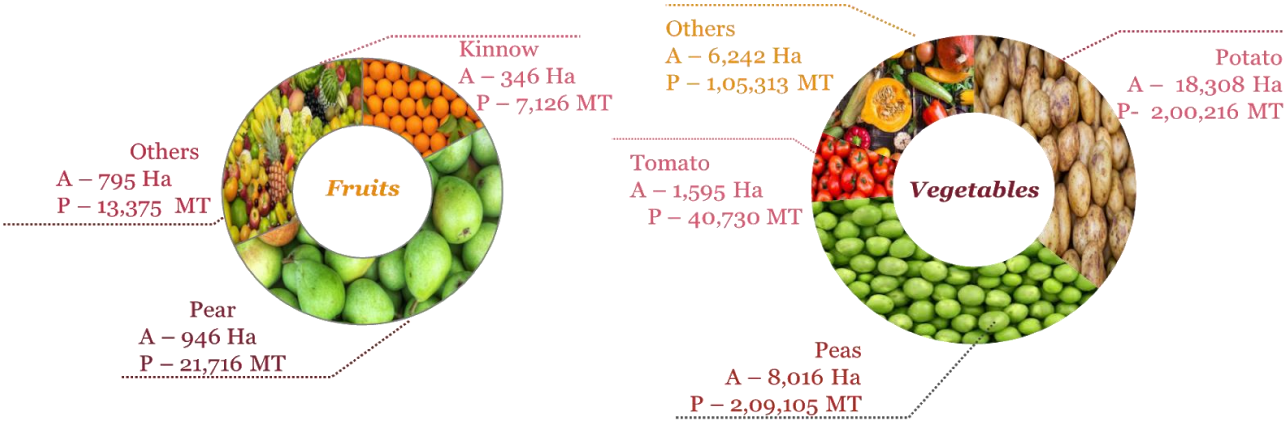


Graph 83: Production trend of field crops in Amritsar district

Source: Department of Agriculture, Govt. of Punjab

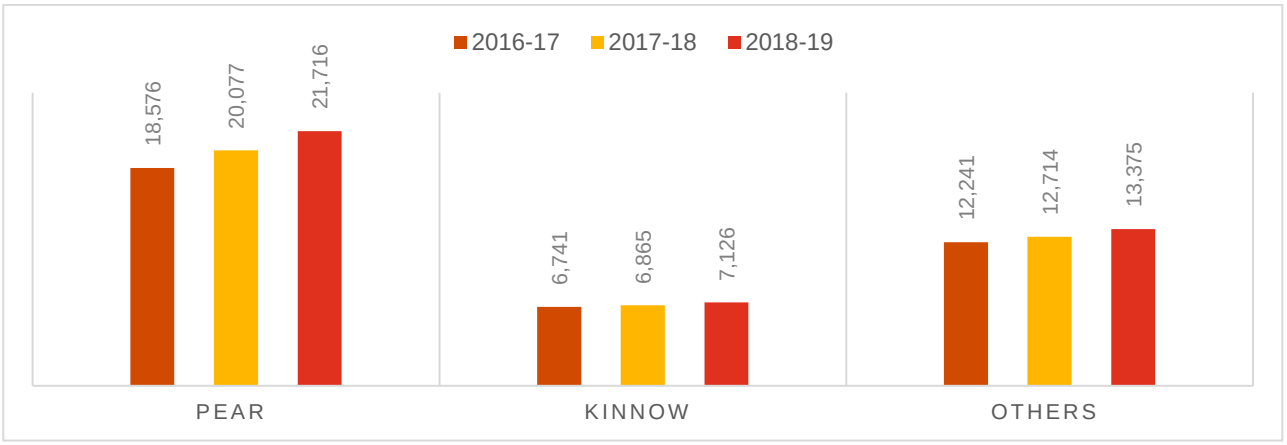
Amritsar district is an important district for the production of vegetables in the state. The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc. and that too in good quantities.

Out of all vegetables, maximum area is under peas. The district tops in the production of peas amongst all districts of the state and contribute 49% of the total pea production of the state.



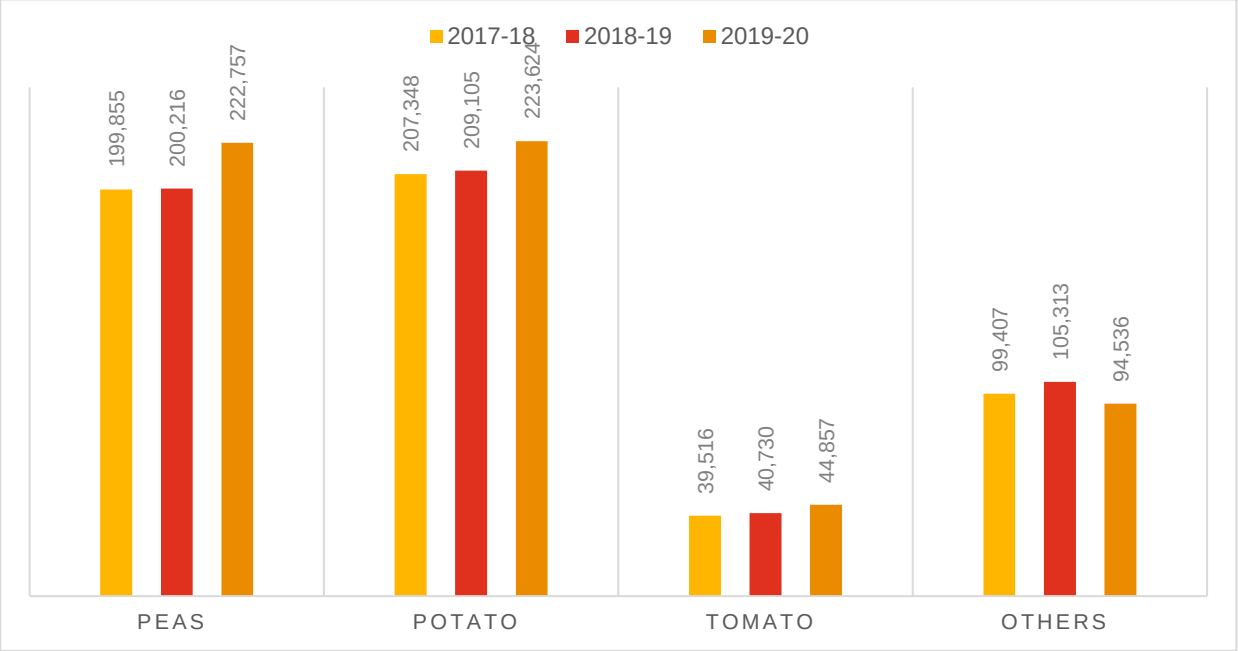
Graph 84: Major fruits and vegetables grown in the district Amritsar (2018-19)

The district produces a wide variety of fruits like kinnow, lime lemon, mango, guava, pear, peach, plum, litchi, etc. in limited quantities except pear. The area under fruits shows cumulative growth of nearly 12% in last three years. The district is the 2nd biggest producer of pear, after district Tarn Taran. Pear recorded a growth of about 17% in last 3 years. The production trend of fruits over the years is depicted below:



Graph 85: Production trend of fuits in Amritsar district (MT)

When it comes to vegetables, most of them like peas, potato and tomato have shown an increase in production in last few years. Production of peas, potato and tomato has grown by 11.46%, 7.85% and 13.52%, respectively from 2017-18 to 2019-20.

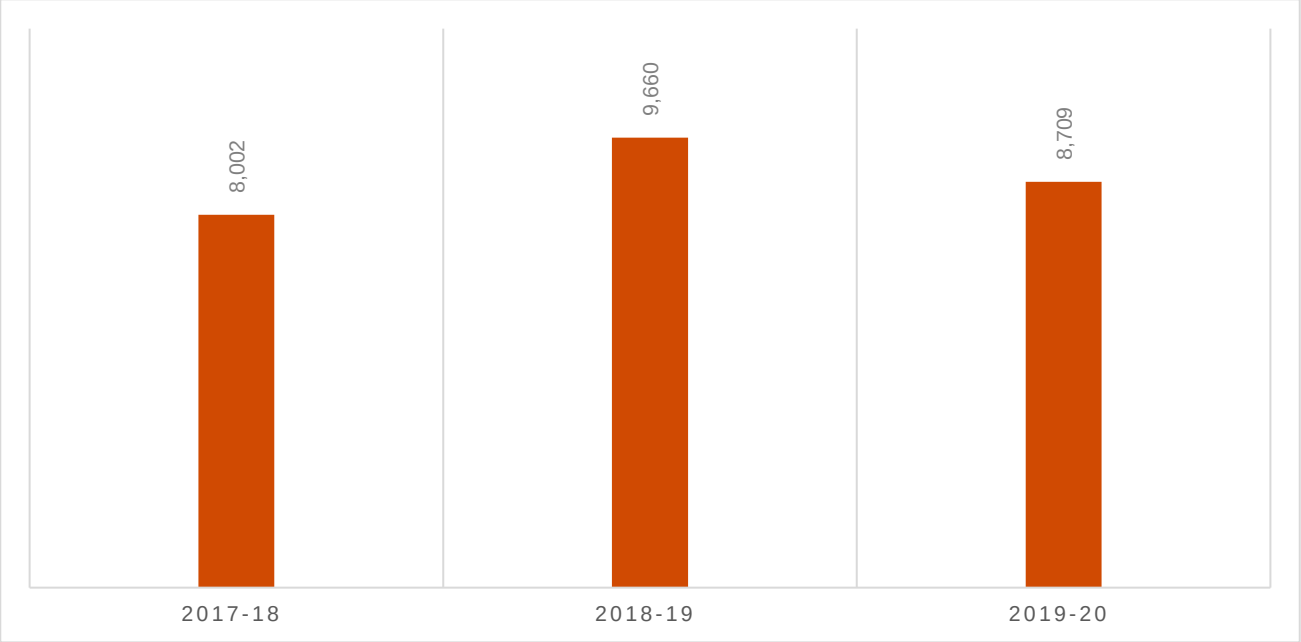


Graph 86: Production trend of vegetable crops in Amritsar district

4.11.5. Allied activities

Production trend – Fish

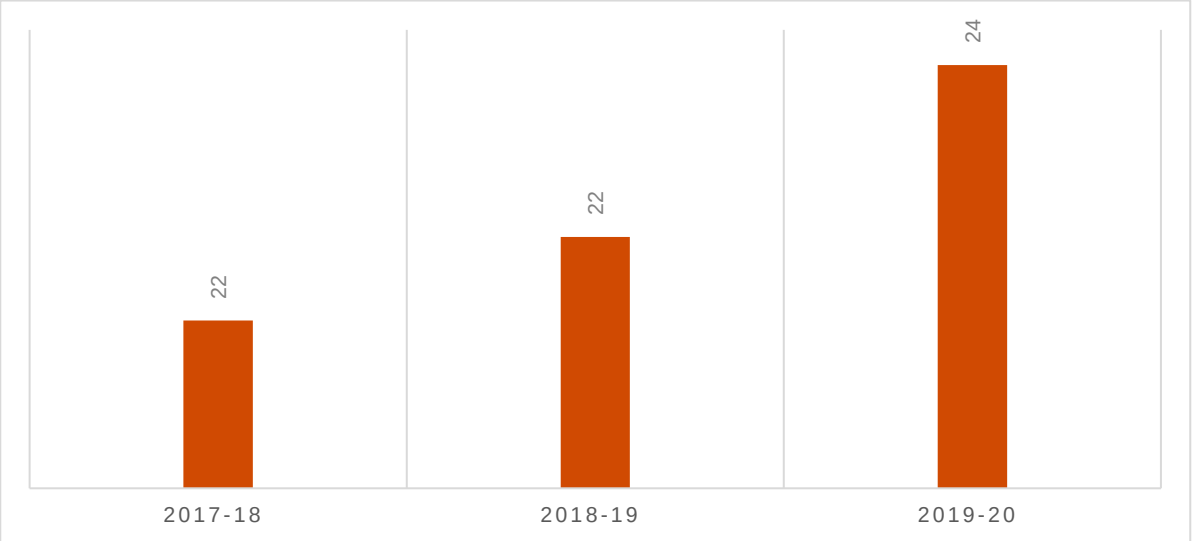
The production of fish recorded an erratic behavior of up and down in last three years with 8,709 MT during 2019-20.



Graph 87: Production trend of Fish in Amritsar district (MT)

Production trend – Milk

The district Amritsar is the 2nd biggest producer of milk at 23.73 lakh litres per day after Patiala. Milk has recorded a cumulative growth of about 9% from 2017-18 to 2019-20. There are 8 to 10 milk processing plants in the organized sector in the district. Many of these plants have their
own arrangement for procurement of milk.



Graph 88:Production trend of Milk in Amritsar district (LLPD)

4.11.6. Industrial profile

There are 13947 registered Micro Small enterprises in the district and 25 registered medium and large enterprises providing employment to 71999 and 5875 persons respectively, as per FY 2014-15.

Table 13: Industry in Amritsar (2014-15)

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	13947
2	Registered Medium & Large Units	No.	25
3	Employment in MSE Sector	No.	71999
4	Employment in Large and Medium Industries	No.	5875
5	No. of Industrial Areas	No.	
6	Turnover of MSE Sector	Rs. Lakh	440439.55
7	Turnover of Large & Medium Sector	Rs. Lakh	478254.66

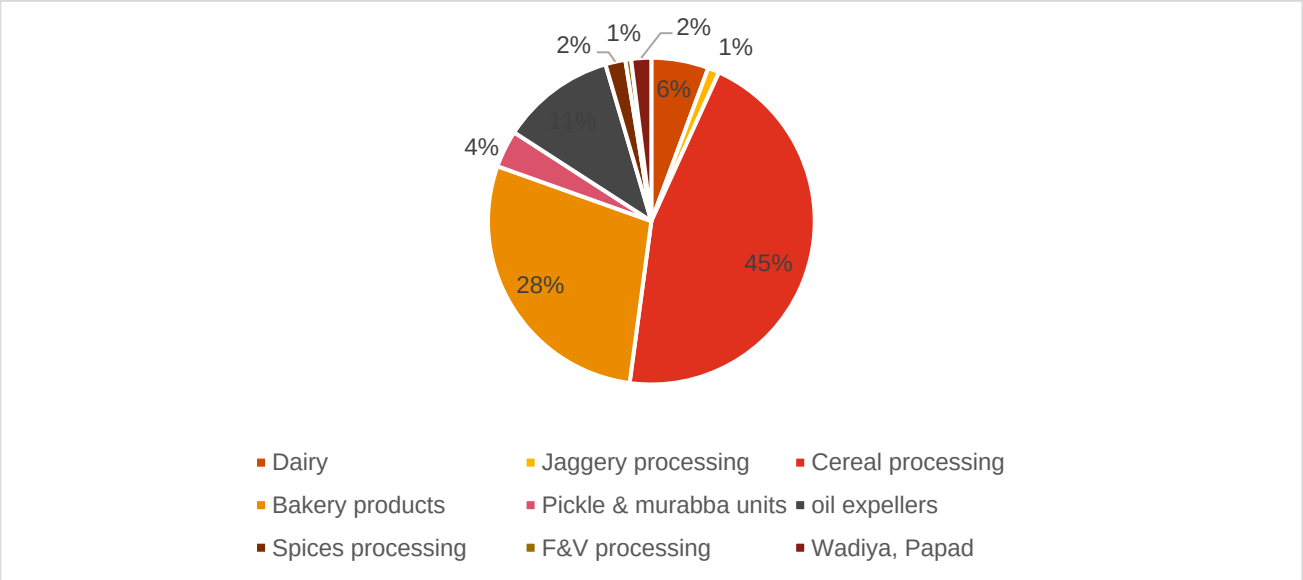
Source: Directorate of Industries Centre, Amritsar

Major food processing units in the district are as follows.

The Amritsar district Cooperative Milk Producers Union Limited, Amritsar: It procures 2.50 LLPD milk through its 82 BMCs and 227 AMCUs at different MPCS.The product range includes Pouch Milk, Ghee, Milk Powder, Dahi, Sweetened Flavoured Milk (PIO), Paneer, Milk cake, Panjiri, Plain sweet & spiced Lassi and Kheer, etc.

Like other districts cereal processing units mainly atta chakki, rice mills are present in more number across the district. There are over 800 flour mills, out of which 8 to 10 are medium sized roller mills and over 20 mini automatic flour mills. There are over 300 paddy shelling units doing milling common paddy for government procurement agencies. there are about 20 medium sized automatic mills processing basmati varieties of paddy.

The district is also the second highest producer of the milk after Patiala. There are 8 to 10 milk processing plants presents in the organized sector in the district. Besides, there are 4 to 5 milk chilling centers having capacities ranging from 25,000 litres to 50,000 litres operated by sole proprietors and partnership firms. Then, there are over 150 small and micro enterprises, including 'sweet meat' manufacturers. The district bakery units. A



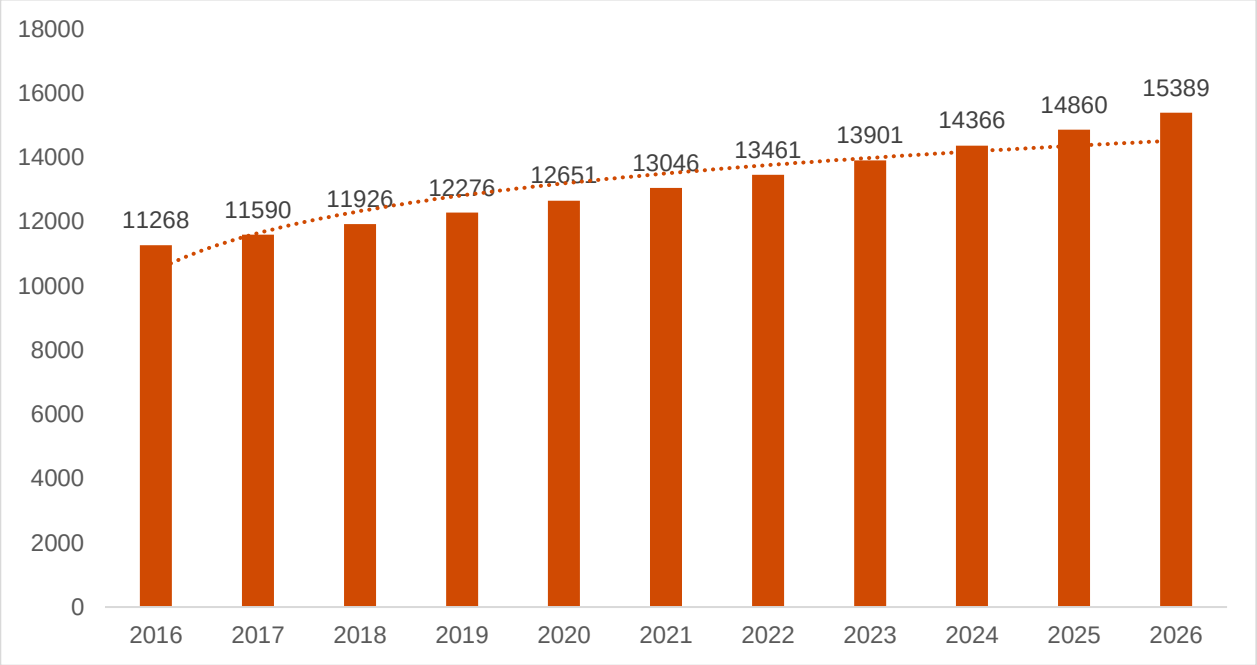
Graph 89: Spread of Micro food enterprises in Amritsar district

Source: Primary Survey

4.11.7. ODOP

The global pickles and pickle products market was valued at USD 12651.1 million in 2020, and it is projected to reach USD 15,388.9 million in 2026, growing at a CAGR of 3,36% during the forecast period (2021-2026)[36].

[36] Report on Global Pickles & pickle products market (2021-2026), Mordor Intelligence



Graph 90: Pickles and Pickle products market (Revenue in USD million)

Vegetable pickle segment accounts for the largest market share valued at USD 7666.1 million in 2020, and it is estimated to grow by CAGR 2.2%. By distribution channel, supermarkets/hypermarkets occupied the largest market share and was valued at USD 6971.6 million in 2020 at a CAGR of 3.61% during the forecast period. The fastest-growing segment in distribution was online retailers at a CAGR of 5.77% during the forecast period.
By geography, Asia-Pacific held the largest market share, valued at USD 4730.2 million in 2020, with a projected value of USD 6117.7 to reach in 2026. The region also registered the fastest growth rate of 4.43% CAGR during the forecast period.[37]

Pickle and pickle products vary as per local taste and preferences, and thus, many international players, as well as regional, are succeeding in this market by catering to the personalized needs of consumers. Brands, like Nilon's, are promoting their products with tag lines, such as "Mumma's best-kept secret," to attract more consumers looking for homely taste in processed pickles. Moreover, brands are also making pickles with minimum preservative quantity to cater to health-conscious consumers.

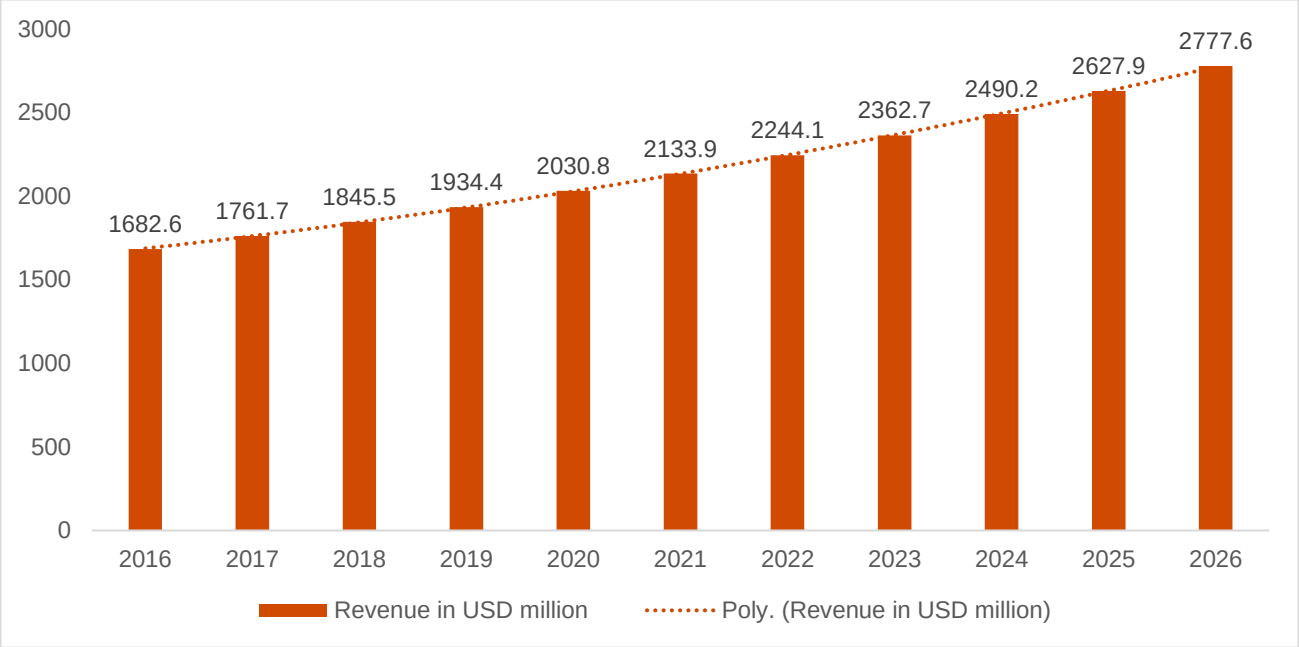
Asia-Pacific remained the largest pickle-consuming region as pickles are native to Asian countries, primarily India, having much greater product recognition along with the presence of numerous small-scale players here when compared with other developed regions.

4.11.7.1. Clusters of Pickles and Murabba:

4.11.7.1.1. National Clusters

The Indian pickles and pickle products market was valued at USD 2,030.8 million in 2020, and it is projected to reach USD 2,777.6 million by 2026, registering a CAGR of 5.41% during the forecast period.

[37] Report on Global Pickles & pickle products market (2021-2026), Mordor Intelligence



Graph 91: Year wise revenue of pickle and pickle products market in India

Source: Report on Global Pickles and Pickle Product market, Modor Intelligence

Pickles and pickle products remain an essential affordable condiment in the Indian households, and over the years, there has been an emergence of numerous local, as well as global players in the country, expanding their production facility to meet the demand of the increasing population of the country. However, local manufacturers hold a dominant position in the Indian market. For instance: Mother's Recipes (India's biggest pickles brand) manufactures 2 lakhs pouches and bottles of pickles every day and holds more than 20% in the Indian pickles market.

The most common pickle known to Indians is aam ka achar, the mango pickle. The second most famous pickle is made of lemon. However, in different parts of the country, different ingredients are used to make pickles because India has so many indigenous varieties of fruits and vegetables. Each region has its favorites, and their preference also changes seasonally. The market is highly dominated by traditional pickles.

Furthermore, Indian consumers are highly price-sensitive, and there is a consistent evolution of small-scale private labeled brands in the country. Thus, distinctive marketing strategies, such as competitive pricing, wide visibility and availability, and attractive discounts are expected to be profitable for new market entrants. Some of the popular pickles brands in the Indian market include Nilon's, MTR Foods, Natureland Organics, First Bud Organics, Mother's Recipe, Double Horse, and others.

4.11.7.1.2. Clusters within the state: Amritsar

Amritsar district is known for its Murabba and Pickle across the country. Most of the unit is concentrated in Mishri Bazaar area of the Amritsar city. Each unit has a retail outlet outside the unit and processing facility inside it. Pickles manufacturing is also done by some of the Self-Help Groups at village level. Most of the raw material comes from neighboring states/districts. Carrot and seasonal vegetables used for pickle manufacturing is procured from the district. Amla which is the major raw material is procured from Rajasthan, Himachal Pradesh Uttar Pradesh etc. Raw material prices increase due to transport charges. Manufacturing of ODOP is primarily manual with little mechanization. Some of the units uses piercing machine for Murabba. Seasonal labours are involved in the processing of pickle and Murabba. Wide varieties of Pickle and Murabba are manufactured in the district. List of Pickle ad Murabba manufactured in the district is given in the table below;

Name of the Product
Murabba: Amla Murabba, Carrot Murabba, Apple murabba, Ginger Murabba etc.
Pickle: Lemon Pickle, Garlic Pickle, Chilli Pickle, Tehu Pickle, Mango Pickle, Mixed vegetable pickle

Wholesale prices of the product is dynamic in nature and depend on the demand and season. Average wholesale prices of the product are given in the table below;

Name of the Product	Packaging Size (gram/kg)	Wholesale Selling Price (Rs.)
Murabba	1 kg	50-80
Pickle	1 kg	30-100

4.11.7.1.3. Turnover & employment of the ODOP producers

The district is home for more than 60 micro food enterprises involved in Pickle and Murabba manufacturing which provides employment to about 700. Individual turnover of these processors ranges 15-20 lakh to 1 cr per annum. from Estimated market size of the Pickle and Murabba traded from the district is INR 60 crores. Other than this, there are multiple processors involved in the processing of ODOP products at very small scale usually doing the processing at household level. There are around 20 SHGs involved in the processing of pickle and murabba. The owners of units in Amritsar have also formed an association under the name '**Amritsar Achhar Murabba Association'.**

4.11.7.1.4. Socio economic profile of the ODOP producers

Most of the processors involved in the processing of pickle and murabba comes from average economic background. Usually, they have been involved in the processing of ODOP since a long time. They have decent education and most of them came into the profession through hand over the business from earlier generation. The economic returns from the overall processing are diminishing due to intense competition and entry of larger players.

4.11.7.1.5. Infrastructure and Technology

Amritsar district is well connected by the road and rail network. There is one international airport in the city of Amritsar. Other infrastructural aspect like power availability, transportation is also good as the state as a whole has one of the best infrastructure in the country. Although the basic infrastructure available in the district is good, but there are many issues at the firm level infrastructure. Most of the firms carry out the operation through manual means and are smaller in size. Access to advanced machinery and technology is very limited and firms are unable to upgrade due to lack of access to capital. During discussion with processors, it was found out that lack of access to modern technology result in substantial wastage. Manual and traditional processes are employed for the manufacturing of murabba and pickle by these micro units. Maintaining the hygiene and fulfilling the safety regulatory requirement is also one significant challenge as these units don't have any formal training and technical know-how in this aspect. Along with production , packaging is another important challenge resulting in the impeded growth for these units. Most of them don't have packaging advanced packaging structure. These infrastructural issues are have resulted in limited growth for these units despite having good clientele base.

4.11.7.1.6. Human resource and skill set

The pickle and murabba industry creates significant employment opportunities as more than 600 people are directly employed by these units. The human resource employed by these units does not have any specific skill sets. They are involved in the manual operation and learn the skills through working. They don't have the exposure and experience in maintaining hygiene and meeting food safety regulatory requirements.

Pickle and murabba processing units provide seasonal employment usually for 4-5 months in a year. Unskilled workers are paid usually at the rate of Rs 10,000-15,000/month. From discussion with the units, the training and

capacity building of the staff on better manufacturing practices, safety and hygiene and emerged as one of the most important requirement.

4.11.7.1.7. Institutional support and support infrastructure

The pickle and murabba industry in Amritsar has gained great reputation for its quality product. The processors have formed association under the name '**Amritsar Achhar Murabba Association'.** The processed food exporters and agents of Herbal and Unani products from various parts of the country source their requirement of achhar, murabba and sherbet from Amritsar and neighboring districts. The good connectivity of the Amritsar district results in better outreach for the processors. As such no support structure is available for the industry. No common infrastructure is available in the city and nearby areas where processors can go and utilize the facility. Testing facilities are also not available in the district or nearby areas.

During discussion, it was observed that a facility in the form of common incubation center can greatly help the processors in accessing advanced machinery without making heavy capital investment. It can help in leveraging the skills of existing processors for increasing the production in the district.

4.11.7.2. Food safety standards

As per Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011, pickles means the preparation made from fruits or vegetables or other edible plant material including mushrooms free from insect damage or fungal infection, singly or in combination preserved in salt, acid, sugar or any combination of the three. The pickle may contain onion, garlic, ginger, sugar, jaggery, edible vegetable oil, green or red chilies, spices, spice extracts/oil, lime juice, vinegar/acetic acid, citric acid, dry fruits, and nuts. It shall be free from copper, mineral acid, alum, and synthetic colors, and shall show no sign of fermentation.

Pickles in citrus juice/Brine conforming to the following requirements	
Drained weight	Not less than 60.0 per cent
Sodium Chloride content when packed in Brine	Not less than 12
Acidity as Citric Acid when packed In Citrus Juice	Not less than 12

4.11.7.3. Packaging

A very high quantum of polymeric materials, glass jars, besides cellulosic and Aluminum foils are used for packaging items. Paper board and metal containers are also used for certain applications. Although a variety of packaging materials are available, the ultimate choice of the wrapper depends upon the required shelf-life, performance on the wrapping machine and the cost which is purely based on the segment of the market targeted by the manufacturer. The most common choice of packaging medium is plastic (generally flexible) as it provides the required protection and preservation, grease resistance, physical strength, machinability and printability. Plastics being lighter in weight are, therefore, the most preferred material for packaging of Pickles.

There are many changing trends in the packaging of Pickles. Plastic films and their laminates are increasingly replacing waxed papers due to better properties and aluminum foil laminates due to price and better flex crack property. Depending on the type of package i.e. twist wrap, pillow pack and vertical flow pack or roll pack, the plastic-based packaging films used for pickles.

Types of Packages

- Pillow Bags and Pouches-Another common type of packaging is a pillow pouch or bag. The bags get their name from their shape, which resembles a pillow. They are found lying flat on grocery store shelves and have been known to hold mini chocolate bars and individually wrapped dates.

- Reclosable Zipper Bags and Pouches-Reclosable bags and pouches are essential for Date products because they give customer convenient access to their goodies while preserving freshness. Zipper closures let customers use portion control or take their dates on the go.
- Flexible Pouches-Flexible pouches are a great option for holding processed Dates and other Fruits. They can be manufactured with zipper-seal closures, which help keep the interior contents fresh for use. Flexible pouches offer amazing printing capabilities, so you can add your attractive product branding to the pouch itself. Many pouches stand up on their own, which helps you improve your shelf appearance.
- Earthen Pots-Clay pot's porous nature lets both moisture & heat to circulate through the food those results in slow yet aromatic dish. Earthen pots also retain the nutrition of the food that is usually lost in other types of utensils. The thermal inertia in earthen pots keeps the meat tender and soft for long.
- Glass Jars- Using a pickle glass jar has its advantages and health benefits. Pickle glass jars have been a popular choice over the years and are found in different colors and styles. This is a huge advantage when it comes to storing pickles. Glass is a non-porous which resists dirt and hence is easily cleaned. Pickles remain fresh longer in the glass jars than if you store them in plastic or metal jars. Glass is inert hence you will not ingest chemicals unlike when you store these pickles in plastic or metal jars or bottles.

4.11.7.4. Labelling Standards

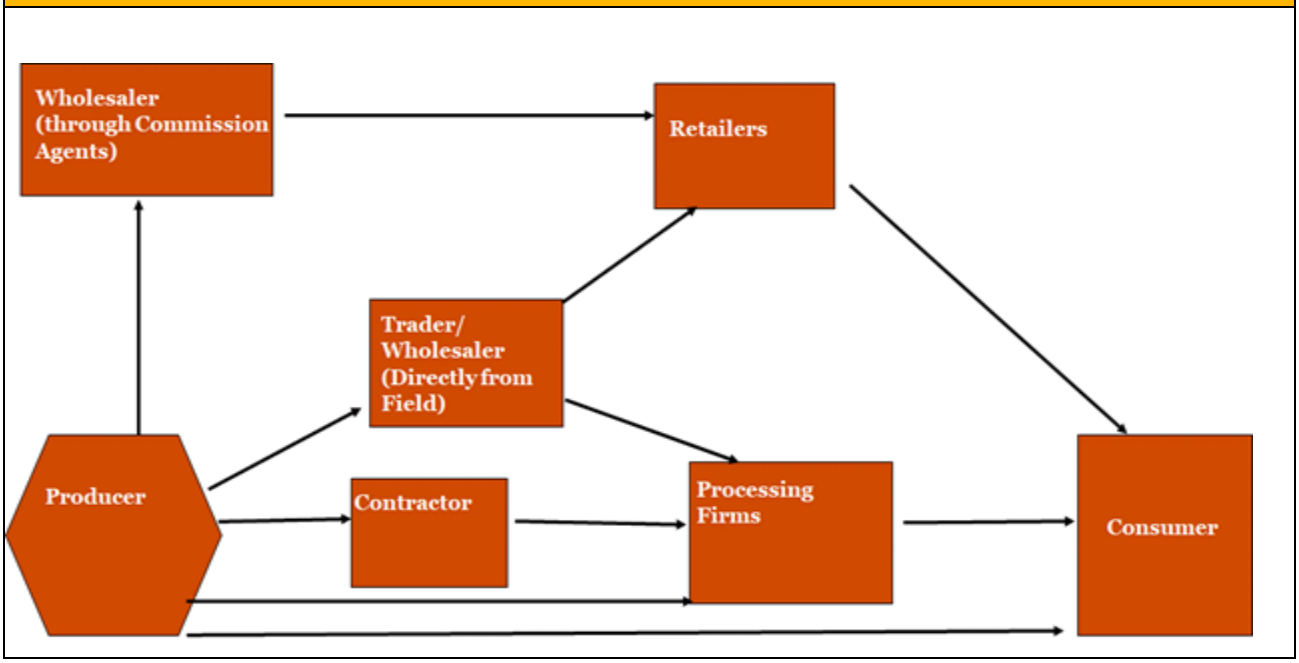
Labeling requirements for packaged food products as laid down in the Part VII of the Prevention of Food Adulteration (PFA) Rules, 1955, and the Standards of Weights and Measures (Packaged Commodities) Rules of 1977, require that the labels contain the following information:

- Name, trade name or description
- Name of ingredients used in the product in descending order of their composition by weight or volume
- Name and complete address of manufacturer/packer, importer, country of origin of the imported food (if the food article is manufactured outside India, but packed in India)
- Nutritional Information
- Information Relating to Food Additives, Colors and Flavors 6. Instructions for Use
- Veg or Non-Veg Symbol
- Net weight, number or volume of contents
- Distinctive batch, lot or code number
- Month and year of manufacture and packaging
- Month and year by which the product is best consumed
- Maximum retail price

4.11.7.5. Value chain actors

The local traders or auctioneers and commission agents perform the function of aggregators who procure from small farmers and sell it in mandi. Large farmers sell directly to local mandi without the help of agents. The wholesalers buy from mandis, transport and sell to retailers at different locations.
Processors procure the vegetables from the local mandis, APMC or from agents (supplying vegetables from different states). The processors meet their requirement of fruits and vegetables from APMC as well as from other states like Himachal (golden apple), J&K (royal &amri varieties of apple), and UP(Amla) etc. Carrot, Tomato, Cauliflower, Pear, Mango etc. are sourced from within the district. The processed product is sold to wholesalers and retailers. The processors also sells pickle and murabba directly to consumers in small packaging size of 500gm to 1 kg from their own retail chain. Few processors also processes the produce for other big players like Patanjali.

ODOP Value Chain



4.11.7.6. Market demand of value-added products

According to a report published in March 2018, the global pickles and pickle products market is expected to register of CAGR of 3.2% during the forecast period, 2018 to 2023. There is a moderate level of competition in the global market as the industry is scattered. Pickles by regional players using local products are preferred in the market. It is relatively easy for new entrants due to the trend of customer shifting from one brand in India include Aachi Foods, MTR foods, NEO Foods & craft foods.
The increasing urbanization and income offer huge scope for marketing of Pickles. Urban organized platforms such as departmental stores, malls, supermarkets can be attractive platforms to sell well packaged and branded dates. Processors can also have tie-up with hotels, caterers and restaurants for supply.

4.11.7.7. Major Issues faced by micro food processing enterprises of the ODOP

The micro food processing units involved in the pickle murabba processing faces multitudes of challenges. Following are the major issues which are impeding the growth of these micro food processing units.

- *Unorganized nature*: Lack of system, limited processing, no standard packaging.
- *Manufacturing challenges:* Largely manual operations, focus on margins at the cost of quality due to increased competition, lack of access to technology, high wastage no traceability.
- *Regulatory requirement and hygiene standards:* Due to lack of technical knowledge, the end product falls short of meeting the regulatory and hygiene requirements.
- *Low revenue and profitability:* Price realized from wholesalers as well as retailer is very low.

4.11.7.8. Product cost analysis

The overall margins in the sale of pickle and murabba are thin due to intense competition between processors. Raw material procurement is the biggest cost amounting for around 50-60% of total cost. Processors are depended on the wholesalers for the sale of product as retail sale is not enough to achieve the viable volume. These wholesalers/traders try to maximize their profit by paying as less as possible to the processors. From the

discussion, the current average price realized by the processor from the retail pack of Murabba is around Rs 70/- per Kg against the cost of production (including packaging) of Rs 62/kg thereby leaving a margin of Rs 8/- per Kg. The current average price of Murabba in institutional retail pack (18kg) is Rs 55/kg against its cost of production of Rs 50/kg. It is generally sold in reused tins.

1kg Murabba Wholesale

Sr. No	Particular	Amount(Rs/kg)
1	Average Cost of Production	62
2	Average Selling Price	70
3	Profit Margin	8
4	Profit Margin(%)	13%

Bulk 18kg Murabba Wholesale

Sr. No	Particular	As per Current Arrangements(Rs/kg)
1	Average Cost of Production	50
2	Average Selling Price	55
3	Profit Margin	5
4	Profit Margin(%)	10%

Similarly, the current average price for the Pickle is around Rs 30/kg in wholesale, whereas the cost of production including packaging is Rs 27/kg. Therefore, the processors is earning a profit margin of just Rs3/kg.

1kg Pickle Wholesale

Sr. No	Particulars	As per Current Arrangements(Rs/kg)
1	Average Cost of Production	27
2	Average Selling Price	30
3	Profit Margin	3
4	Profit Margin(%)	11%

4.11.7.9. SWOT Analysis

As mentioned earlier, pickle and murabba has been selected as ODOP for the Amritsar district. Following is the SWOT analysis for the pickle and murabba.

SWOT Analysis	
Strengths: • Presence of large number of pickle & murabba micro processing units in the district. • Large customer base and reputation for the quality.	**Weakness:** • Low profit margins for the processors involved in the processing of pickle and murabba. • Dependence on traditional method and lack of access to technology.
Opportunities: • Marketing of the products under common brand to gain wider access. • Potential for export of the product. • Tapping the large domestic market for sale in other states.	**Threats:** • Entry of large players in the pickle and murabba processing. • Ensuring the adherence to hygiene and regulatory requirements.

4.11.7.10. Identified gap

Various gaps were identified at the firm and cluster level, where work needs to be done in order to increase the scale of activities for ODOP. Following are the major firm level and district level gaps identified through stakeholder consultations.

S. No	Sectors	Gaps	Recommendations
1	Skill training needs	Lack of technical know-how for innovation of the product	Training and capacity building on various innovative product processing
2	Manufacturing practices	Difficulty in ensuring hygiene standards and meeting regulatory requirement	Training and capacity building on better manufacturing practices and hygiene & food safety aspect.
3	Technologies	Lack of access to modern technology in the form of advanced machinery and equipment	Upgradation of existing units through individual enterprise component of the PM FME scheme

Cluster/district level

Infrastructure	Up-gradation proposals

A) Public Infra	Amritsar district has good public infrastructure in terms of connectivity and urban infrastructure. Mishri bazar is the hub of pickle and murabba manufacturing and wider roads and public infrastructure in mishri bazar can help in increasing the accessibility of these units.
B) Common facilities	Common incubation center at Amritsar can be established to help the processors in accessing advanced machinery without making heavy capital heavy investment.
C) Testing facilities	Testing facilities are not available and establishment of testing lab can help in improving the standards through better access to testing.
D) Common Branding and Marketing	A common brand can be established under the branding component of the PM FME scheme to help the micro enterprises with better marketing access. It can help them in realizing better price for their products.

4.11.7.11. Way Forward: Areas of interventions & suggestions

The pickle and murabba processing industry in Amritsar has carved a niche for itself and renowned worldwide for its quality product. Processors involved in the processing of pickle and murabba have certain skill set in manufacturing which gives the distinct taste to these product. Various components of PM FME scheme can be leveraged to catapult the industry to higher level. From the detailed discussions with the units, we are proposing various intervention for the development of ODOP based industry in the Amritsar.

4.11.7.11.1. Support in branding and marketing

Branding and marketing of the pickle murabba was found to be a significant challenge resulting in limited outreach for the units. Some of the bigger units have their own brand, but most of the units sells their product without any brand. It was found that the processors involved in the pickle murabba manufacture products for some of renowned brand like Patanjali.

Branding and marketing support through creating a common brand for the pickle murabba of Amritsar can go a long way in ensuring the development of the industry. PM FME scheme has the component of branding and marketing for supporting the micro enterprises with branding and marketing. A common brand will help in increasing the sale through enhanced outreach of the pickle and murabba from Amritsar.

4.11.7.11.2. Establishment of incubation centre

Incubation centre is a type of common infrastructure which can be established under the scheme. As per the guidelines, the incubation centre should involve one or more product lines which could be utilized by the smaller units on a hire basis for processing of their produce.

These processors carry out largely manual operations as they are unable to make large capital investment. It is the biggest challenge which has impeded the growth for these small processors. Manual operation results in high cost of production and substandard quality of product. A common infrastructure near Amritsar city can help the units in scaling up the operations without making heavy capital investment in the purchase of machinery. Along with providing the opportunity to leverage advance machinery for processing, the proposed Incubation Center can also carry out the training and capacity building for the micro food enterprises and Self-Help Groups.

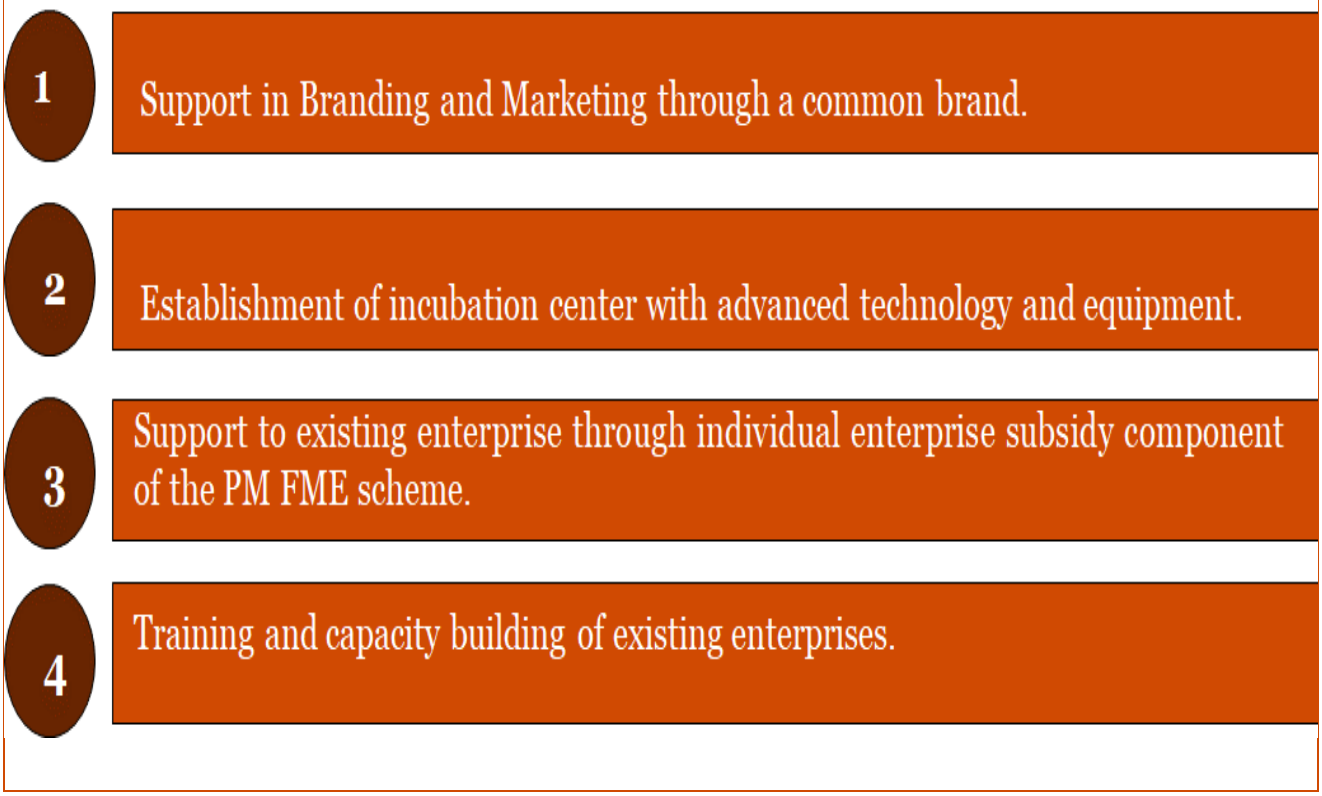
4.11.7.11.3. Support through the individual enterprise subsidy component

The PM FME scheme has the component of individual application, where the processors can be provided with the benefit of credit linked subsidy to help them in upgradation of their units. The units in the district should be encouraged to take the benefits under the individual component of the scheme through awareness creation. It can help the units in upgradation of their existing infrastructure.

4.11.7.11.4. Training and capacity building of the enterprises under the scheme

It was found that these processors lack the skills and technical know-how to scale up the activities. Training and capacity building component of the scheme can be leveraged for the training and capacity building of the enterprises. Training and capacity building can be undertaken on topics like food safety and hygiene, better manufacturing practices, branding and marketing etc. It can help the enterprises in expanding their knowledge base for scale up of activities.

Areas of Interventions



4.12. Jalandhar

4.12.1. Socio economic profile

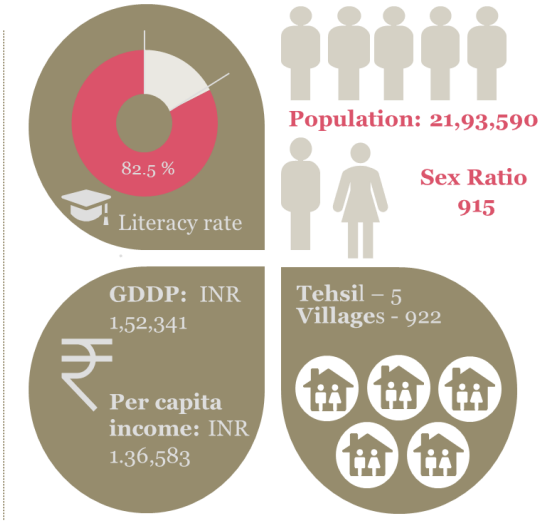
Jalandhar is a centrally located district, which falls in the Doaba region of the State. On the south, it is bounded by the Satluj river which separates it from Jalandhar and Firozpur district. On the north-west, Kapurthala district intervenes between the Jalandhar territory and Beas river, and on the north-east, it shares boundaries with Hoshiarpur district, broken by area of Phagwara tahsil of Kapurthala district, which juts into Jalandhar territory. The major towns of the district include Jalandhar, Bhogpur, Adampur, Nawanshahr, Banga, Aur, Nakodar, Shahkot, Phillaur, Nurmahal and Rurka Kalan. All these places are connected by rail and road.

The district is comprising of 5 tehsils, Jalandhar I, Jalandhar II, Nakodar, Phillaur and Shahkot. There are eight development blocks namely Jalandhar East, Jalandhar West, Bhogpur, Adampur, Nakodar, Shahkot, Phillaur, Nurmahal, Lohian and Rurka Kalan. The district has 956 inhabited villages.

The district Gross District Domestic Product (GDDP) and per capita income at current price, was above than the state average.

4.12.2. Demographic profile

According to 2011 census Jalandhar district has a population of 21,93,590 persons of which male and female population is 52.21% and 47.79% respectively. The district contributes nearly 8% of the state population. Out of the total population, 47.1% of the population resides in rural and 52.9% in urban areas. The rural population is spread over 922 inhabited villages.



The district has a sex ratio of 915 females for every 1000 males. The literacy rate of the district is 82.5%.

4.12.3. Climate and Rainfall

The climate of this district is on the whole dry except during the brief south-west monsoon season. January is generally the coldest month with the mean daily maximum temperature at about 19^{0}C and the mean daily minimum at about 6^{0}C during the winter season. June is generally the hottest month with the mean daily temperature at about 41^{0}C and the mean daily minimum at about 27^{0}C. sometime the day temperatures on individual days may reach above 45^{0}C. The average annual rainfall in the district was 703.0 mm.

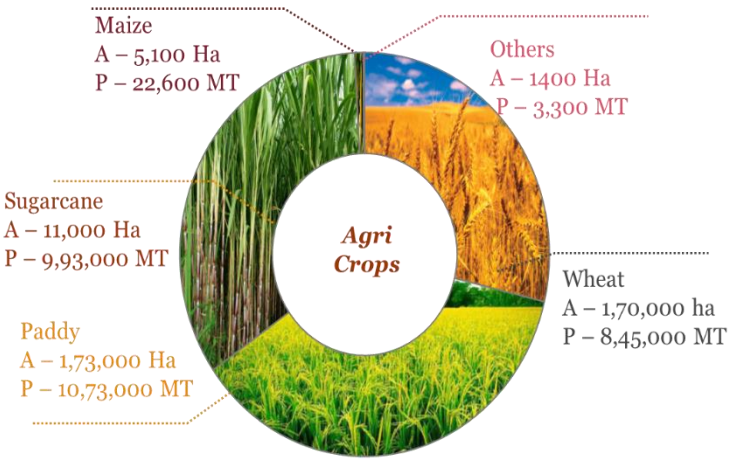
4.12.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is 91%. The district has the cropping intensity of 168%. The topography of the District is typical representative of an Alluvial plain and suitable for cultivating wheat and sugarcane. Wheat and paddy are the main Rabi and kharif crops of the district. The area under both crops has been increased by 2% from 2016-17 to 2018-19. The other major crops of the district include sugarcane and maize.

Production trend-Field crops

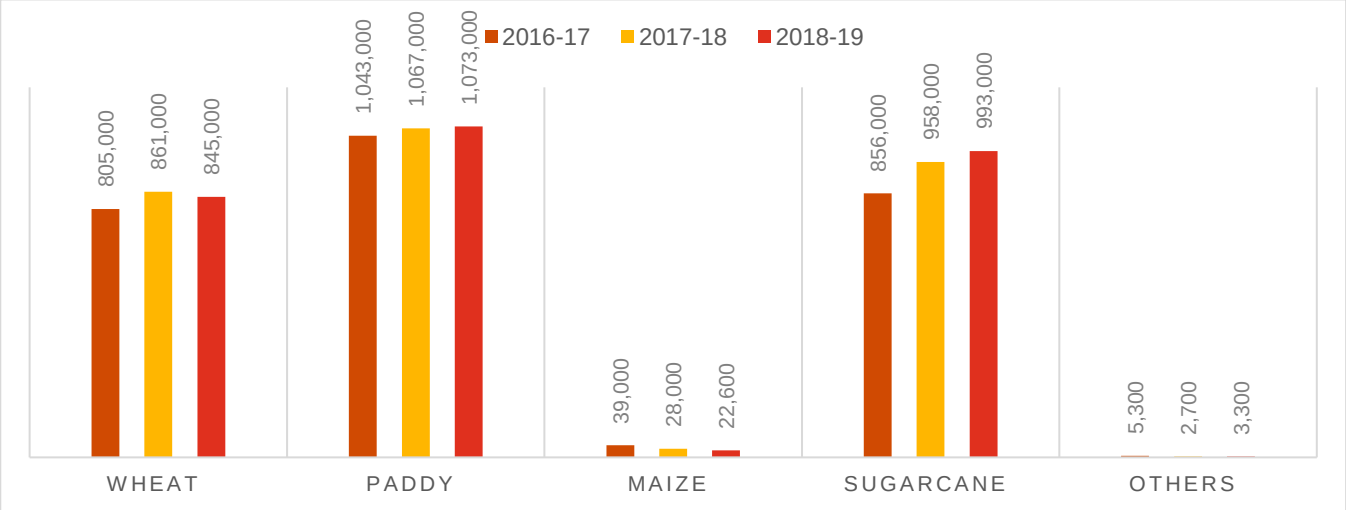
Production of Paddy and Sugarcane has shown increasing trend over years whereas production of Wheat has shown erratic trend in last three years.

Production of Maize crops has decreased over last three years.



Graph 92: Major Field crops grown in district Jalandhar (2018-19)

Source: Department of Agriculture, Govt. of Punjab



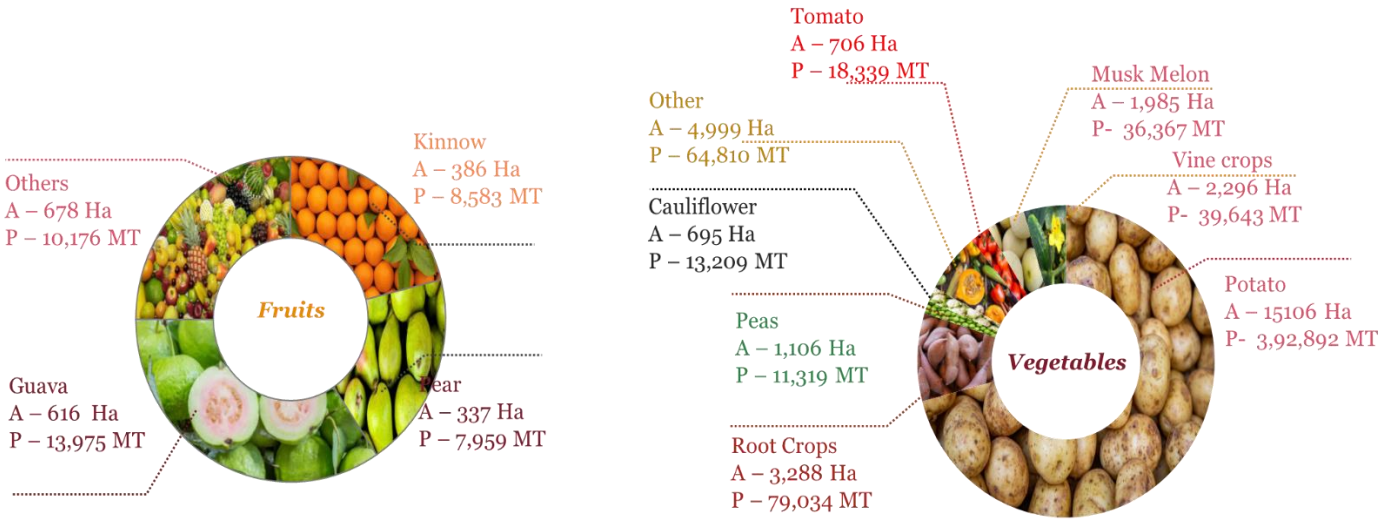
Graph 93: Production trend of field crops in Jalandhar district (MT)

4.12.5. Horticulture profile

Jalandhar district is an important district for the production of vegetables in the state. Overall, there is cumulative growth of 5% in the area under vegetables in last three years. The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc.

Out of all vegetables, maximum area is under Potato. The district tops in the production of Potato and musk melon amongst all districts of the state. The district is known for producing both seed and processing varieties of potato.

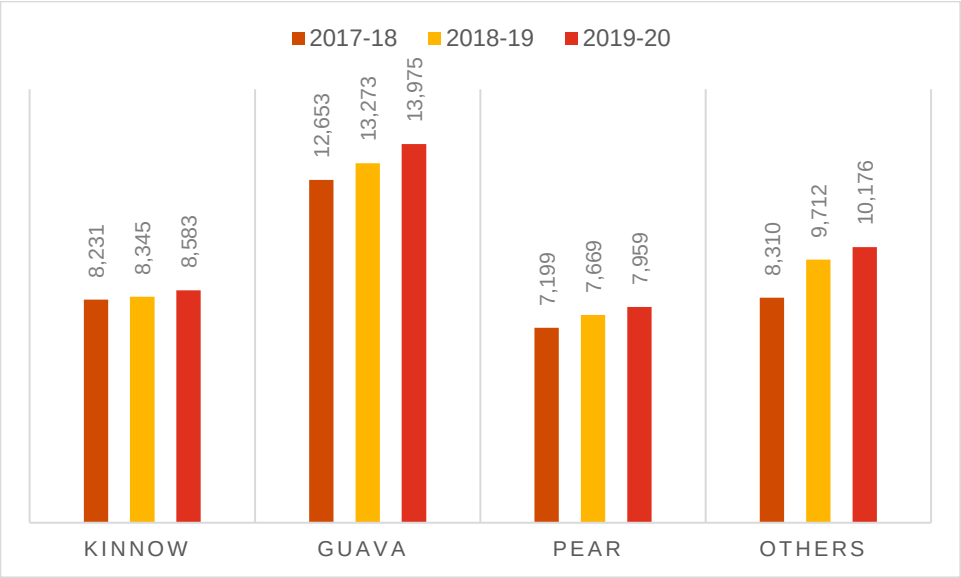
The district produces a wide variety of fruits like kinnow, lime lemon, mango, guava, pear, peach, plum, ber, etc., but in limited quantities. The district reported a cumulative growth of nearly 12% in area under all fruit crops taken together in last three years.



Graph 94: Major fruits and vegetables grown in the district Jalandhar (2018-19)

Production trend of fruits

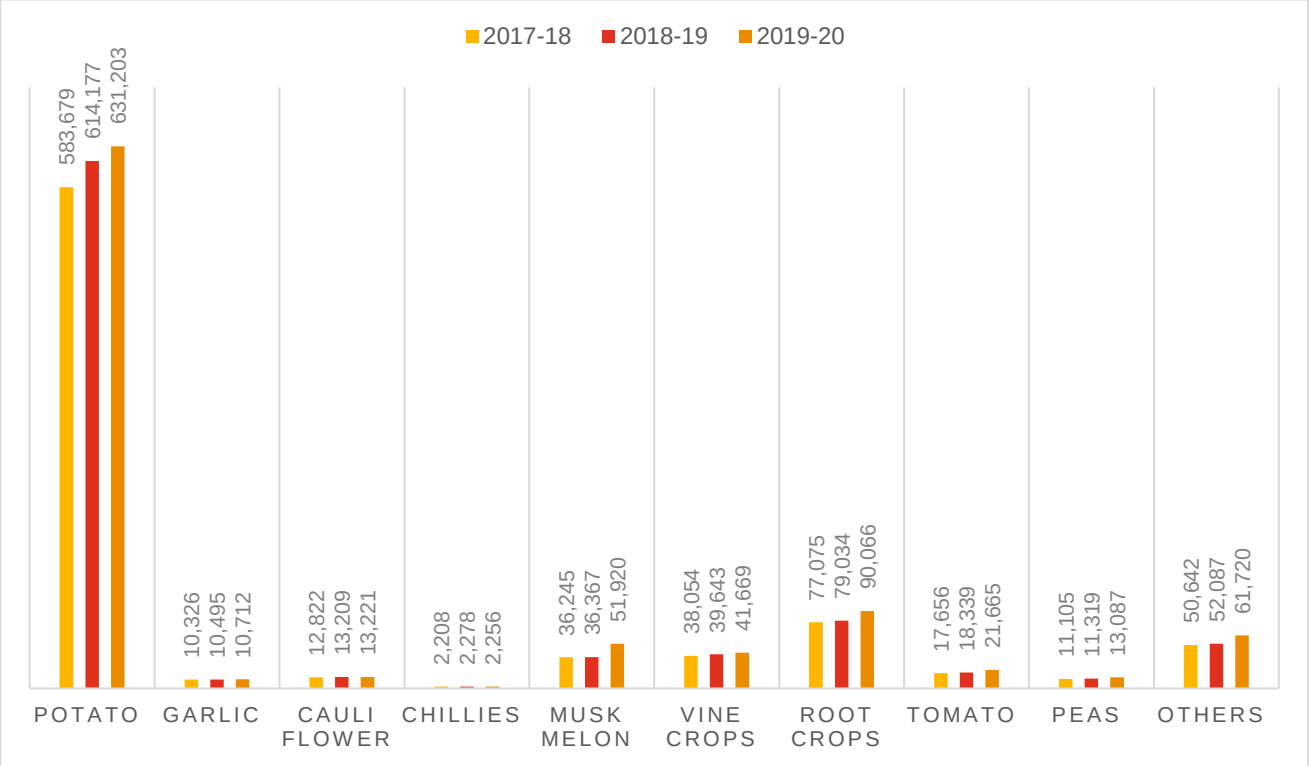
Production of kinnow, guava, peas and other fruit crops have shown significant increase in production. This shows, department of horticulture's initiative to promote horticultural crops has created positive impact.



Graph 95: Production trend of fruit crops in Jalandhar district (MT)

Production trend of vegetables

Production all the vegetable crops have increased over last three shows positive trend of diversification from conventional crops.

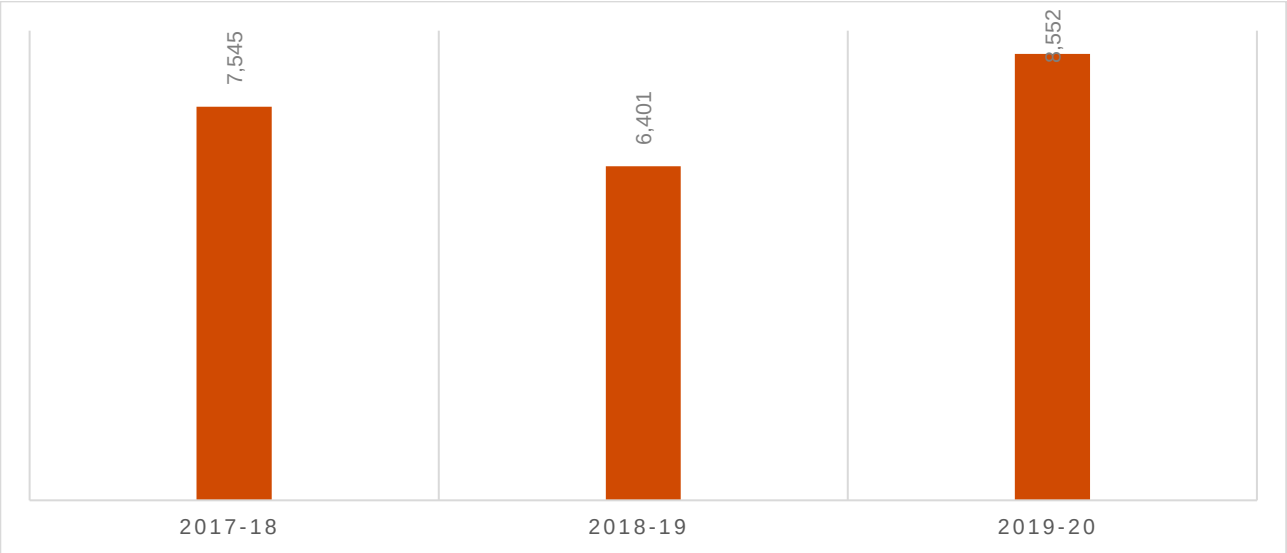


Graph 96:Production Trends of vegetable crops (MT) in Jalandhar

4.12.6. Allied activities

Production trend- Fish

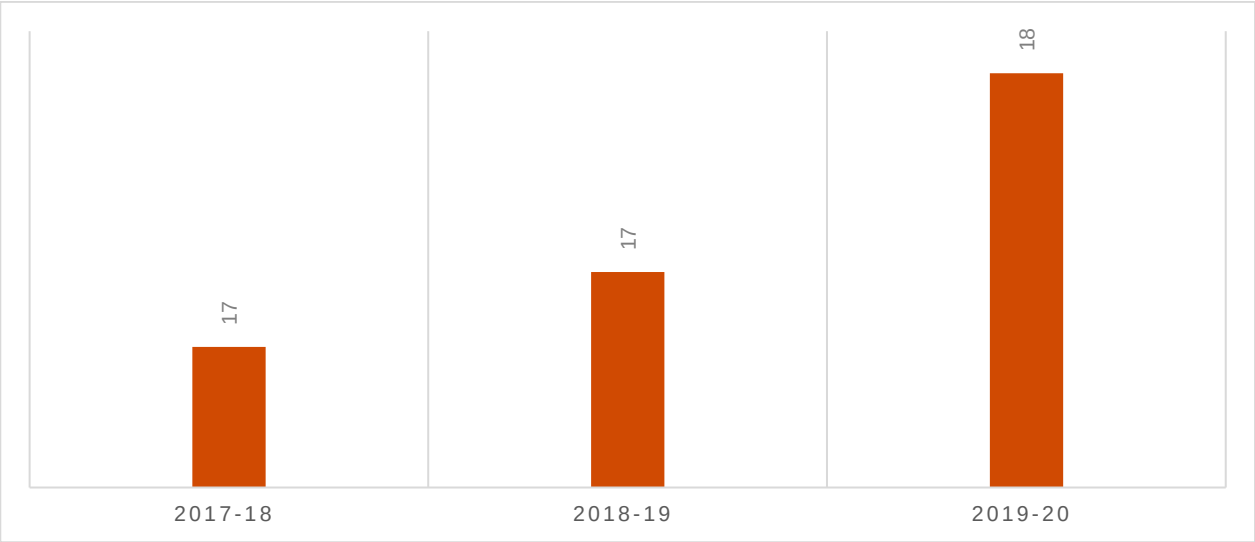
The production of fish was erratic in last three years. However, during 2019-10 the same improved to 8,552 MT. It was found that about 1,500 acres (both personal and panchayati land) is under fish farming in the district. There is good demand for IMC varieties of fish and the same is increasing year after year.



Graph 97: Production trend of fish in Jalandhar (MT)

Production trend- Milk

The district has reported consistent increase in the production of milk during past three years at 18.27 lakh liter/day.



Graph 98: Production trend of milk in Jalandhar district (LLPD)

4.12.7. Industrial profile

There are 20306 registered Micro Small enterprises in the district and 20 registered medium and large enterprises providing employment to 154986 and 6045 persons respectively, as per FY 2014-15.

Table 14: Industry in Jalandhar (2014-15)

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	20306
2	Registered Medium & Large Units	No.	20
3	Employment in MSE Sector	No.	154986
4	Employment in Large and Medium Industries	No.	6045
5	No. of Industrial Areas	No.	10
6	Turnover of MSE Sector	Rs. Lakh	380845.00
7	Turnover of Large & Medium Sector	Rs. Lakh	142563.01

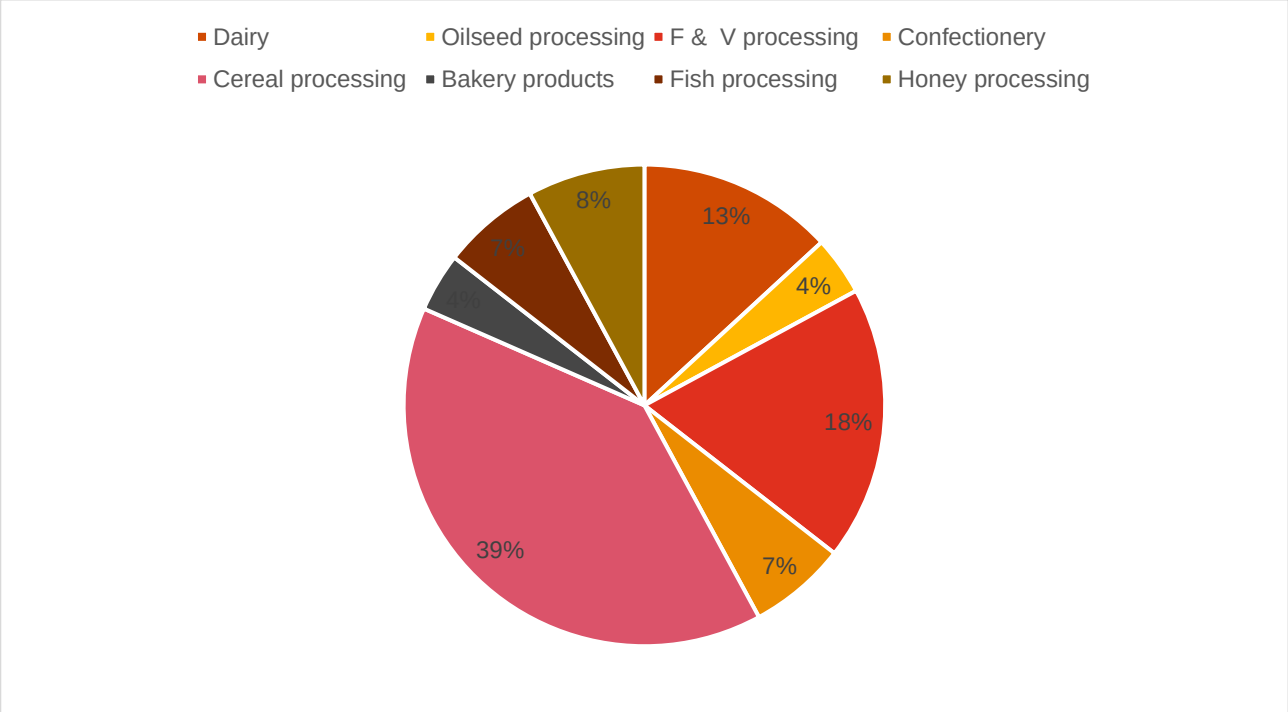
Source: Directorate of Industries, Jalandhar

Major food processing units in the district are as follow;

- The Doaba Cooperative Milk Producers Union Ltd., Jalandhar: The milk handling capacity of the plant in 1.5 LLPD. The Union has three chilling centers namely Sultanpur Lodhi in Kapurthala,, Shahkot in Jalandhar District and Khatkar Kalan in Nawanshahar district with capacity of milk handling 20000 LPD, 30000 LPD and 40000 LPD respectively.

As per the primary survey and stakeholder interaction, about 39% of the micro food enterprises are into cereal processing, 18% into F & V processing, 7% in confectionery manufacturing, 13% into dairy processing, 8% in honey processing, 7% into fish processing etc. There are over 1000 wheat flour mills, out of which 8 to 10 are medium sized roller mills and over 20 mini automatic flour mills. there are more than 65 Rice Shellers, 2 Sugar mills, 1 milk processing units, 3 small poultry processing units etc. There are 641 small scale agro processing

units including flour mills, dal units, vegetable processing units, solvent plants, gur making unit, mentha oil units, ketchup units and bread/biscuit making units in the district. In addition, Markfed has set up a new Cannery near Adampur and has started production of Sarson ka Saag, vegetable curries etc.
There are 5 to 6 medium sized fruits and vegetable processing units in the district, including two units by the State Co-operative i.e., Marked. There are 3 to 4 medium sized milk processing plants in the district.
The district also has over 400 bakery units. there are many individuals/micro enterprises, FPOs/SHGs etc. who are engaged in the manufacture of products like honey, pickles, murraba, sauces, sherbet, haldi, tomato sauces, etc



Graph 99: Spread of micro food enterprises in Jalandhar district

4.12.8. ODOP: Potato

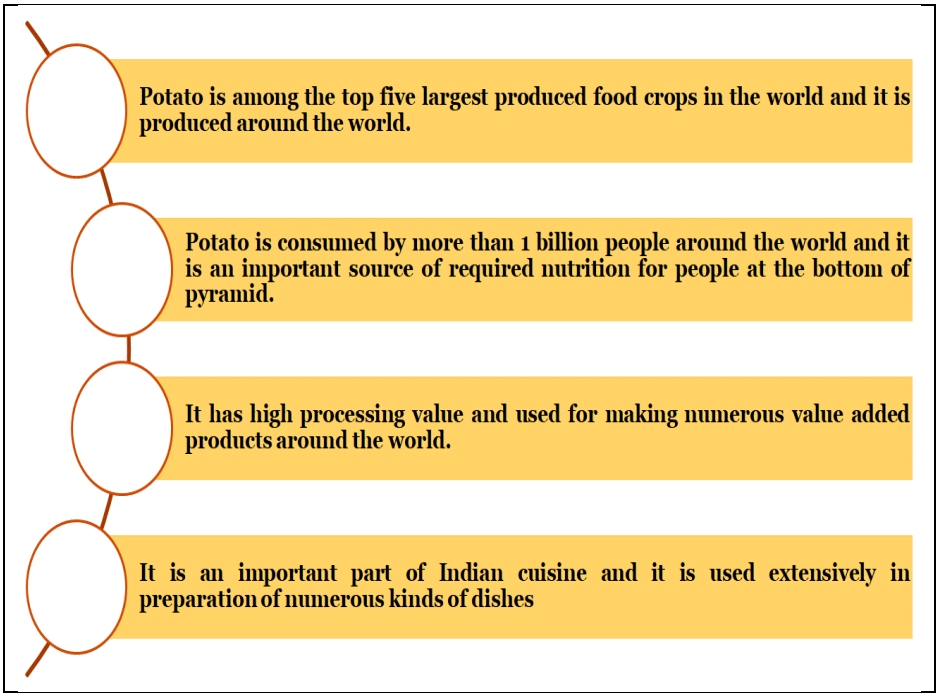
Potato has been selected as ODOP of the district.

Potato scientifically known as solanum tuberosum is an important food crop with around 370 million metric tons of production worldwide[38]. It is pertinent to note here that potatoes is considered fourth largest food crop after maize, wheat and rice. It is the most cultivated vegetable crop in the world. This crop has an important contribution in ensuring the food and nutritional security around the world. This tuber crop of the family Solanaceae has about 200 wild species. It originated in the high Andean hills of South America, from where it was first introduced into Europe towards the end of 16th century through Spanish conquerors. It was introduced to India by early 17th century probably through British missionaries or Portuguese traders. More than half of the potato production takes place in developing countries including India and over one billion people have potato as their staple diet. The increase in production is still higher in developing countries of Asia and Africa indicating its growing importance as a staple food source.

Potato: An Important Food Crop Around the World

[38] FAO: Statistics 2019

Indian vegetable basket is incomplete without Potato. In the state of Punjab, among vegetable crops, round 38% of the total area[39] is covered under potato which is raised for sale in fresh market as well as seed for the crop. Compared to other food crops, potatoes is short duration crop and has the potential of generating higher economic returns for the farmers. Seed variety of potato cultivation has grown rapidly in the state during recent times and today the state is one of the most important seed variety producing state for potatoes. Today, the state has become a supplier of large amount of disease-free seed potato to other states in India.



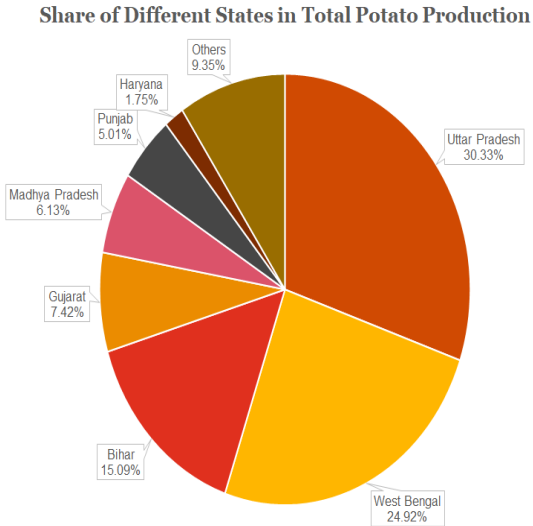
4.12.8.1. Clusters of Potato:

4.12.8.1.1. National Clusters

After China, India is the second largest producer of the potato in the world. Total area under potato cultivation in India is 2173000 Ha and total production of potato stands at 50.19 million tonnes[40]. Among vegetables, potato has the highest share of production contributing around 26% of the total vegetables production in the country. India has come a long way in potato production and today along with being self-sufficient in potato production India is also exporting seed potatoes to other countries. Indo- Gangetic planes are the major hub of potato production in the country and contributes around 90% of the total production in the country.

Uttar Pradesh, West Bengal, Bihar, Madhya Pradesh, Punjab and Gujarat are the major potato growing state in the country. Uttar Pradesh has the highest production of potatoes in the country and contribute around 30% of the total production of the country. West Bengal comes at second place with a total share of around 25% in total production. One significant development has been the rapid growth of potato processing industry in India during recent times. It has happened due to increasing urbanization and changing lifestyle of the people. Presently around 8% of the total production of potatoes are used for processing and it is expected to increase in coming future. Some

Potato Production: Contribution of Different States[41]

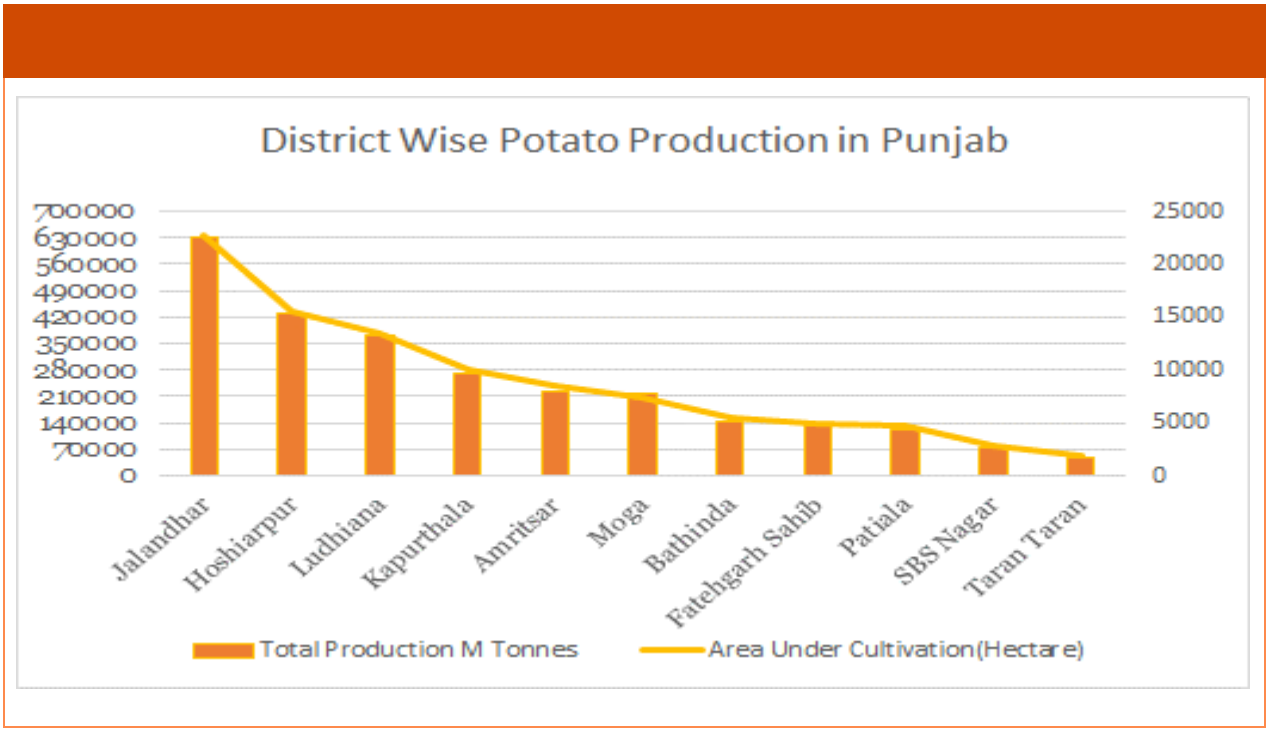


[39] Status Report: Department of Horticulture, Punjab
[40] *Area under Horticulture Crop Statistics 2018-19: National Horticulture Board*
[41] *Horticulture statistics at a glance, NHB*

varieties are more suitable for processing purpose and cultivation of processing variety has been showing an increasing trend in the country.

4.12.8.1.2. Clusters Within the State

The total potato production in the state stands at 28,69,953MT[42] and Punjab contributed around 5 % of the total potato production in the country. The total area under potato cultivation in Punjab is 106,066 hectares. The average productivity or yield for potatoes in Punjab is around 25MT/Ha which is still very low as compared to the yield in developed nation. Recently, Year 2020 proved to be a year of windfall gain for the potato growers of the state as prices of potatoes touched all time due to low production in other states. Deep sandy loam soils of Doaba region makes it one of the best region for potato cultivation. Major varieties grown here are Kufri Jyoti, Kufri Chipsona, Kufri Pukhraj, Badshah, Diamond, Chandramukhi and Sultana Jalandhar district in the Doaba region has the highest production of potatoes in the state followed by Hoshiarpur and Ludhiana. The total potato production in Jalandhar is 631203, which is around 22% of the total production of state. This is significant volume and it makes Jalandhar the hub of potato production in the state. Overall, the state has become an important hub for producing seed variety of potatoes. It has been estimated that around 52000 ha area is under cultivation for producing seed variety potatoes[43]. Apart from seed variety, processing variety potato cultivation is also increasing in the state.



Apart from Jalandhar, district Moga presents high potential in activities related to potato cultivation and processing due to continues increase in production since last three years. Moga district has maximum area under potato cultivation among all the vegetable crops. One more important aspect of potato cultivation is that the large quantity of potatoes produces in the district are used by manufacturer of French fries like Mc can, Balaji. One Centre of Excellence (CoE) has been established in Jalandhar for potatoes. The major objective of this CoE is to demonstrate new technologies for quality seed potato production and its supply to the farmers. This centre is undertaking front-line demonstrations and multiplication of potato varieties and also serving as training centre as

[42] *2019-20 Agriculture and Horticulture Statistics: Dept of Horticulture, Punjab*
[43] Status Report: Department of Horticulture, Punjab

well as source of quality planting material in form of seed potato. Disease free seed potato is being produced through tissue culture, aeroponics and improved production technologies. The centre constitutes of a Tissue Culture Laboratory, Plant Hardening facilities, Aeroponics, Shade-net house, Insect-net house units, Potato grading unit, small cold storage and Automated fertigation.

4.12.8.2. Processing activities in the state

Punjab has played an important role in the overall potato production ecosystem of country. As per one estimates, Punjab contributes around 12% of the total potato chips production in India. Similarly, the state contributes around 14% of the total French fries production. These are significant proportion considering the fact that the total production of the state is around 5% of the national production. It is pertinent to mention here that Frito lay established its processing plant in Sangrur district. Frito lay is the largest producer of potato chips in the world. Satnam agri industries in Jalandhar is significant player in the area of French fries production in the state. Little bee impex has its potato chips processing plant in Ludhiana district.

Other than the large and medium players, numerous small players are involved in the potato processing activities in the state. Jalandhar and Mohali are the important clusters for unorganized micro level potato processing. Major products processed by these unorganized processors are chips, flakes, alu bhujia etc.

4.12.8.3. Economic and social profile

Farmers involved in the cultivation are generally have higher plot size. Most of the farmers interacted with have basic education mostly till 10^{th} or 12^{th}. Some of the farmers belonging to younger generations have graduation degree. Prices of the crop are highly fluctuating resulting in greater amount of risk for farmers involved in the cultivation.

Similarly, unorganized processors belongs to middle or lower middle-class category with income levels ranging from 2.5 lakhs/annum to 5 lakhs/annum. Processing activities are carried out at household level at small scale. Many self-help groups are also involved in the processing of potatoes. Education level of these micro processors and SHG members is not very high. Majority of them have elementary education till 12^{th} with some of the comparatively larger processors having graduation degree.

4.12.8.4. Human resource and skill set

Unorganized potato processing happening at household and SHG level is majorly done through manual operation only. It is a labor-intensive activity, which provides employment to large number of people. During our interaction, we found that these processors do not have any formal training or skills sets related to processing. Some of the SHGs which we interacted with have gained some kind of training from local institutions like KVK.

It was realized that there is an utmost need for formal training to be provided to processors on aspects like packaging, marketing, food safety and hygiene. I can help them in scaling up of the activities as lack of formal skills have proved to be a significant challenge. We also observed that post-harvest losses are quite high in potato especially during the supply glut season. Training and capacity building of farmers on minimizing the post-harvest losses can result in significant economic gain for them.

4.12.8.5. Institutional support and support infrastructure

General infrastructure like road connectivity, power availability is good in the production clusters. All the villages have all-weatherd road connectivity along with power availability. It helps in better accessibility to market for farmers. There is well oiled APMCs structure available in the state, where larger commission agents are involved in the potato procurement from farmers. The good availability of general infrastructure also helps in processing enterprises through ensuring better movement of the processed products.

It is worth mentioning here that Jalandhar has one ICAR-CPRS (Central Potato Research Station), which was established in 1957. It is one of the oldest station and there are total seven such station across the country. It is located in village Badshahpur on Nakodar road. CPRS has contributed significantly in establishment of seed

potato industry in Punjab. CPRS is also involved in the research projects aimed at helping the processing industry in Punjab.

4.12.8.6. Quality Specifications and Packaging

As per the AGMARK specifications, potatoes are graded on the basis of various factors like size of tubers, conformity to the variety, tolerance limits for under sized and oversized tubers, percentage of diseased and damaged tubers, and 14 dust and extraneous matters, etc. Table potatoes are generally categorized into two categories, which are long or oval and round variety. There are two graded in each of these two varieties, which are extra special and special. In Oval variety, extra special grade should have minimum tuber diameter of 41mm and in special grade the minimum tuber diameter should be 29mm. In round variety, the minimum tuber diameter should be 45mm in extra special and 32mm in special grade.

Standard for export of potatoes:

Export quality potatoes has three grades which are extra special , special and general. In extra special grade, the minimum tuber diameter should be 46mm. For special grade and general grade, the minimum tuber diameters should be 35 mm and 25mm respectively. The crop should be reasonably clean and free from any kind of serious defects.

Storing and Packaging

Handling and packaging of the potatoes is generally done in the farm itself. After harvesting, the tubers are kept in a heaped condition temporarily and covered with straw. After a few days, sorting is done for separating the diseased and cut tubers. Potatoes are packed in jute bags for transporting to yard or brought as loose. For domestic market 40-50kg open mesh jute bags weighing 200-300 g is used. For export purpose, nettlon bags of 25kg capacity are used. Storing potatoes for longer period in normal temperature is not possible as it is a living material and through respiration, the changes occurs due to heat, resulting in loss of dry matter and ultimate deterioration of quality of tubers. Cold storage significantly improves the shelf like of potato along with maintaining the quality. Cold storage reduces the loss of dry matter which slow down the quality deterioration of tuber.

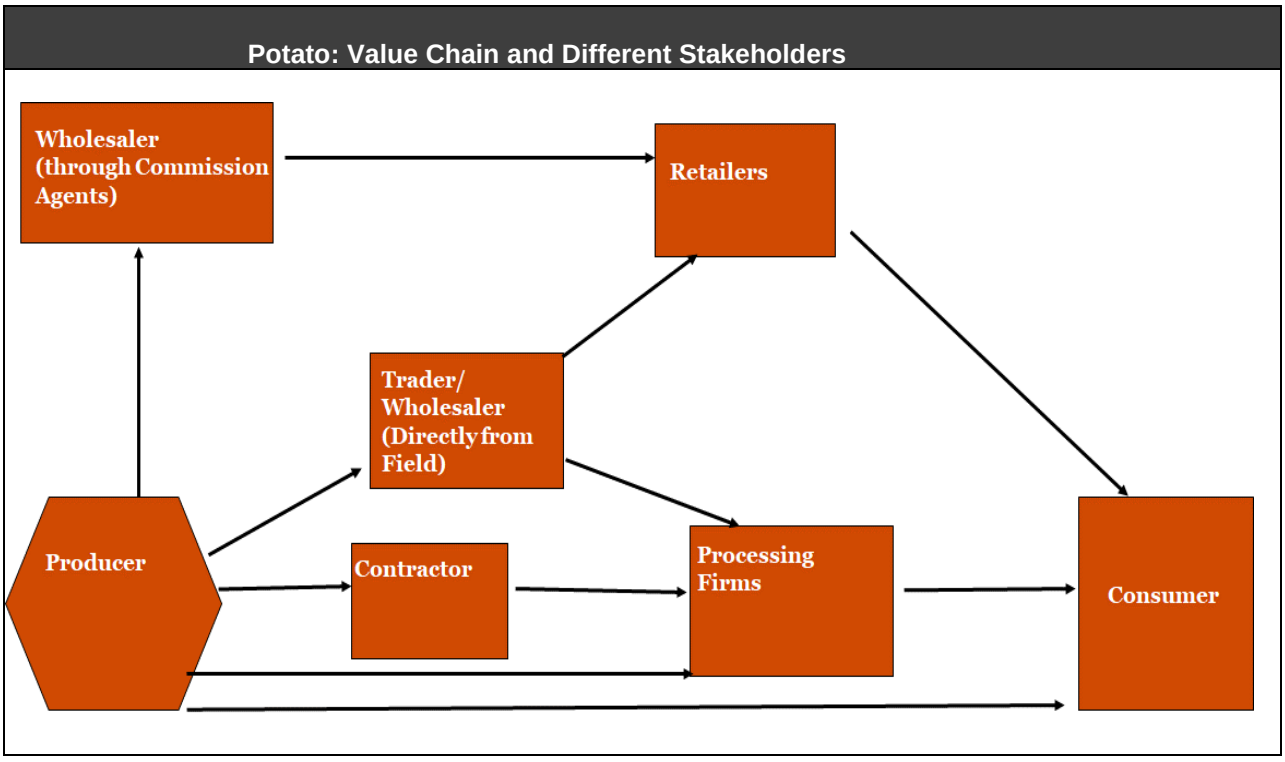
4.12.8.7. Potato Value Chain and Different Value Chain Actors

Unlike other vegetables, there are certain varieties in potatoes which are more suitable for processing activities. Other than processing activities, seed potatoes are also grown extensively in the state for the purposed of supplying as seed for potato cultivation. Therefore, marketing of potatoes is done differently for seed variety, processing variety and non-processing variety. Role of cold storage is also becoming prominent in the marketing channels for potatoes.

Processed varieties of potatoes are grown under contract or without contract in the state. In case of contract, farmers directly sell the produced potatoes to processing firm under contract. In case of non-contract, farmers sell the processed variety of potatoes to contractor operating in the area or can take the produce to nearby large market. Non processing variety and seed variety of potatoes are marketed through commission agents in mandi or sold to aggregators/wholesaler directly from the field. Broadly, following are the prevalent marketing channels for the potatoes in Punjab.

1. *Producer---Contractor/Processing firms*
2. *Producer---Wholesaler(Through Commission Agents in Mandi)---Retailers---Consumer*
3. *Producer---Trader/Wholesaler---Retailers---Consumer*
4. *Producer---Retailer ---Consumer*
5. *Producer---Cold Storage---Wholesaler---Retailers---Consumer*
6. *Producer---Cold Storage----Retailers---Consumer*
7. *Producer---Consumer*

Channel 1 is mainly used for processed variety of potatoes, where farmers sell the potato directly to firm under contract. In case of non-contract, aggregator buy the potatoes from the farmers and sell it to processing firm. In channel 2, mandi fees and charges for the commission agent has to be paid, which results in lower share for the farmers in consumer rupees. In recent times, channel 3 has become quite prevalent in the area in which trader/wholesaler directly procure the potatoes from the field itself. Prices are negotiated between farmers and traders. Channel 4 and 7 provides highest share of farmers in consumer rupees but marketing these two channel is very low due to limited capacity to dispose the high production volume through these two channels. Farmers also store the potatoes in cold storage to gain better price during off season or when supply is less. Generally, farmers pay the charges for storage to cold storage owner. The total cold storage capacity available in Punjab is estimated to be around 22.44LMT[44].



Marketing Costs

Marketing costs are the actual expenses incurred in bringing goods and services from the producer to the consumers. The marketing costs normally include;

[44] Status Report: Department of Horticulture, Punjab

- Commission and market fees
- Handling Charges at local points
- Transport and storage charges
- Handling charges by wholesaler and retailer

In Punjab, market fee for fruits, vegetables and grains are same but commission charges in vegetables are greater than grains. Tentative market fees, commission charges and taxes on Potato in Punjab are described below in the table:

S. No	Particulars	Charges (%)
1	Market Fee	2%
2	Commission Charge	5-6%
3	Rural Development Fund	2%
4	Miscellaneous Charges (Handling, weighing, loading, unloading, cleaning etc.)	3-4%

Price discovery by intermediaries

The price determining mechanism is briefed below:

- **Farm gate price:** Practice of direct purchase of potatoes by traders/wholesalers from the field of the farmers is becoming quite popular in recent times. Traders directly goes to the field and negotiate the price with the farmers. He picks the potatoes from the field and bear all the handling and transportation cost.
- **Auction through commission agents:** potato is auctioned at the market yard and auctioning process is facilitated by the commission agents. The price is generally determined by the demand and supply situation.
- **Wholesalers and retailers:** They generally work on markup basis and final consumers negotiate the price. Wholesaler do the markup through by adding his required margin.

Marketing Margin

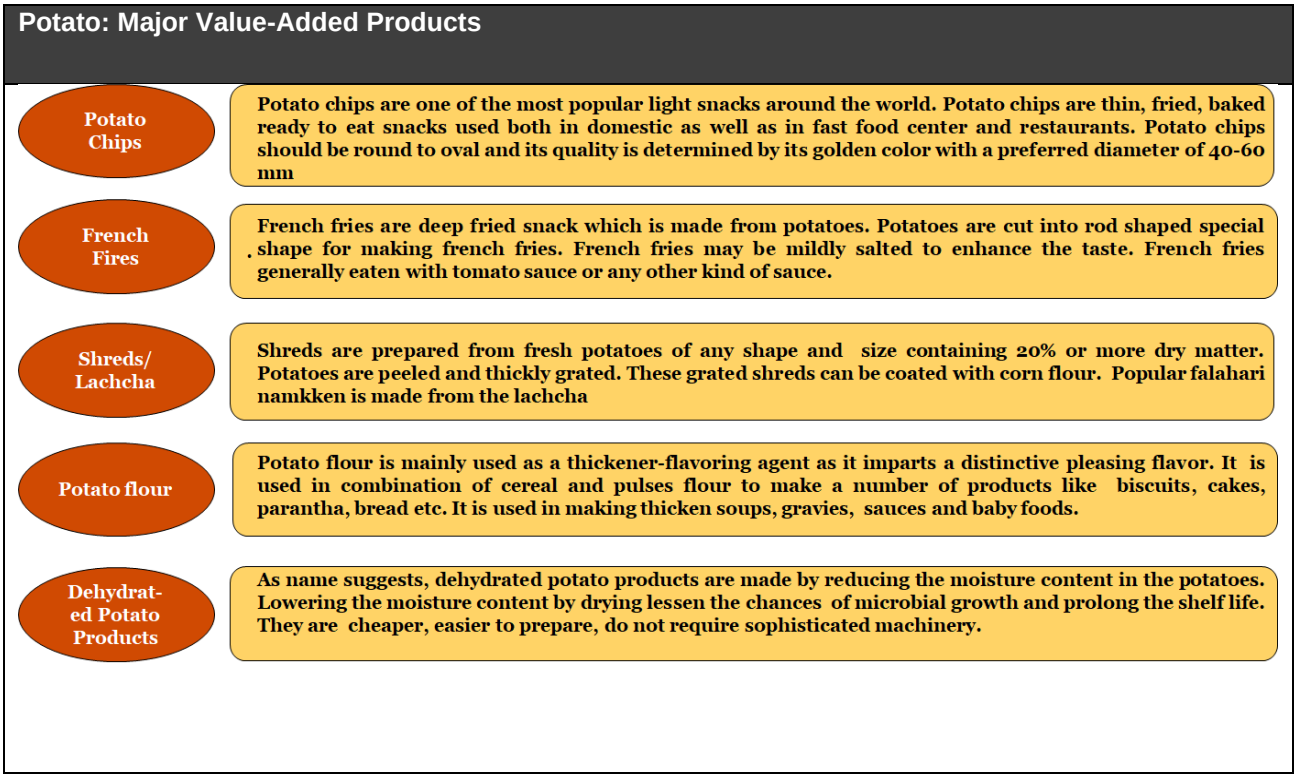
Total marketing margin is cost involved in moving the Potato from producer to consumer and profit of various market functionaries. Absolute value of the total marketing margin varies from market to market, channel to channel and time to time. The prices of Potato and farmer's share in consumer's rupee varies inversely with the length of the marketing channel. Price build up (based on the assumption) in Potato is described in table below:

S. No.	Particulars	% Share to consumer Rupee
1	Net price received by producer	40-45%
2	Marketing cost paid by producer	10-12%
Farmers sale price		**50-55%**
3	Handling charges, commission, market fee, losses etc.	10-12%
Wholesaler's Purchase Price		**60-65%**

4	Wholesaler's Margin @12%	12%
Wholesale price in the market		**75-80%**
5	Retailers Charges on handling, losses@ 10%	7-8%
Retailer's Purchase Price		**85-88%**
6	Retailers Margin @12%	12%
Consumers purchase price or Retailer's sale price		**100%**

4.12.8.8. Value Added Products of Potatoes

Potatoes are used for manufacturing numerous value-added products apart from being consumed as a vegetables. Potatoes proceeding industries are highly developed in America and European countries. Around 50-60% of the total production is consumed in the form of processed value-added products. In India, the potato processing industry is still at nascent stage and only around 7-8% of total production is used for processing.



4.12.8.9. Major issues faced by the processors and producers

Farmers and micro processors faces multitude of challenges resulting in impeded growth for them. Lack of access to capital is one of the significant challenge along with product innovation and marketing. Following is the detail about the major challenges.

Lack of access to capital for expansion: Most of the micro processors involved in the potato processing have limited capacity to scale up due to high capital requirement. Credit from formal banking institutions is not readily available for these processors due to unorganized nature of their business. Therefore, these enterprises majorly rely on manual operation to carry out the activities.

Highly fluctuating raw material cost: The prices of potato varies a lot from season to season depending upon the supply situation. Increased raw material cost in terms of potato procurement results in higher production cost for the processors. It results in lower profit margins for the processors contributing to low remunerative business.

Lack of training and formal skills: These micro enterprises does not have any kind of formal training and skills in processing activities. Although, KVKs at some places have helped the SHG members with formal training on various processing, but still aspects like food safety and hygiene maintenance remains big challenge for these unorganized players.

Branding and marketing: The scale of the activities undertaken by these micro processors is not very high due to limited sales. These processors sells the product at local level only without any kind of branding and marketing. Some of the products produced by these micro enterprise have exceptional quality but not reach to significant number of customer due to lack of branding and marketing. Developing some kind of common brand can these micro enterprises with increased visibility resulting in increased sales volume.

4.12.8.10. Identified Gaps

Various gaps were identified at the firms and cluster level, where work needs to be done in order to increase the scale of activities for ODOP in cluster districts. Following are the major firm level and district level gaps identified through stakeholder consultations.

S. No	Sectors	Gaps	Recommendations
1.	Access to credit	Lack of access to credit through formal sources due to the unorganized nature of the business	Supporting the individual micro enterprises under the individual credit linked subsidy component of the scheme.
2	Skill training needs	Lack of technical know-how on safety and hygiene maintenance	Training and capacity building with special focus on meeting the food safety requirement and maintaining hygiene during production process
3	Post-harvest losses and price fluctuation	High post-harvest losses due to mishandling of the crops. Prices fluctuates a lot from season to season	Creation of cold storage common infrastructure for storage and minimizing the losses.
4	Branding and marketing	Inability to market the product resulting in lower visibility.	Creating a common brand under the PM FME scheme for marketing of potato related processed products.

4.12.8.11. SWOT Analysis

As mentioned earlier, Potato has been selected as ODOP for Jalandhar and Moga district. Following is the SWOT analysis for the potato in these districts.

SWOT Analysis	
Strengths: • High volume of production in the districts. • Production of varieties suitable for processing activities. • Recent increase in area under potato cultivation.	**Weakness:** • High fluctuation in prices due to demand supply mismatch. • Lack of efficient market channels for the marketing of potato.
Opportunities: • Potential to contribute in crop diversification.	**Threats:** • Stagnant yield or productivity since last few years.

• Short duration crop with potential for high return in case of price rise. • Untapped processing opportunities for value added products.	• Lack of technical know-how to undertake processing activities.

4.12.8.12. Way Forward: Areas of interventions & suggestions

The potato crop has relatively more processing opportunities due to consumption of wide range of products proceeded from potato. Punjab is one of the major potato producing state and has the advantage presence of large processing units like frito lays. Small unorganized processors can be supported under the various components of the PM FME scheme to help them in scale up their activities and catapult overall potato industry to higher level. From the detailed discussions with the various stakeholders, we are proposing various intervention for the development of ODOP based industry in the cluster areas.

4.12.8.12.1. Credit linked subsidy support to individual enterprise

Micro enterprises finds it difficult to access formal credit due to unorganized nature of the business. These enterprises can be supported under the PM FME scheme through credit linked subsidy components of the scheme. DRPs can create the awareness at the level of micro enterprise level about the scheme. These unorganized processors should be encouraged to fill the application form by providing support through DRP.

Credit linked subsidy through the scheme can help the micro enterprises in scaling up of their activities through upgradation of existing infrastructure. It will help in resolving the pressing problem of credit access for expansion activities.

4.12.8.12.2. Establishment of common infrastructure in the form of cold storage

Although the state of Punjab has relatively higher cold storage capacity when compared with the other state, still there exist scope for establishment of common cold structure due to high post-harvest losses. Along with reducing the post-harvest losses, common cold storage infrastructure will also help in fetching better prices for the growers through selling the produce during high demand.

Common cold storage infrastructure will also help the processors through ensuring increased raw material availability during off season. It should be stablished through careful selection of geography where no such facility is available nearby. Some FPCs are operational in the production cluster. These FPCs can be encouraged to avail the benefits under PM FME scheme for the establishment of common cold storage infrastructure.

4.12.8.12.3. Support in branding and marketing

Branding and marketing of the potato product produced by micro enterprises is a significant challenge resulting in limited outreach for the units. They don't have much visibility, which result in lower sale volume through retail sale. Although the product is of good quality and without any adulteration, but still sale is not high due to lack of marketing. These small processors themselves are not able to take up the marketing due to technical know-how and financial constraints.

Branding and marketing support through creating a common brand for the jaggery produced from these units can go a long way in ensuring the development of these units. PM FME scheme has the component of branding and marketing for supporting the micro enterprises with branding and marketing. A common brand will help in increasing the sale through enhanced outreach of the micro enterprises involved in potato processing. .

4.12.8.12.4. Training and capacity building of the micro enterprises involved in potato processing

It was fond that micro enterprises involved in the processing of potato-based products does not have any formal training and skills. They especially face difficulties in aspects like food safety, hygiene and packaging. These processors can be provided with training and capacity building support under the PM FME scheme.

4.12.8.13. Suggested interventions

Particulars	Gaps/ Problems	Suggested Interventions	Intervention Agencies	Actions under PMFME
Processing units	• Limited potato processing units available in the district • Lack of access to credit • Supply side constraints due to fluctuation in production • Smaller players facing competition from large players like pepsico	• Encouraging the individual micro enterprises • Training and capacity building of farmers and enterprises • Exploring the opportunities for demonstration of modern technology	• Individual entrepreneurs • Farmer • SHGs • Farmer Producer Companies • Existing Food Processing Units • KVKs	• Assistance under the individual and group component part of the PMFME scheme
Capacity Building	• Low technical know how of farmers on better package of practices. • Lack of post-harvest infrastructure	• Development of customized training curriculum • Organizing beneficiary training	• State Level Technical Institution, PAU Ludhiana • NIFTEM • DRPs	• Training and capacity building of beneficiaries under PMFME Scheme
Marketing & Branding	• Low technical know-how on brand development and management • Lack of opportunities for forward market linkages	• Development of marketing and branding plan/ reports • Organizing buyer-seller meet • Development of packhouses with modern packaging facilities	• SPMU • Farmers/Investors/ SRLM	• Exploring the opportunities for marketing the products under a common brand
Common Incubation Facility	• Requirement of heavy capital investment for establishing of processing infrastructure.	• Creating a common infrastructure for processing of potato and other vegetables for micro enterprises and individuals	• SLTI • SNA • Private players • KVK	• Setting up of common incubation facility at Jalandhar

4.12.1. Non ODOP

Apart from Potato, Jalandhar has a good productivity of the milk. The production of milk from 2017-18, 2018-19 and 2019-20 is 1712000 litres, 1770000 litres and 1780000 litres respectively. The production of poultry meat approx 23550 MT, while the egg production is around 2059 lakh egg. Though, Jalandhar have a good production of meat and egg even there is no industry for processing the same.

Apart from Potato, Milk, Poultry/Egg can be next potential ODOP.

4.13. Ludhiana

4.13.1. Socio economic profile

Ludhiana is the most centrally located district, which falls in the Malwa region of the State of Punjab. It is bounded on the north by the river Satluj, which separates it from Jalandhar and Nawanshahr districts. The river also forms its northern boundary with Hoshiarpur district. On other sides it shares common boundaries with Rupnagar district in the east and Moga district in the west, and Sangrur and Fategarh Sahib districts in the south and south-east, respectively. Ludhiana district is in the central plain zone of Punjab. It is blessed with fertile alluvial land and its ever growing industry

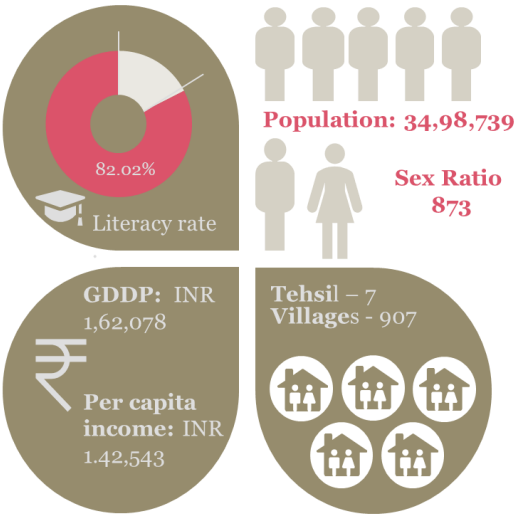
Ludhiana city was founded in the times of Lodi dynasty which ruled at Delhi from 1451-1526 AD. The legend goes that two Lodi chiefs Yusaf Khan and Nihang Khan were deputed by Sikandar Lodi (1489-1517 AD) to restore order in this region. Yusaf Khan went across the river Satluj in Jalandhar Doab to check Khokhars, while Nihang Khan stayed back and founded the present city. The new town was originally known as Lodiana, which means the town of Lodis

Ludhiana city is the district headquarter and the district is divided into seven tehsils namely; Ludhiana East, Ludhiana West, Jagraon, Samrala, Khanna, Payal, Raikot. The district comprises of 11 blocks namely Ludhiana – 1, Ludhiana – 2, Jagraon, Samrala, Khanna, Dehlon, Doraha, Maloudh, Pakhowal, Machhiwara, Sidhwan bet, Sudhar and Raikot.

Ludhiana district has recorded the highest Gross District Domestic Product (GDDP) during 2015-16. The (GDDP) and per capita income of the district is much above than the state average.

4.13.2. Demographic profile

As of 2011 it is the most populous district of Punjab and contribute 12.6% of the state population.



According to the 2011 census Ludhiana district has a population of 34,98,739 of which male and female population were 53.38% and 46.62% respectively. The district has a population density of 978 inhabitants per Sq Km. Its population growth rate over the decade 2001-11 was 15.4%. Ludhiana has a sex ratio of 873 females per 1000 males and a literacy rate of 82.02%.

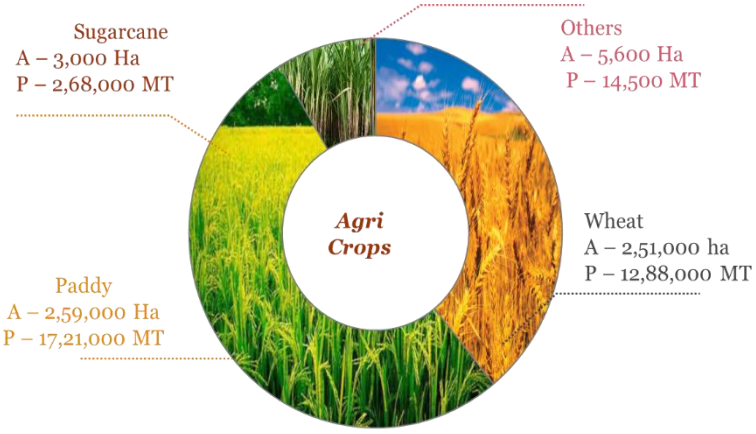
4.13.3. Climate and Rainfall

The climate of Ludhiana district can be classified as tropical steppe, hot and semi-arid which is mainly dry with very hot summer and cold winter except during monsoon season when moist air of oceanic origin penetrates into the district. The normal annual rainfall of the district is 680 mm. The south west monsoon , contributed about 78% of annual rainfall. July and August are the wettest months.

4.13.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is 81%. The district has the cropping intensity of 199%. The district has number of designated fruits & vegetable, fish/meat and grain markets run by state agency. Wheat and paddy are the main Rabi and kharif crops of the district. In the year 2018-19, wheat and paddy recorded production figures of 1.28 MMT and 1.72 MMT, respectively.

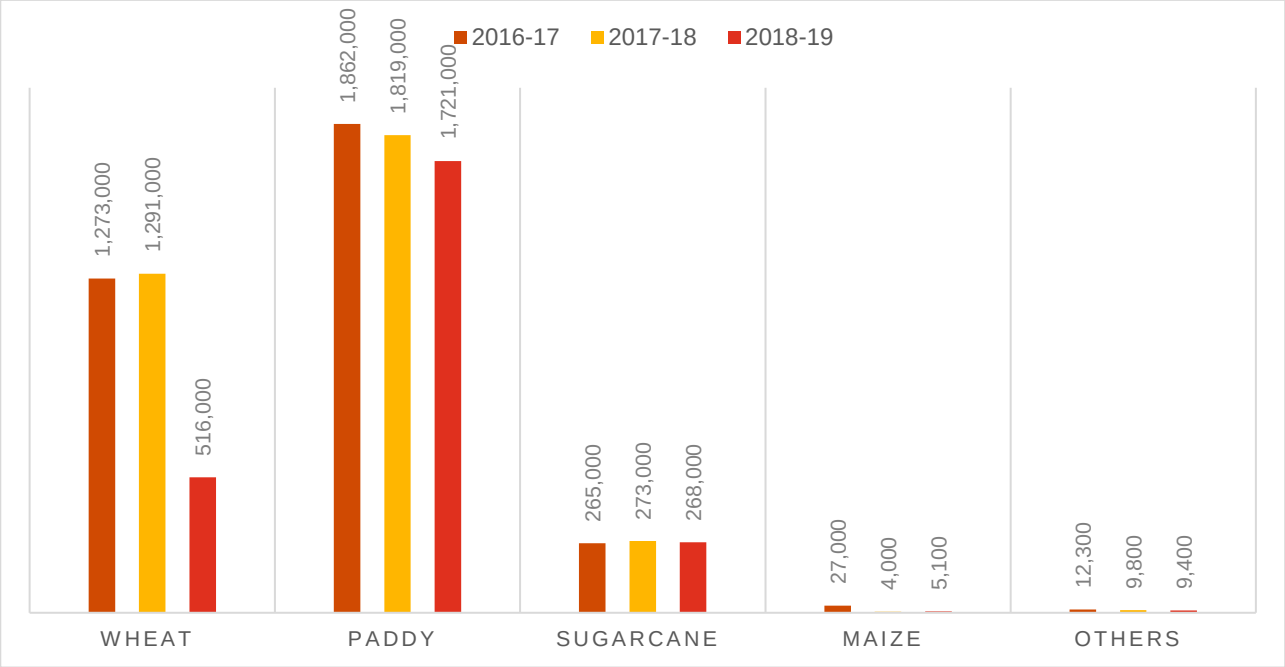
The district is second highest producer of paddy and third highest producer of wheat. The other major crops of the district include sugarcane, maize, pulses, barley, and oilseed. Area under production for sugarcane has been 3000 Ha in the year 2018-19.



Graph 100: Major Field crops grown in district Ludhiana (2018-19)

Source: Department of Agriculture, Govt. of Punjab

However, when it comes to production trend over the years, almost all field crops have shown a declining trend. The graph depicted below emphasizes the same. Amongst all field crops, wheat has shown a remarkable percentage decline in production of around 59.47 from 2016-17 to 2018-19.



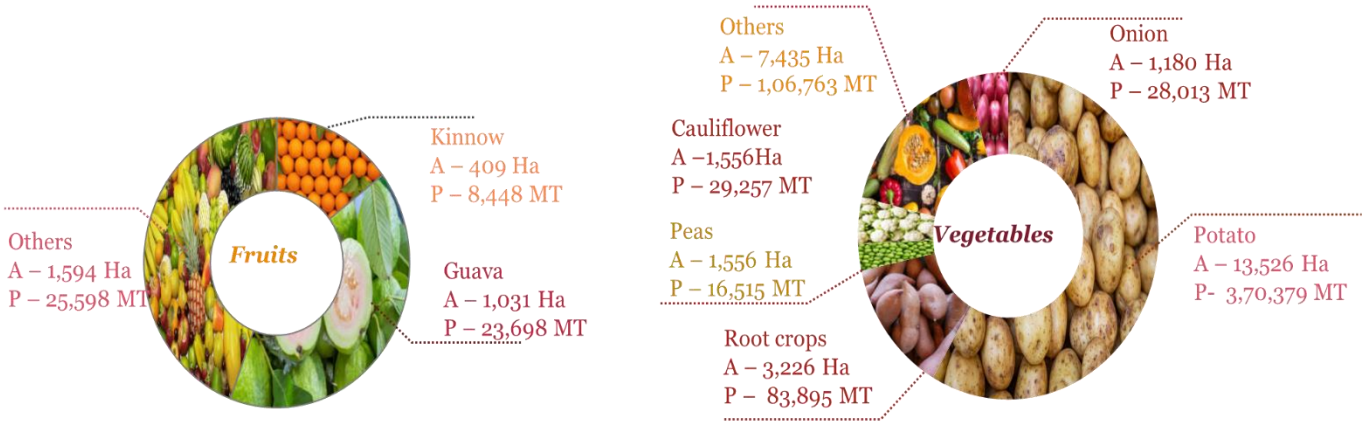
Graph 101: Production trend of field crops in Ludhiana district (MT)

4.13.5. Horticulture profile

Ludhiana district is an important district for the production of vegetables in the state. Overall there is cumulative growth of 11% in the area under vegetables in last three years (from 2016-17 to 2018-19). The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc.

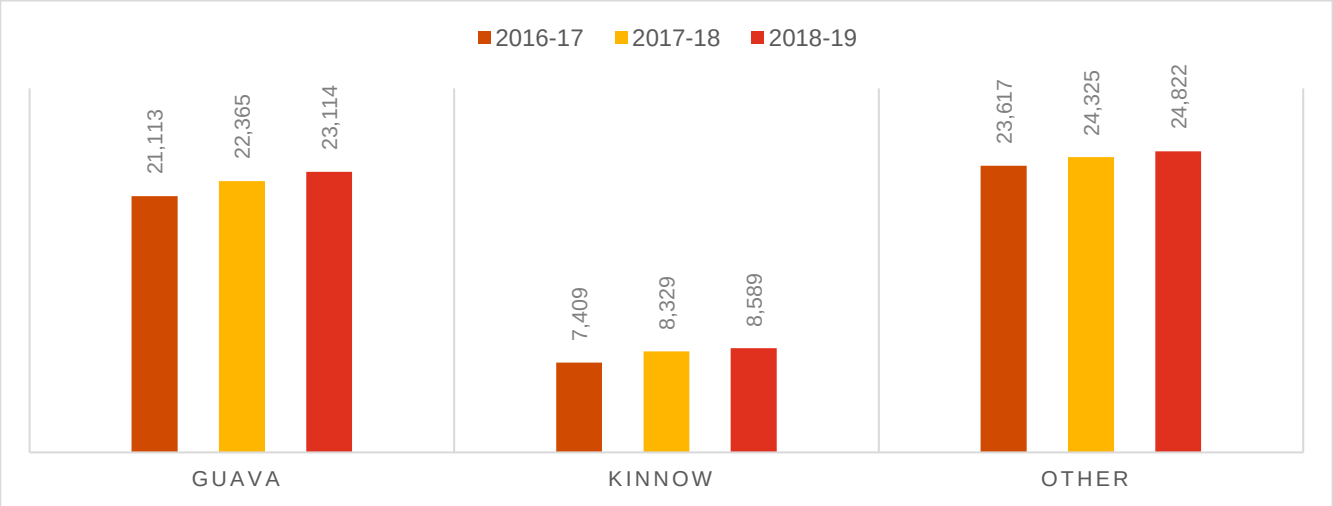
Out of all vegetables, maximum area is under Potato. The district tops in the production of Okra amongst all districts of the state, a cumulative growth of 16% over the last 4 years from 2016-17 to 2019-20.

The district produces a wide variety of fruits like kinnow, lime lemon, mango, guava, pear, peach, plum, ber, etc., The district reported a cumulative growth of nearly 17% in area under all fruit crops taken together in last four years from 2016-17 to 2019-20.



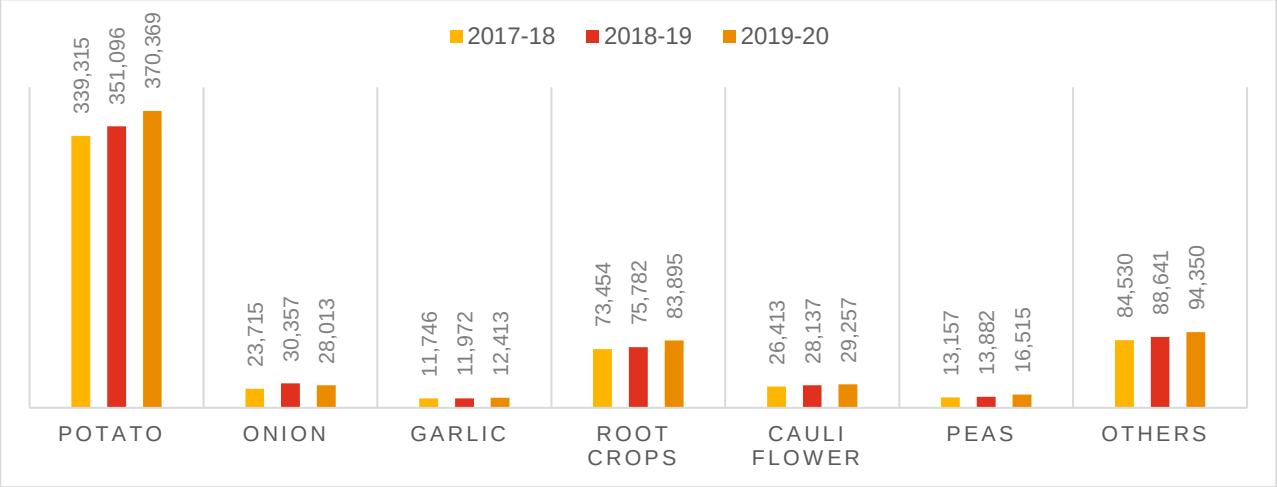
Graph 102: Major fruits and vegetables grown in the district Ludhiana (2019-20)

Production of fruits in Ludhiana district have shown an increasing trend over the years from 2016 to 2018-19. Same is depicted with the help of a graphical representation below.



Graph 103: Production trend of fruit crops in Ludhiana district (MT)

Similarly, in the case of vegetables, production has increased over the years for all kinds of vegetables, except in the case of Onions; which have shown a 7.72 % decline in production from the year 2018-19 to 2019-20.

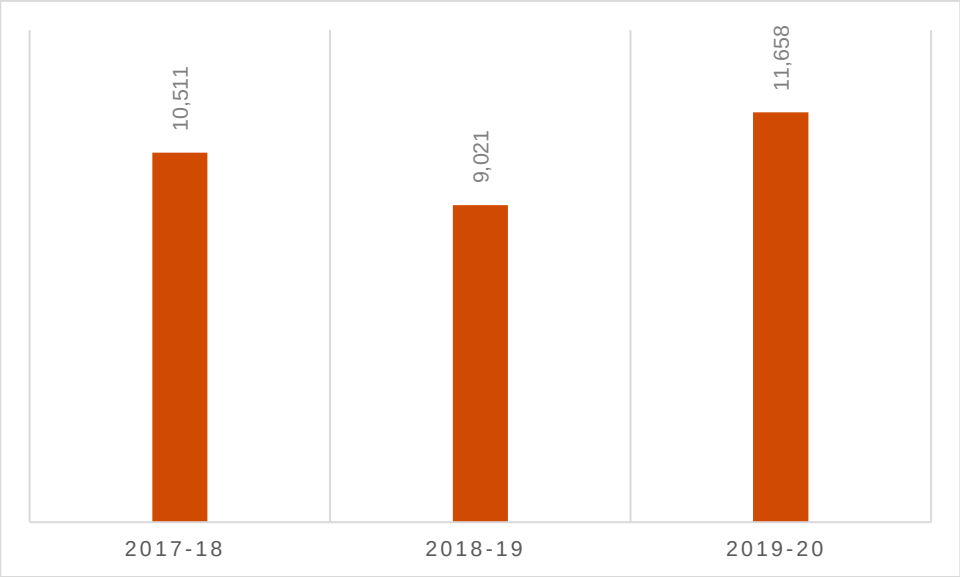


Graph 104: Production trend of vegetable crops in Ludhiana district

4.13.6. Allied activities

Production trend- Fish

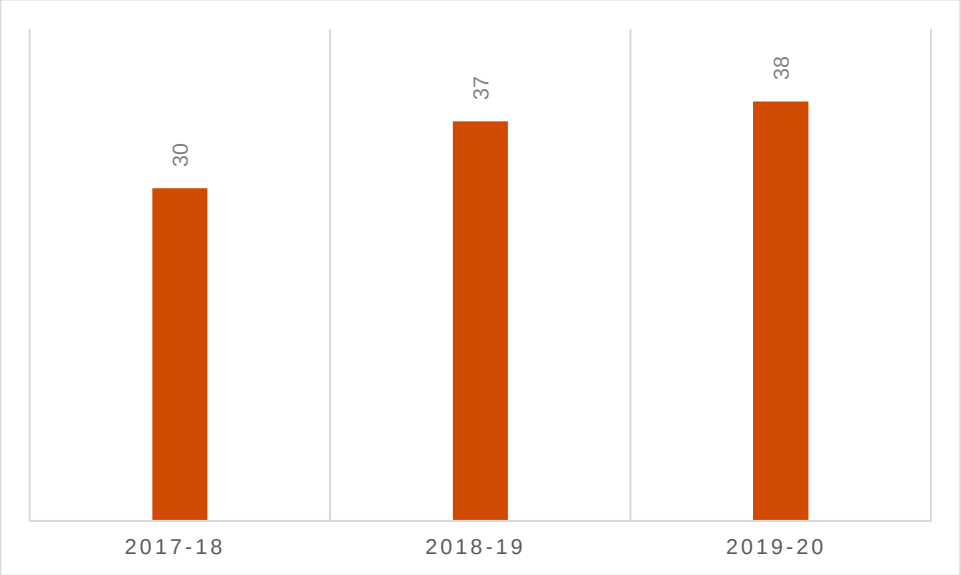
The production of fish was erratic in last three years. However, during 2019-10 the same improved to 8,335 MT. It was found that over 1,500 acres is under fish farming in the district. There is good demand for IMC varieties of fish and the same is increasing year after year. There are people who maintain frozen stores for storage of fish etc. There is a dedicated fish market run by the state agency i.e., Punjab Mandi Board. Fish offers a promising future for farmers and processors



Graph 105: Production trend of Fish in Ludhiana district (MT)

Production trend – Milk

Milk production in the district has increased from 30 LLPD to 38 LLPD in last three years. There are several milk processing units in the district.



Graph 106: Production trend of milk in Ludhiana district (LLPD)

4.13.7. Industrial profile

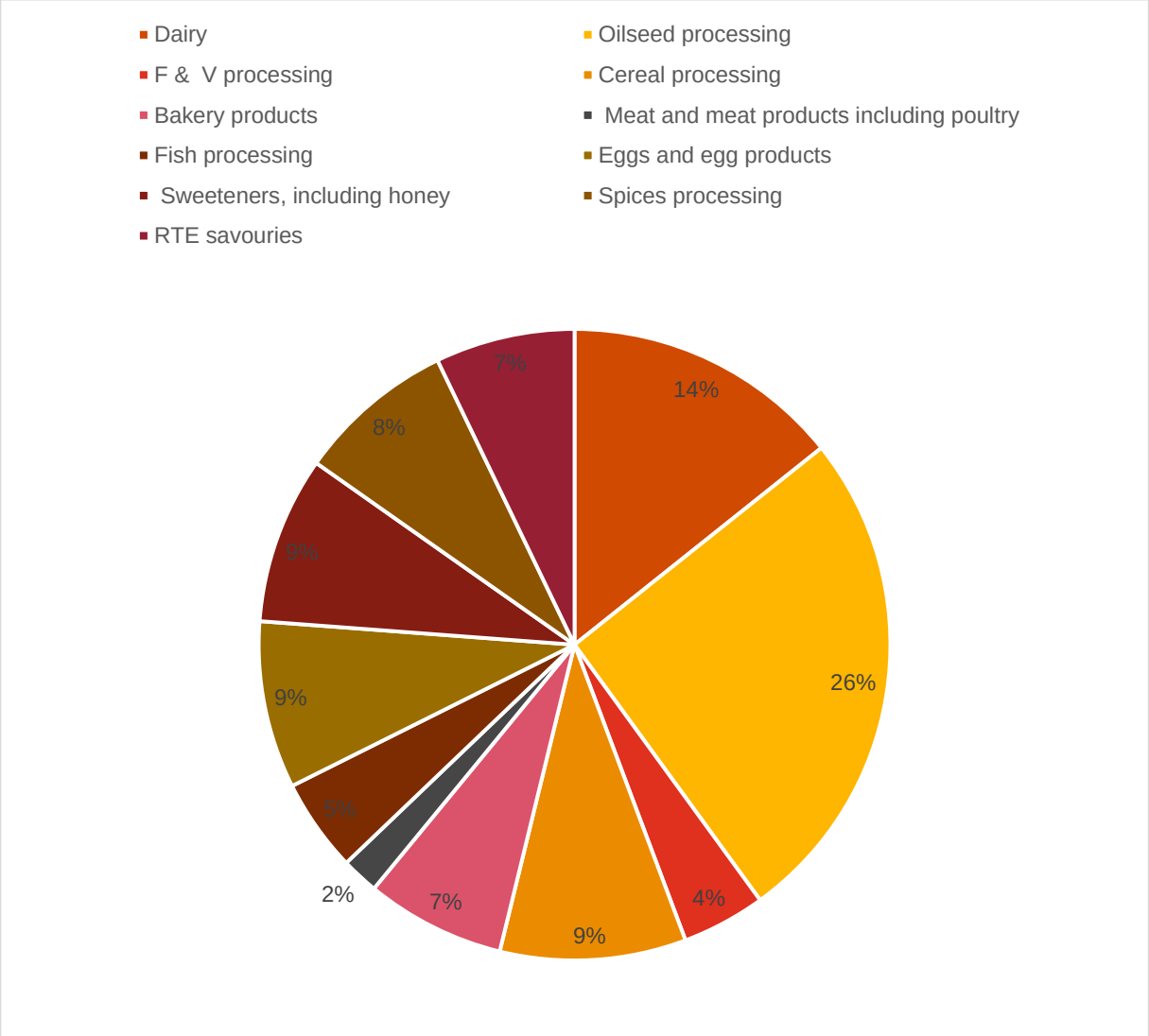
There are 38552 registered Micro Small enterprises in the district and 153 registered medium and large enterprises providing employment to 4,35,820 and 94,434 persons respectively, as per FY 2014-15.

Table 15: Industry in Ludhiana (2014-15)

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	38552
2	Registered Medium & Large Units	No.	153
3	Employment in MSE Sector	No.	435820
4	Employment in Large and Medium Industries	No.	94434
5	No. of Industrial Areas	No.	
6	Turnover of MSE Sector	Rs. Lakh	56599840.39
7	Turnover of Large & Medium Sector	Rs. Lakh	3224193.44

Major food processing units in the district are as follows;

- The Ludhiana Dist. Coop. Milk Producers Union Ltd., Ludhiana: The Milk Plant Ludhiana handles 4 LLPD of milk facilitates the manufacturing of Ghee, Table Butter, SMP, WMP, Paneer, Milk Cake, Dahi, Plain Lassi and Kheer etc.
- Bee Hive Farms Pvt. Ltd., Ludhiana: Bee hive is involved in manufacturing, trading and supplying Honey & it's based products



About 26% of the micro food processing units in the district is into processing of oilseeds, 13% into dairy processing, 9% into cereal processing, 9% into honey processing, 4% into F&V processing, 7% into bakery, 8% into spices processing, 7% into RTE manufacturing.

There are two medium/large sized vegetable processing units (Godrej Tyson Foods and Iscon Balaji Foods) in the district. A Spanish company CNN in collaboration with IFFCO is setting up a large sized vegetable processing plant in Machhiwara. Then, there large number of ready-to-eat/ready-to-cook food processing units from small and micro enterprises. There are many FPOs/SHGs who are manufacturing and packing pickle, chutney, sherbet, spices, lassi, honey etc.

There are over eight medium sized milk processing plants manufacturing a wide range of milk products like pasteurized milk, curd, paneer, lassi, desi ghee, butter, khoa, cream etc. There are 3 to 4 medium sized units (Bonn, Kitty, etc) and a number of small and micro enterprises manufacturing breads, biscuits, cakes, dry cakes, buns, etc

4.13.8. ODOP

Bakery Products has been selected as ODOP of the district.

Ludhiana is known as the industrial capital of Punjab. Under the food processing sector, bakery and soya processing are quite common in Ludhiana. There are a number of popular brands of bakery products like Bonn, Kitty, Cremica and Supreme. There are around 200 bakeries and soya industries under MSME sector. These

industries are located in different locality like Sarabha Nagar, Hussainpura, Kohara, Bhai Himmat Singh Nagar. Most of the micro and small bakeries has mainly captive retail outlet, which bake in the back yard and sell at the front outlet. There are also established bakery units having production unit at one place from where all the products are made and distributed to different retail shops. Ludhiana bread industry enjoys the distinction of supplying bread to the entire north region comprising Punjab, Haryana, Himachal Pradesh, Chandigarh, parts of Rajasthan, Uttaranchal and Uttar Pradesh.

The bakery units in Ludhiana cluster are very popular for their tasty, quality and variety of baked food items like rusk, paav, pizza, bread, bun, biscuits, cream roll, matthi, namkeen, toasts, puffs and cakes. These products can be grouped primarily into three types of products such as (1) Breads and buns, (2) Cookies and biscuits and (3) Macaroons. These products have further categories based on their ingredients like there are cakes, which are made up of chocolate, strawberry, pineapple, etc. Products like cakes are custom made to meet the demands of customers. The production levels of bakeries quite varying based on demands. The production and installed capacity of the similar industries in the cluster vary from one unit to another; even production of a unit is also not constant during the year. The production data is generally available only in terms of number of pieces produced for a particular product.

Different ingredients used for preparation of bakery products include maida, sugar, ghee/ vegetable oils. The finite share of each ingredient depends on type of bakery product and bakery involved in making those. These ingredients are sourced from local retails market by small bakeries but medium units make bulk procurement from wholesalers.

The weight of products depends on their type e.g. bun ” 240 mg, papdi ” 275 gm and cream roll ” 750 gm. Of these, cream roll fetches better revenues. A vast majority of these bakery products caters to local market. The base ingredients across all bakery products include maida, wheat powder, ghee and vegetable oil, which may be around 70% except for papdi/matthi (100%).

The total turnover of bakery and soya processing industries in Ludhiana cluster is estimated to be about Rs 125 crore with annual aggregate production about 2500 MT (excluding 7 large bakeries). The bakery industries provide direct or indirect employment to more than 6000 people.[45]

Major Player in the district are as follows;

Kitty Industries Pvt. Ltd.- It is one of the largest manufacturers of bread and bakery products. They are into business since 1977 with registered office at Ludhiana. The unit is manufacturing all types of Breads like White, Brown, Whole Wheat & Fruit in various sizes. The unit is also manufacturing all type of Bakery items like Pav Buns, Pizza Base, Fruit Buns, Burger Buns, Rusks & Toast, Eggless Biscuits, Eggless Cakes, Bar Cakes & Muffins, Breadcrumbs & coatings, & Traditional sweets in different Sizes & Packaging. The marketing network is spread in the states of Punjab, Chandigarh, Haryana, Himachal Pradesh, Uttaranchal, Western U.P., Rajasthan and Jammu & Kashmir. The products are distributed in these states through a chain of approx. 1750 distributors.

The company has adequate infrastructure including its own fleet of 200 vehicles, company's own workshop to have smooth operations to ensure timely, fresh supply of bread and other products[46].

Bonn Nutrients Pvt. Ltd.- is one of the largest bread makers in North India. They are into business since 1985 in Ludhiana. It holds 67 per cent market share in the region, producing nearly 600,000 loaves daily. Apart from a range of breads, Bonn Nutrients makes an assortment of buns, cakes, cookies, rusk, and biscuits in its bakeries at Ludhiana and Kapurthala in Punjab, as well as at its franchise and contract manufacturing units in several

[45] Cluster profile-Ludhiana Bakeries
[46] Kitty Bread official website

other states in the north. From just Rs 65 crore in 2004/05, its turnover has shot up to Rs 400 crore today. It also exports some of their exclusive products to USA[47].

Mrs. Bector's Cremica- The company is into operations since 1985 in Ludhiana. Operating from fully equipped factories with a total capacity (Owned + Contractual) over 1, 02,600 metric tonnes per annum. Cremica specializes in producing an array of biscuits and cookies. Market across the globe and offer the best & premium products in 64 countries.

Minor Player:

There are more than 100 micro food enterprises in the cluster have a turnover of less than Rs 2.5 lakh per month involved in bakery. A few units are of medium in size (20 numbers) with a turnover of over Rs 25 lakh per month.

These bakery units in Ludhiana are very popular for their tasty, quality and variety of baked food items like rusk, paav, pizza, bread, bun, biscuits, cream roll, matthi, namkeen, toasts, puffs and cakes. Products like cakes are custom made to meet the demands of customers.

Eg- Sharman Jain Sweets Pvt. Ltd., Sita Ram & Sons, Lyallpur Foods, Om Prakash Confectioners and Bakers Pvt. Ltd.

The bakery & cereals market consists of retail sales of baking ingredients, baking mixes, bread & rolls, breakfast cereals, cakes, pastries & sweet pies, cereal bars, cookies (sweet biscuits), dough products, energy bars, morning goods and savory biscuits.

Large population, rapid urbanization, and growth of the middle class population are the primary factors driving the growth of the bakery & cereals market. Additionally, stable economic conditions of our country supported the demand for bakery & cereals. Moreover, millennials are adopting western culture which tends to increase consumption of bakery & cereals food products in the region.

The global bakery & cereals market had total revenues of $560.8bn in 2019, representing a compound annual growth rate (CAGR) of 4.2% between 2015 and 2019. In comparison, the Asia-Pacific and US markets grew with CAGRs of 6.1% and 2.4% respectively, over the same period, to reach respective values of $132.1bn and $119.0bn in 2019. Market consumption volume increased with a CAGR of 1.9% between 2015 and 2019, to reach a total of 1,60,476.1 million kilograms in 2019. Bread & rolls accounted for the highest value in the global bakery & cereals market in 2019, with total sales of $191.5bn, equivalent to 34.2% of the market's overall value. In comparison, sales of cakes, pastries & sweet pies reached a value of $142.2bn, equating to 25.4% of the total market value.

The Asia-Pacific bakery & cereals market had total revenues of $132.1bn in 2019, representing a compound annual growth rate (CAGR) of 6.1% between 2015 and 2019. In comparison, the Chinese and Japanese markets grew with CAGRs of 8.1% and 2.1% respectively, over the same period, to reach respective values of $67.6bn and $25.3bn in 2019. Market consumption volume increased with a CAGR of 4.7% between 2015 and 2019, to reach a total of 28,209.8 million kilograms in 2019. In 2024, the Asia-Pacific bakery & cereals market is forecast to have a volume of 31,758.4 million kilograms, an increase of 12.6% since 2019. The compound annual growth rate of the market in the period 2019–24 is predicted to be 2.4%.

Cakes, pastries & sweet pies accounted for the highest value in the Asia-Pacific bakery & cereals market in 2019, with total sales of $60.0bn, equivalent to 45.5% of the market's overall value. In comparison, sales of cookies (sweet biscuits) reached a value of $20.3bn, equating to 15.4% of the total market value. China accounts for 51.2% of the Asia-Pacific bakery & cereals market value. Japan accounts for a further 19.2% and India accounts for 5.9% of the Asia-Pacific market.[48]

United States based multinational Mondelez International, Inc. is the leading player in the Asia-Pacific bakery & cereals market, accounting for 2.5% of the market's value in 2019. The company accounted for value shares of 11.5% and 6.5% in cookies (sweet biscuits) and savory biscuits segments, respectively in 2019.

[47] Bonn official website
[48] Bakery & Cereals in Asia Pacific, August 2020, Marketline

Japan based multinational Yamazaki Baking Co., Ltd. is the second leading player in the Asia-Pacific bakery & cereals market, accounting for 2.4% of the market's value in 2019. The company accounted for value shares of 3.8% and 3.5% in cakes, pastries & sweet pies and bread & rolls segments, respectively in 2019.

India based multinational Britannia is the third largest player in the Asia-Pacific bakery & cereals market, accounting for 1.4% of the market's value in 2019. The company accounted for value share of 7.4% and 1.0% in cookies (sweet biscuits) and savory biscuits segments respectively in 2019. Whereas Parle Products Pvt Ltd. accounts for 1.2% of the market's value in 2019.

Artisanal Producers accounting for 35.9% of sales in the Asia-Pacific bakery & cereals market in 2019; private label brands accounted for a further 6.9% of the market's value.

4.13.8.1. Clusters of Bakery

4.13.8.1.1. National Clusters

The Indian bakery & cereals market had total revenues of $7,838.8m in 2019, representing a compound annual growth rate (CAGR) of 10.9% between 2015 and 2019. In comparison, the South Korean and Chinese markets grew with CAGRs of 2.2% and 8.1% respectively, over the same period, to reach respective values of $4,024.1m and $67.6bn in 2019. Market consumption volume increased with a CAGR of 7.4% between 2015 and 2019, to reach a total of 6,026.1 million kilograms in 2019. Cookies (sweet biscuits) accounted for the highest value in the Indian bakery & cereals market in 2019, with total sales of $3,989.5m, equivalent to 50.9% of the market's overall value. In comparison, sales of bread & rolls reached a value of $1,620.7m equating to 20.7% of the total market value.

Cookies (sweet biscuits) is the largest segment of the bakery & cereals market in India, accounting for 50.9% of the market's total value. The Bread & rolls segment accounts for a further 20.7% of the market. Convenience stores form the leading distribution channel in the Indian bakery & cereals market, accounting for a 59.2% share of the total market's value. Food & drinks specialists accounts for a further 21% of the market.

In 2024, the Indian bakery & cereals market is forecast to have a value of $11,682.6 million, an increase of 49% since 2019. The compound annual growth rate of the market in the period 2019–24 is predicted to be 8.3%.

The Indian bakery & cereals market has experienced strong value growth and volume growth in recent years. Britannia is the leading company in the market, holding the largest market share in 2019. Parle Products Pvt Ltd and ITC Limited also have a strong presence in the country, accounting for the second and third largest value shares in the same year. Artisanal producers - i.e. small/independent bakeries that produce their own products for sale (usually onsite) - hold a significant position in the market.

India based multinational Britannia is the leading player in the Indian bakery & cereals market, accounting for 23.9% of the market's value in 2019. The company accounted for value shares of 37.5%, 22.3% and 10.8% in cookies (sweet biscuits), cakes, pastries & sweet pies and bread & rolls segments, respectively in 2019. India based multinational Parle Products Pvt Ltd is the second leading player in the Indian bakery & cereals market, accounting for 20.7% of the market's value in 2019. The company accounted for value share of 50.6% and 29.9% in savory biscuits and cookies (sweet biscuits) segment in 2019. Indian based multinational ITC Limited has the third largest presence in the Indian bakery & cereals market, accounting for 5.5% of the market's value in 2019. The company accounted for value shares of 9.7% and 5.0% in cookies (sweet biscuits) and savory biscuits segments, respectively in 2019. Artisanal Producers accounted for 14.3% of sales in the Indian bakery & cereals market in 2019; private label brands accounted for a further 1.5% of the market's value.

Parle G (owned by Parle Products Pvt Ltd) and Sunfeast (owned by ITC Limited) were the most popular brands in the Indian bakery & cereals sector, accounting for value shares of 9.9% and 5.5%, respectively, in 2019. Furthermore, Britannia's Good Day brand is also a popular brand in the market, holding a value share of 5.4% in the same

4.13.8.1.2. Clusters within the state: Ludhiana

Ludhiana is known as the industrial capital of Punjab. Under the food processing sector, bakery and soya processing are quite common in Ludhiana. There are a number of popular brands of bakery products like Bonn, Kitty, Cremica and Supreme. There are around 200 bakeries and soya industries under MSME sector. These industries are located in different locality like Sarabha Nagar, Hussainpura, Kohara, Bhai Himmat Singh Nagar. Most of the micro and small bakeries has mainly captive retail outlet, which bake in the back yard and sell at the front outlet. There are also established bakery units having production unit at one place from where all the products are made and distributed to different retail shops. Ludhiana bread industry enjoys the distinction of supplying bread to the entire north region comprising Punjab, Haryana, Himachal Pradesh, Chandigarh, parts of Rajasthan, Uttaranchal and Uttar Pradesh.

The bakery units in Ludhiana cluster are very popular for their tasty, quality and variety of baked food items like rusk, paav, pizza, bread, bun, biscuits, cream roll, matthi, namkeen, toasts, puffs and cakes. These products can be grouped primarily into three types of products such as (1) Breads and buns, (2) Cookies and biscuits and (3) Macaroons. These products have further categories based on their ingredients like there are cakes, which are made up of chocolate, strawberry, pineapple, etc. Products like cakes are custom made to meet the demands of customers. The production levels of bakeries quite varying based on demands. The production and installed capacity of the similar industries in the cluster vary from one unit to another; even production of a unit is also not constant during the year. The production data is generally available only in terms of number of pieces produced for a particular product.

Different ingredients used for preparation of bakery products include maida, sugar, ghee/ vegetable oils. The finite share of each ingredient depends on type of bakery product and bakery involved in making those. These ingredients are sourced from local retails market by small bakeries but medium units make bulk procurement from wholesalers.

The weight of products depends on their type e.g. bun ” 240 mg, papdi ” 275 gm and cream roll ” 750 gm. Of these, cream roll fetches better revenues. A vast majority of these bakery products caters to local market. The base ingredients across all bakery products include maida, wheat powder, ghee and vegetable oil, which may be around 70% except for papdi/matthi (100%).

The total turnover of bakery and soya processing industries in Ludhiana cluster is estimated to be about Rs 125 crore with annual aggregate production about 2500 MT (excluding 7 large bakeries). The bakery industries provide direct or indirect employment to more than 6000 people.[49]

Major Player in the district are as follows;

Kitty Industries Pvt. Ltd.- It is one of the largest manufacturers of bread and bakery products. They are into business since 1977 with registered office at Ludhiana. The unit is manufacturing all types of Breads like White, Brown, Whole Wheat & Fruit in various sizes. The unit is also manufacturing all type of Bakery items like Pav Buns, Pizza Base, Fruit Buns, Burger Buns, Rusks & Toast, Eggless Biscuits, Eggless Cakes, Bar Cakes & Muffins, Breadcrumbs & coatings, & Traditional sweets in different Sizes & Packaging. The marketing network is spread in the states of Punjab, Chandigarh, Haryana, Himachal Pradesh, Uttaranchal, Western U.P., Rajasthan and Jammu & Kashmir. The products are distributed in these states through a chain of approx. 1750 distributors.

The company has adequate infrastructure including its own fleet of 200 vehicles, company's own workshop to have smooth operations to ensure timely, fresh supply of bread and other products[50].

[49] Cluster profile-Ludhiana Bakeries
[50] Kitty Bread official website

Bonn Nutrients Pvt. Ltd.- is one of the largest bread makers in North India. They are into business since 1985 in Ludhiana. It holds 67 per cent market share in the region, producing nearly 600,000 loaves daily. Apart from a range of breads, Bonn Nutrients makes an assortment of buns, cakes, cookies, rusk, and biscuits in its bakeries at Ludhiana and Kapurthala in Punjab, as well as at its franchise and contract manufacturing units in several other states in the north. From just Rs 65 crore in 2004/05, its turnover has shot up to Rs 400 crore today. It also exports some of their exclusive products to USA[51].

Mrs. Bector's Cremica- The company is into operations since 1985 in Ludhiana. Operating from fully equipped factories with a total capacity (Owned + Contractual) over 1, 02,600 metric tonnes per annum. Cremica specializes in producing an array of biscuits and cookies. Market across the globe and offer the best & premium products in 64 countries.

Minor Player:

There are more than 100 micro food enterprises in the cluster have a turnover of less than Rs 2.5 lakh per month involved in bakery. A few units are of medium in size (20 numbers) with a turnover of over Rs 25 lakh per month.

These bakery units in Ludhiana are very popular for their tasty, quality and variety of baked food items like rusk, paav, pizza, bread, bun, biscuits, cream roll, matthi, namkeen, toasts, puffs and cakes. Products like cakes are custom made to meet the demands of customers.

Eg- Sharman Jain Sweets Pvt. Ltd., Sita Ram & Sons, Lyallpur Foods, Om Prakash Confectioners and Bakers Pvt. Ltd.

4.13.8.2. Bakery products

4.13.8.2.1. Bakery Products

The bakery segment in India can be classified into the three broad segments of bread, biscuits and cakes. Today, bakery is no longer restricted to bread, biscuits, cakes and pastries as it was traditionally known and now classified in terms of state and art technology. Other bakery products which are becoming popular now a days are Pastries, Danish Pastries, Croissants, Rusk, Pizzas, Pancake, Crisp Bread, Bread Sticks, Kulchas, Crackers, Garlic bread, fruit bread, Focaccia, Buns and Pav, Ciabatta, French Baguette and Rye Bread etc.

4.13.8.2.1. Manufacturing process of Bakery Products

The major steps involved in bakery products are mixing of ingredients, shaping and sizing, baking, curing and packing & dispatch. The generic process steps followed by the unit are briefed below:

- **Raw material procurement and weighing:** Raw materials such as sugar, flour, ghee and other ingredients are procured and weighed as per recipe requirement. Weighing is done carefully to avoid any changes in proportions of ingredients which otherwise may affect the product quality.
- **Raw materials mixing, dividing and shaping:** Different ingredients are mixed in blending machine and poured into the moulds as per required shapes. In some products, the moulds are cut into various sizes.
- **Resting/proofing and baking:** The prepared moulds are kept for yeast action where mixer of ingredients balloons up in case of buns and breads. The fermented products are baked in ovens at different temperatures as per product type. Baking operation is done in batches.
- **Cooling and cutting:** The baked products are taken out and kept for natural cooling. Cutting of the baked products in case of buns and breads is done manually and then sent for packing.
- **Packing and dispatch:** The final products are packed in the plastics wraps and sent to retail shops.

The generic production steps for bakery products are shown in figure.

[51] Bonn official website

Figure 13: Process flow for bakery products manufacturing

4.13.8.2.2. Market demand of value added products

The increasing urbanization and income offer huge scope for marketing of fruit based products. Urban organized platforms such as departmental stores, malls, supermarkets can be attractive platforms to sell well packaged and branded bakery products.

4.13.8.3. Identified Gaps

Various gaps were identified at the firm and cluster level, where work needs to be done in order to increase the scale of activities for ODOP in cluster districts. Following are the major firm level and district level gaps identified through stakeholder consultations.

S. No	Sectors	Gaps	Recommendations
1	Skill training needs	Lack of technical know-how on safety and hygiene maintenance	Training and capacity building with special focus on meeting the food safety requirement and maintaining hygiene during production process
2	Branding and marketing	Inability to market the product resulting in lower visibility.	Creating a common brand under the PM FME scheme for marketing of bakery and other value-added products
3	Technologies	Lack of awareness about new and innovative technologies	Helping the existing units to upgrade their structure through individual enterprise component of PM FME.

4.13.8.4. SWOT Analysis

As mentioned earlier, bakery has been selected as ODOP for the Ludhiana district. Following is the SWOT analysis for the bakery product in these districts.

SWOT Analysis	
Strengths: • Presence of large number of units. • Readily available market due to the proximity to important urban hub of Ludhiana. • Production of good variety of products.	**Weakness:** • Perishable nature of some products. • Requirement of large capital investment in some cases. • Lack of access to modern machinery for the micro processors.

Opportunities:	Threats:
• Opportunity for leveraging the economy of scale through common branding. • Abundance raw material availability for scaling up the production. • Opportunities for collaboration with organized retail players for the sale of the product.	• Increasing production cost due to raw material prices. • Lack of training and capacity building in order to meet the hygiene regulatory requirements

4.13.8.5. Way Forward: Areas of interventions & suggestions

Based on the challenges faced and prevailing conditions following interventions are required;

- Technology upgradation/modernization of existing micro food enterprises
- Support for branding and marketing
- Capacity building to follow Good Management Practices (GMP).

4.14. Faridkot

4.14.1. Socio economic profile

Faridkot district is created by Punjab Government by re-orienting parts of the adjoining Moga, Muktsar, and Bhatinda districts. The district shares common boundaries with Moga, Bhatinda district in the east, Ferozpur district in the North and West and Sri Muktsar Sahib district in the south. It is in the Malwa region of the state. The district with an area of 1419 Sq. Km. has the unique distinction of being one of the smallest districts in the state. The district is well connected with Ferozpur and Bathinda by Rail and road

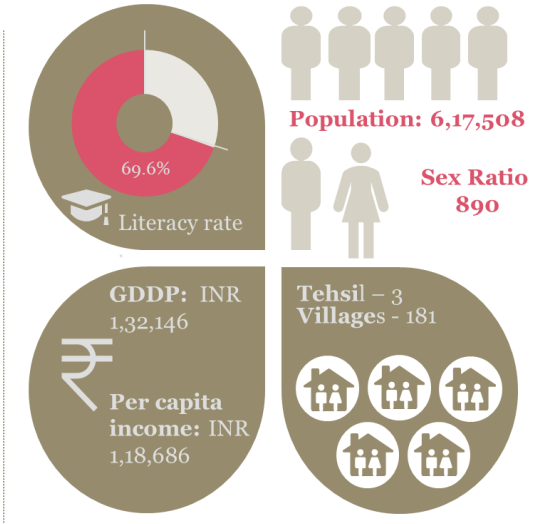
The district derives its name from the city of Faridkot, which was founded, according to local tradition, by Raja Mokalsi more than 700 years ago. The name of the place was changed to Faridkot after the name of Baba Farid. The history of the Faridkot District pertaining to the ancient period has been traced to the Indus Valley Civilization. A vast area, including the present area of Faridkot District was under the influence of Indus Valley Civilization

Faridkot city is the district headquarter and the district is divided into three tehsils and three blocks namely; Faridkot, Kot Kapura, Jaito. The district has 181 villages.

The district Gross District Domestic Product (GDDP) and per capita income during 2015-16 at current prices was marginally below the state average.

4.14.2. Demographic profile

According to the 2011 census Faridkot district has a population of 6,17,508 of which male and female population were 52.90% and 47.10% respectively. Out of the total population of the district, 64.9 % is rural and 35.1 % is urban. The district has a population density of 424 inhabitants per Sq Km. Its population growth rate over the decade 2001-11 was 12.1%. The district has a sex ratio of 890 females per 1000 males and a literacy rate of 69.6%.



4.14.3. Climate and Rainfall

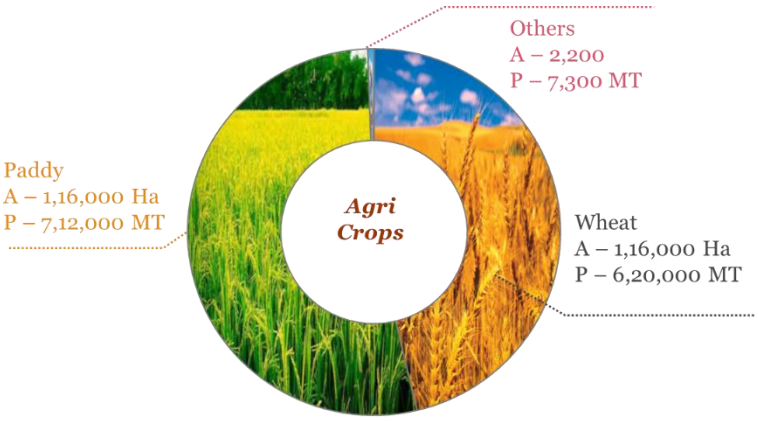
The climate of the Faridkot District is mainly dry, characterized by a very hot summer, a short rainy season and a bracing winter. It is intensely hot during the summer and the dust laden winds which blow, especially in the sandy parts, are very trying. The maximum temperature may go beyond 47^0C on individual days. With the onset of the monsoon there is an appreciable drop in the day temperature. January which is the coldest month. The average annual rainfall in the district is 323.9 mmSome rainfall occurs during the pre-monsoon months, mostly in the form of thundershowers.

4.14.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is 87%. The district has the cropping intensity of 194%. Wheat and paddy are the main Rabi and kharif crops of the district. The other major crops of the district is cotton. The district also grows Barley and rabi oilseed in small quantities.

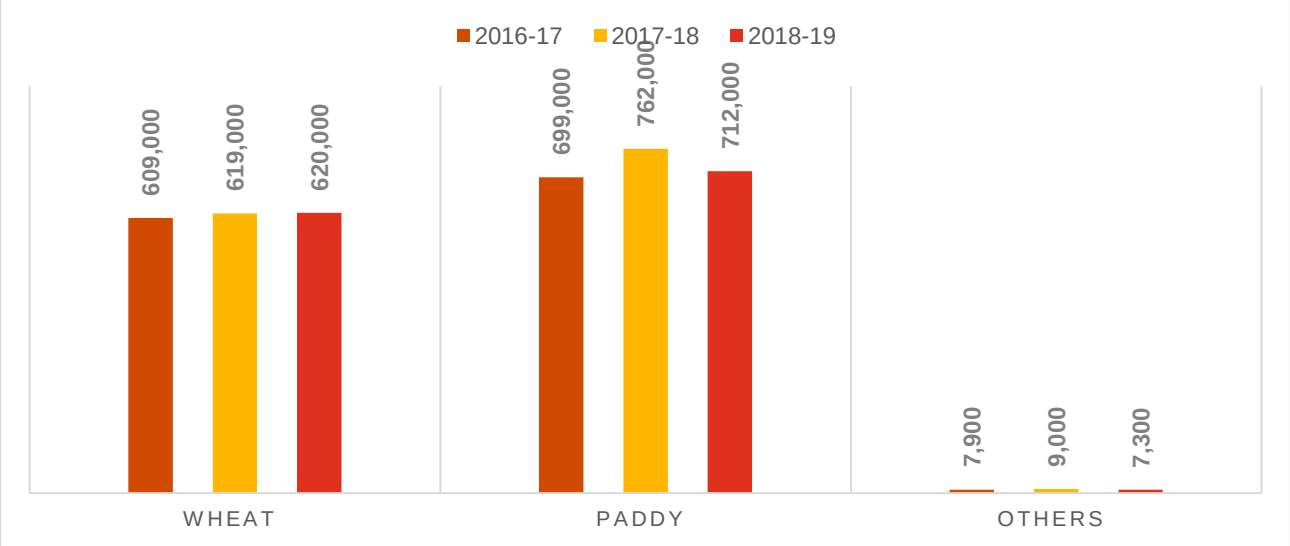
Production Trends- Agricultural crops

Wheat has shown an increase in production in 2018-19 from previous years. However, other field crops including paddy have shown an erratic trend when it comes to data of the years from 2016-17 to 2018-19.



Graph 107: Major Field crops grown in district Faridkot (2018-19)

Source: Department of Agriculture, Govt. of Punjab

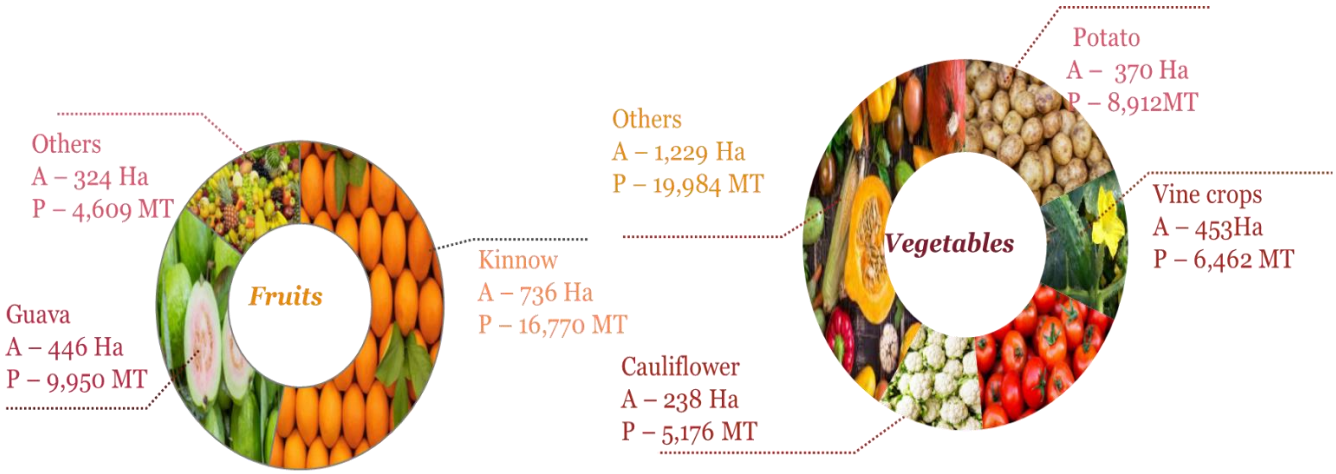


Graph 108: Production trends of agricultural crops in Faridkot district

4.14.5. Horticulture profile

The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc. and that too inlimited quantity. Overall there is cumulative growth of over 28% in the area under vegetables in last four years (from 2016-17 to 2019-20).

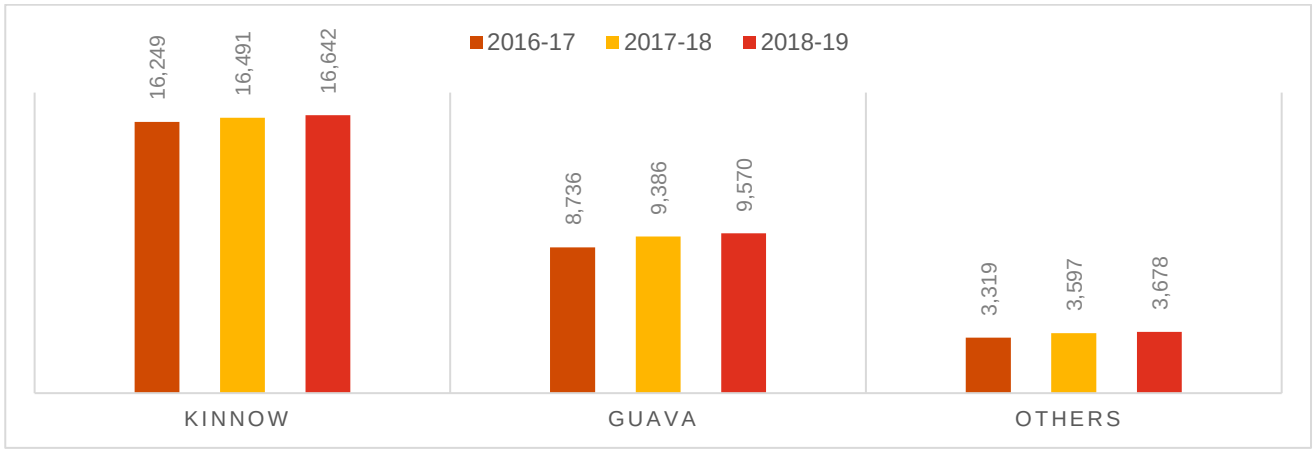
Out of all vegetables, maximum area is under vine crops. The district produces a wide variety of fruits, and kinnow, guava and ber are the major fruits of the district , The district reported a cumulative growth of nearly 12% in area under all fruit crops taken together in last four years from 2016-17 to 2019-20.



Graph 109: Major fruits and vegetables grown in the district Faridkot (2019-20)

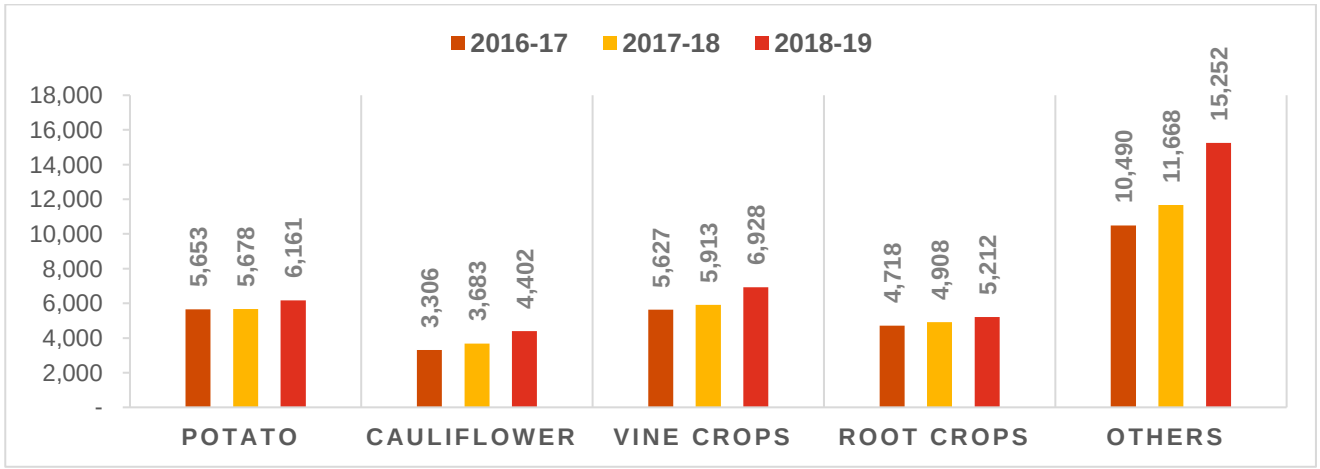
Production Trends- Fruits

Production over the 3 years from 2016-17 to 2018-19 has shown a consistent increase in case of all fruit crops including Kinnow and guava. Same is depicted in the graphical representation below:



Graph 110: Production trend of fruits in Faridkot district (MT)

Production Trends- Vegetables

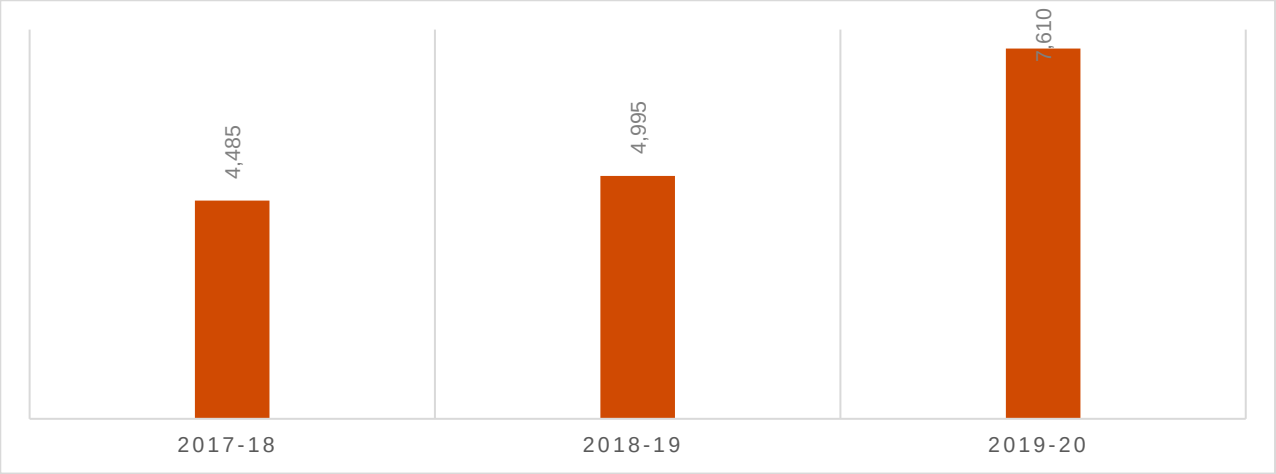


From the above-mentioned graph, it is evident that production of all the vegetable crops in Faridkot district have shown a gradual increase in production from 2016-17 to 2018-19. Where potato production has shown an increased growth of 8.99 % in 2018-19 than in 2016-17; cauliflower and root crops have also shown an increase by 33.15 % and 10.47 %, respectively.

4.14.6. Allied activities

Production trend- Fish

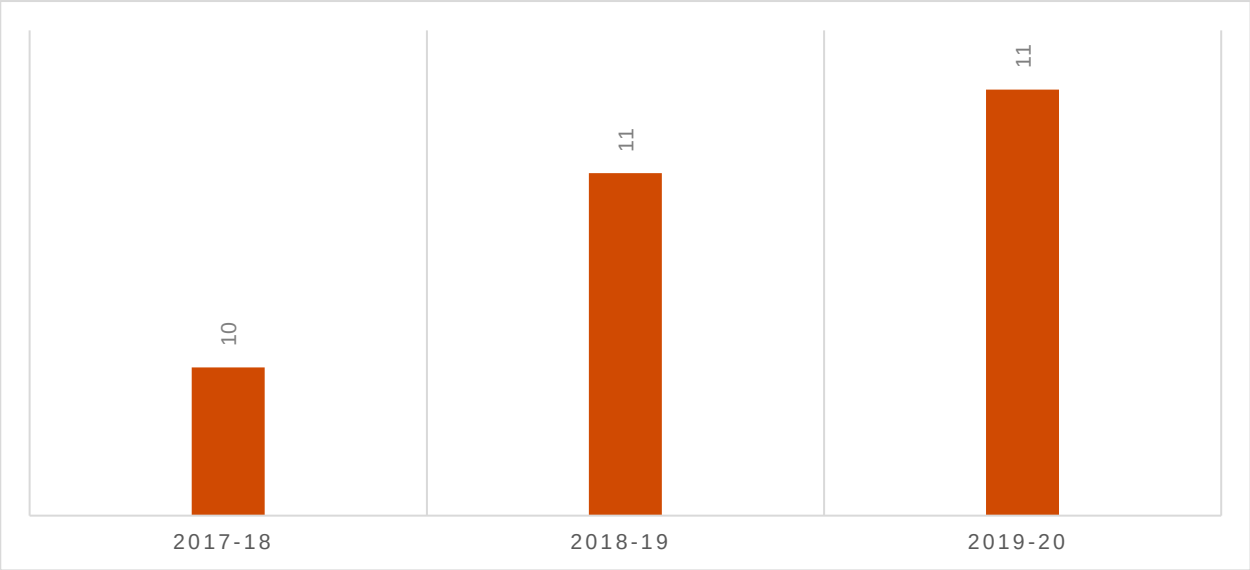
The production of fish is consistently increasing in last three years with 5,006 MT in 2019-20. The district produces both IMC varieties of fish and shrimp.



Graph 111: Production trend of fish (MT) in Faridkot district

Production trend- Milk

The district is constantly increasing production of milk from 9.95 lakh litre/day in 2017-18 to 10.98 lakh liter/day in 2019-20.



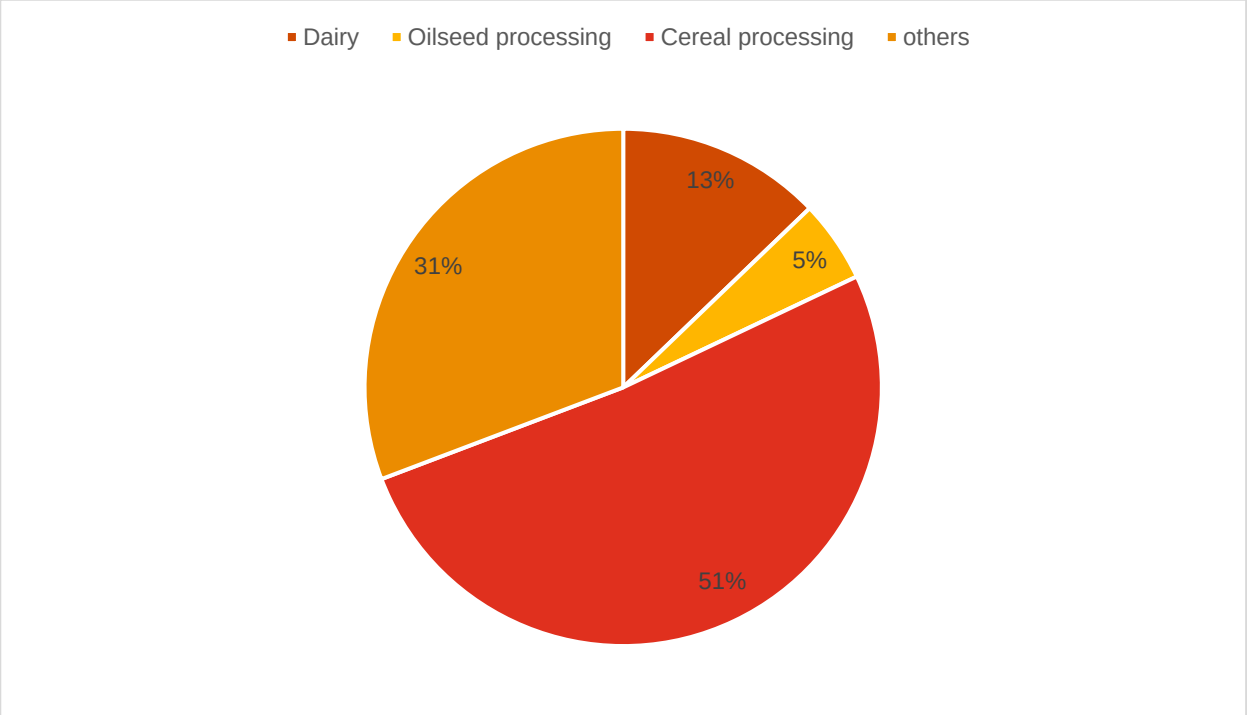
Graph 112: Production trend- milk in Faridkot district (LLPD)

4.14.7. Industrial profile

There are 2219 registered Micro Small enterprises in the district and 2 registered medium and large enterprises providing employment to 14,171 and 575 persons respectively, as per FY 2014-15.

Table 16: Industry in Faridkot (2014-15)

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	2219
2	Registered Medium & Large Units	No.	2
3	Employment in MSE Sector	No.	14171
4	Employment in Large and Medium Industries	No.	575
5	No. of Industrial Areas	No.	1
6	Turnover of MSE Sector	Rs. Lakh	38576
7	Turnover of Large & Medium Sector	Rs. Lakh	50368



Graph 113: Spread of micro food enterprises in Faridkot district

As per the stakeholder interaction, 51% of the micro food enterprises are into cereal processing. The district has numerous rice mills of average capacity of 2 MT/hr and atta chakkis manufacturing wheat flour etc. About 5% of the micro food enterprises are into oilseed processing including rice bran oil extraction. There are no major unit in the district processing fruits and vegetable. there are number of individuals/micro enterprises, FPOs/SHGs etc. manufacturing and marketing products like honey, pickles etc. There are number of bakeries also in the unorganized sector which are categorized under others.

4.14.8. ODOP

Milk and Milk products has been selected as ODOP of the district.

The district is constantly increasing production of milk from 9.95 lakh litre/day in 2017-18 to 10.98 lakh liter/day in 2019-20. District Faridkot is one of the smallest districts, yet it produces large quantity of milk.

The Faridkot Dist. Coop. Milk Producers Union Ltd. has a milkshed area of Faridkot comprises 405 No's of Villages of old Distt. Faridkot currently includes District Faridkot, & Shri Muktsar Sahib. MU Faridkot has its two own Milk Chilling Centers, one at Doda in District of Shri Muktsar Sahib and second at Baja Khana in District of Faridkot having chilling/storage capacities of 25,000 LPD each. Milk Union is also collecting milk at Sadiq by hiring ice factory having Chilling/Storage capacity of 20,000 LPD. Milk Union has also established Three BMC's having capacity 5000 Ltrs. each at MCC – Aulakh in a hired building of Gram Panchayat, Aulakh having Chilling/Storage capacity 20,000 LPD. Milk Union, Faridkot has installed BMC's of 1000 to 2000 LPD capacity in different villages in the Milkshed area of Faridkot to cool the milk instantly at village level for maintaining its quality besides installation of various equipment for milk testing in its Milkshed Area.

The district has two medium sized milk processing plants. Besides, there are over 200 milk producers and processors manufacturing paneer, cream, khoya, curd etc. **There is a good scope to encourage such milk producers and sweet meat units to up-grade their facilities and set up new units.**

4.15. Mansa

4.15.1. Socio economic profile

Mansa District is located in the southern part of Punjab State and covers an area of 2,198 sq. km. It is bounded by Sangrur district in the East, Bathinda Districts in the North and west, Barnala District in the North and Haryana State in the South. **It is one of the smallest districts in terms of area in the State.** The district was formed in 1992. Prior to that it used to be the part of the erstwhile State of Patiala, Bathinda and Faridkot collectively were known as Phulkian state. The district Mansa forms part of Satluj-Ganga plain and is characterized by low lying flat area. The river Ghaggar crosses the district through its Southern part. The district falls in Western zone as per agro climate of Punjab.

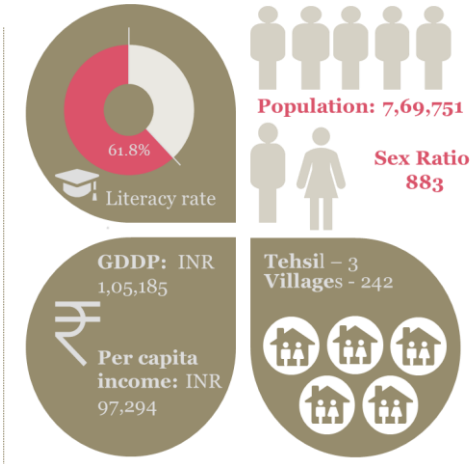
The district name, Mansa has been derived from the name of a *Faquir* named Mansa. The ancient history of Mansa district has been traced to the Indus Valley Civilization.

Headquarters of the district is located at Mansa town, the district has three tehsils namely, Mansa, Sardulgarh and Budhlada. The district comprised of 5 blocks name as Mansa, Bhikhi, Budhlada, Sardulgarh and Jhunir. The major towns of the district include Mansa, Bareta, Budhlada, Sardulgarh and Bhikhi. According to the 2011 Census, the district has 242 inhabited villages.

The district Gross District Domestic Product (GDDP) and per capita income during 2015-16, at current prices, was much below than the state average.

4.15.2. Demographic profile

According to the 2011 census, Mansa district has a population of 769,751 of which male and female population were 53.10% and 46.90% respectively. Out of the total population of the district, 78.7 % is rural and 21.3 % is urban. The district has a population density of 350 inhabitants per Sq Km. Its population growth rate over the decade 2001-11 was 11.8%. The district has a sex ratio of 883 females per 1000 males and a literacy rate of 61.8%.

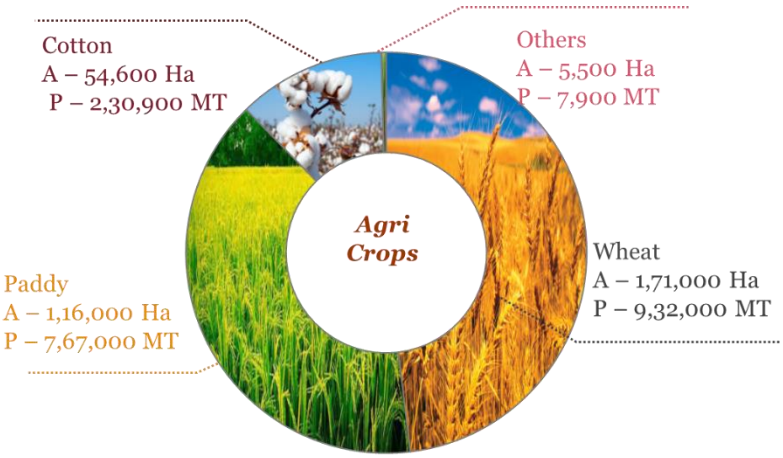


4.15.3. Climate and Rainfall

Geographically Mansa district falls in the Central Southern part of Punjab, the district has a very hot summer, mild rainy season and dry but bracing winter. The climate, on the whole, is dry in the district. June, normally is the hottest month of the season. scorching dust-laden winds, commonly known as loo, blow during the hot season. The normal average annual rainfall of the district is 378.2 mm. The monsoon contributes about 83% of annual rainfall and 17% of the annual rainfall occurs during Non-monsoon months of the year

4.15.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is 86%. The district has the cropping intensity of 198%. Wheat, paddy and cotton are the main Rabi and kharif crops of the district. The district also grow Bajra and rabi oilseed and kharif pulses in small quantity.

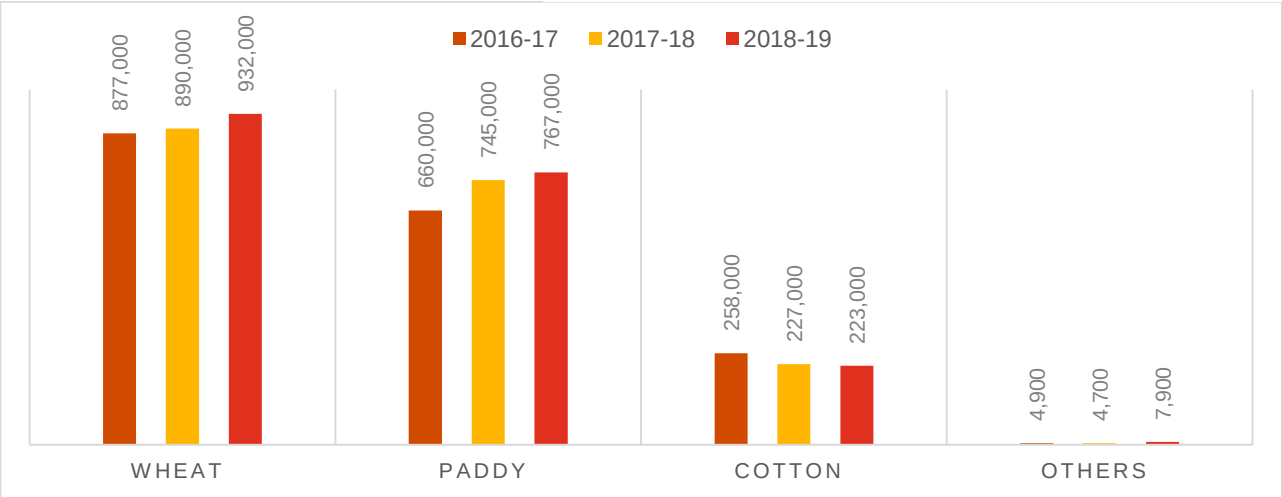


Production trends-Agricultural crops

Production of wheat and paddy has increased by 6% and 16% over last three years. However, production of cotton has decreased by 14%. Decrease in cotton production is mainly attributed to outbreak of sucking pest like whitefly.

Graph 114: Major Field crops grown in district Mansa (2018-19)

Source: Department of Agriculture, Govt. of Punjab



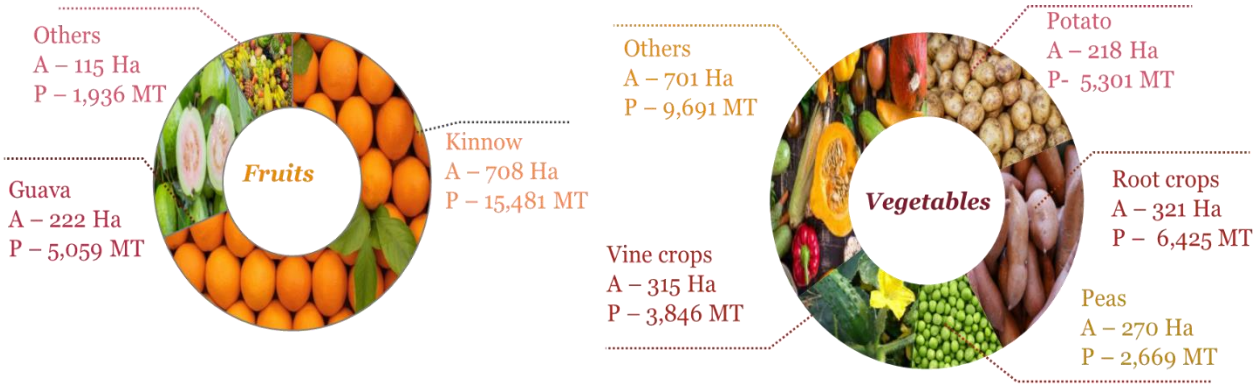
Graph 115: Production trends of agricultural crops in Mansa district

Source: Department of Agriculture, Govt. of Punjab

4.15.5. Horticulture profile

The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc. and that too unlimited quantity. Overall, there is cumulative growth of 42% in the area under vegetables in last four years (from 2016-17 to 2019-20).

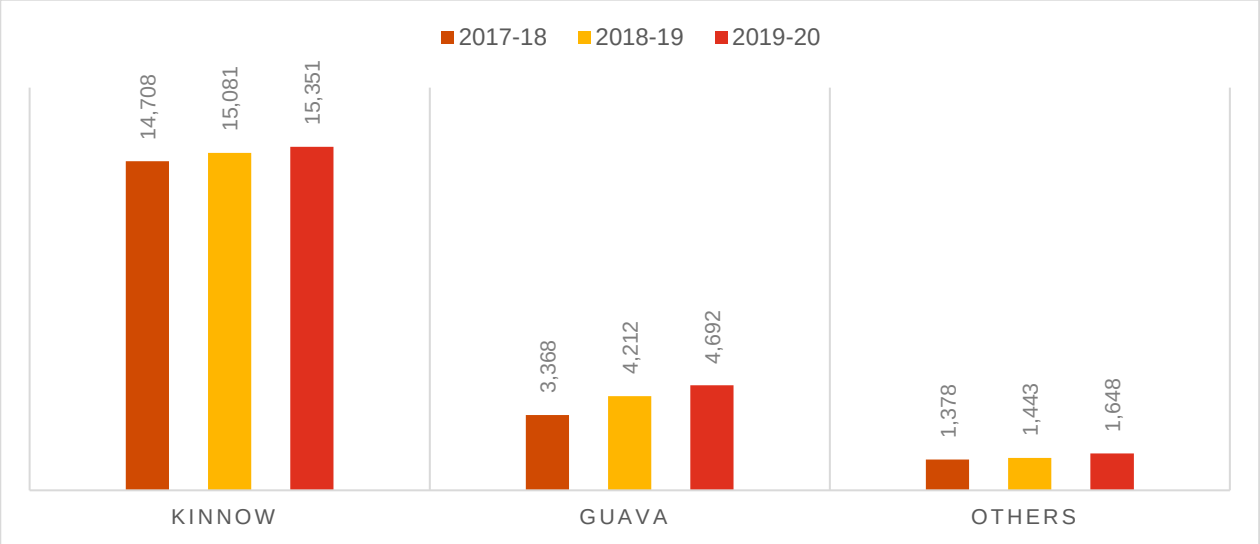
Out of all vegetables, maximum area is under vine crops (bitter gourd, cucumber, sponge gourd etc). However, the area and production is marginal as compared to the area and production of same crops in other districts of the state The district produces a wide variety of fruits like kinnow, guava and ber and that too in limited quantity. The district reported a cumulative growth of 17% in area under all fruit crops taken together in last four years from 2016-17 to 2019-20.



Graph 116: Major fruits and vegetables grown in the district Mansa (2019-20)

Production trend- Fruits

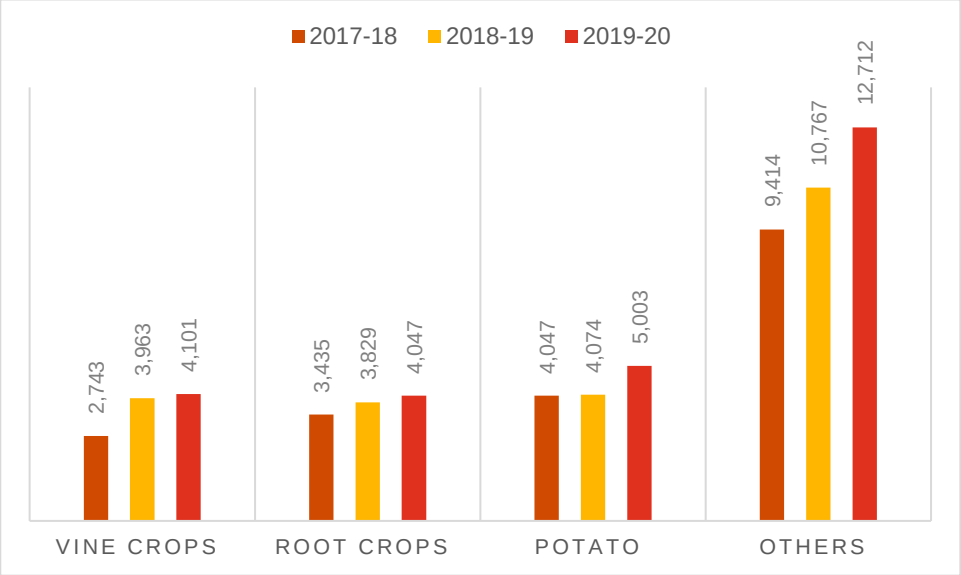
From the graph it is evident that production of all major fruits has shown increasing trend of production.



Graph 117: Production trend of fruit crops in Mansa district (MT)

Production trend- Vegetables

From the graph it is evident that production of all major vegetable crops has shown increasing trend of production.

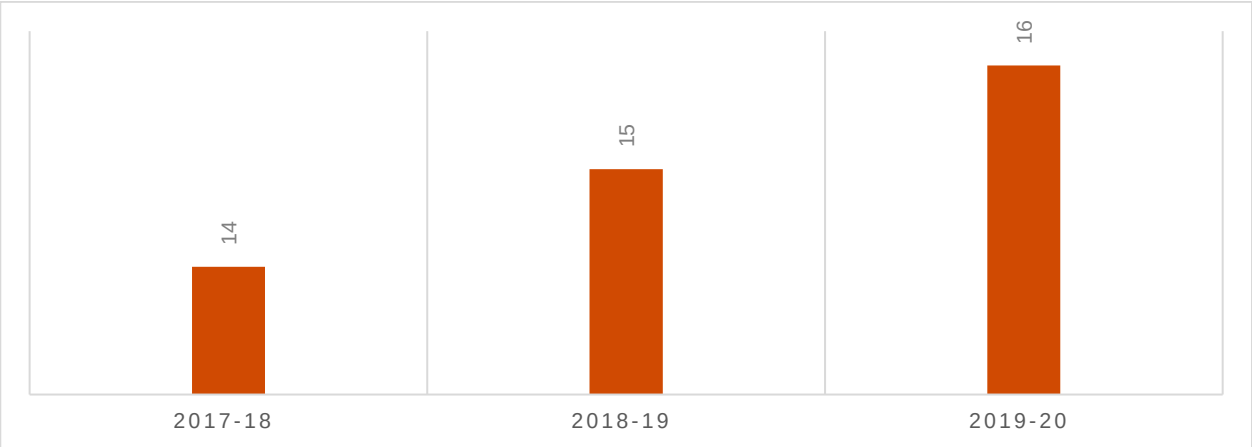


Graph 118:Production trend of vegetables in Mansa district (MT)

4.15.6. Allied activities

Production trend-Milk

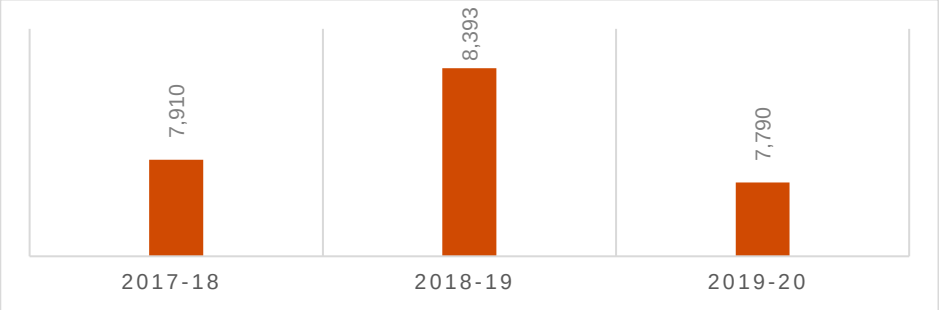
The trend in production of milk in last three years in the district is as under. There has been over 13% increase in the production of milk in last three years.



Graph 119: Production trend of milk in Mansa district (LLPD)

Production trend-Fish

The production of fish has recorded an erratic behaviour during last three years. The production declined from 8,393 MT in 2018-19 to 7,790 MT in 2019-20, a fall of 8% in a year.



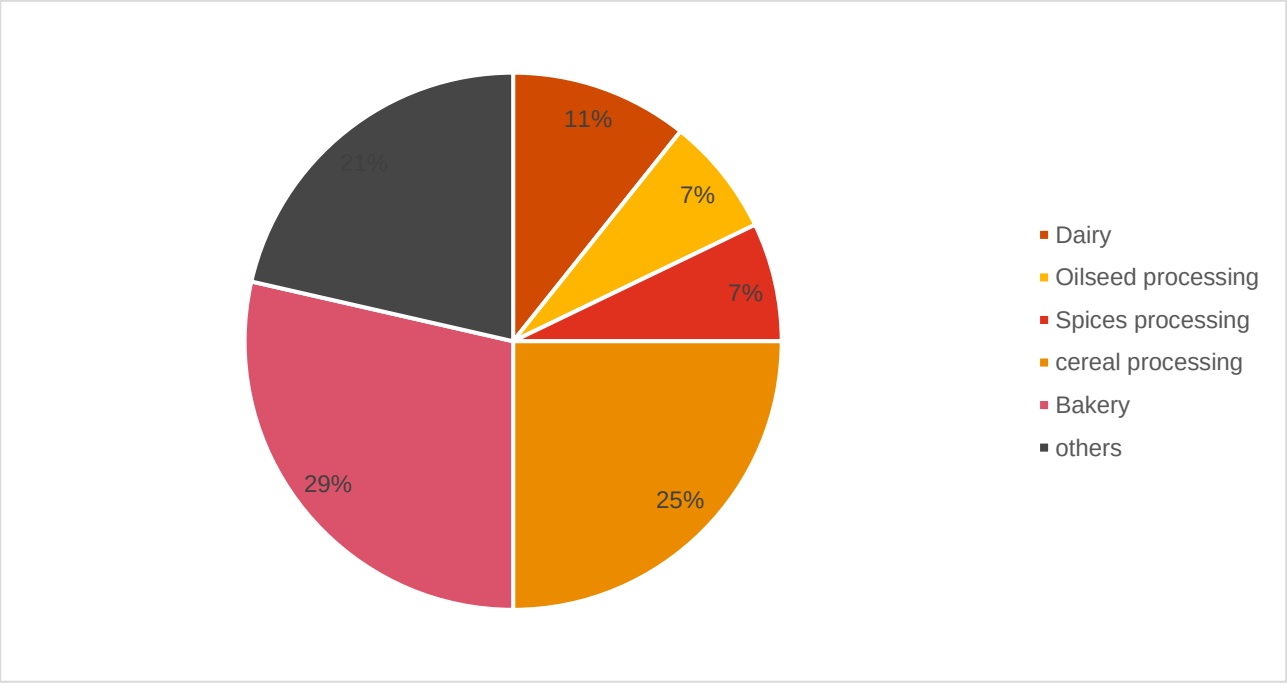
Graph 120: Production trend of fish in Mansa district (MT)

4.15.7. Industrial profile

There were 944 registered Micro Small enterprises in the district providing employment to 6468 persons. Upto 2014-15, the district has not reported any registered medium and large units in the district.

Table 17: Industry in Mansa

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	944
2	Registered Medium & Large Units	No.	0
3	Employment in MSE Sector	No.	6468
4	Employment in Large and Medium Industries	No.	0
5	No. of Industrial Areas	No.	
6	Turnover of MSE Sector	Rs. Lakh	57657.74
7	Turnover of Large & Medium Sector	Rs. Lakh	50368



Graph 121: Spread of micro food enterprises in Mansa district

There are +150 wheat flour mills in the district and 100 rice mills of average capacity of 2 MT/hr. There is no major unit in the district for processing fruits and vegetables however there are number of individuals/micro enterprises, FPOs/SHGs etc. manufacturing and marketing products like honey, pickles etc. The district has no

milk plant in the organized sector. Milkfed has installed two chilling centers at Bhikhi and Sardulgarh for storing and chilling the milk for their Bathinda plant. There are over 200 dairies run by individuals and firms who process milk to manufacture paneer, curd, lassi, kulfi, etc. These units are also interested to up-grade their facilities. The district also has over 300 bakery units.

4.15.8. ODOP: Milk and milk products

Milk is a liquid food which is rich in various nutrition and constitutes an important component of human diet since time immoral. Chemically, milk is an emulsion constituting fat and protein in water. Carbohydrates, vitamins and minerals are also present along with fat and protein. Therefore, it has a great nutritional value due to the presence of all the major nutrients . Other than direct consumption, milk of domesticated animals is used for making numerous milk-based products like curd, khoya, cream, butter, cheese, ice cream, paneer etc. Cow milk constitute the largest share of commercial milk production in the world wise as worldwide around 85% of the total milk comes from cows[52].

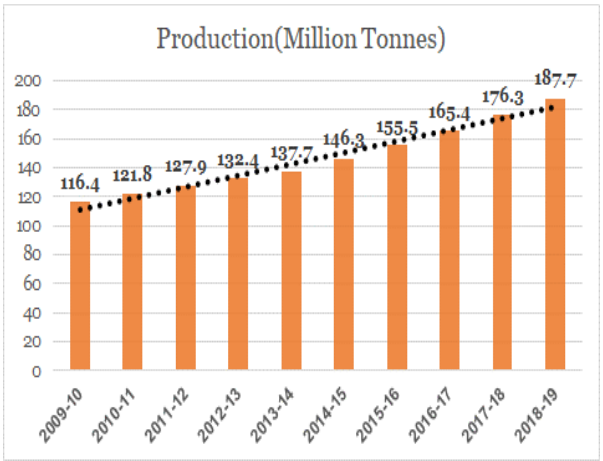
4.15.8.1. Milk Clusters

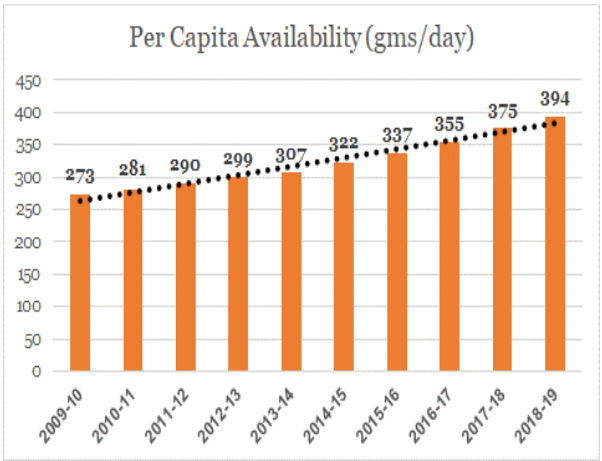
4.15.8.1.1. National Level

India has come a long way in the production of milk and today it is the largest producer of the milk in the world. The total milk production India stands at around 187.7million tones[53]. India was milk deficit nation decade of 1960. Today it is the largest producer of milk in the world and produces nearly 22% of total world's milk production. The per capita availability of milk in India stands at 394gms/day. The per capita milk availability has doubled during last 25 years. This is significant achievement considering the challenges of resource limitation and lack of access to advanced technology faced by the milk producer in India.

Following figure shows the milk production and per capita availability trends in India.

India: Milk Production and Per Capita Availability





[52] *Food and Agriculture Organization of the United Nations: Milk availability Trends in production and demand*
[53] *Statistics- National Dairy Development Board*

Major dairy products exported from India are Skimmed Milk Powder (SMP), butter, cheese, ghee and butter milk. SMP constitutes around 30% of the total export value of milk and milk products from India.

4.15.8.1.2. Clusters in the state

Punjab, known as breadbasket of India due to high grain production also played a pivotal role in ensuring the self-sufficiency for India in the area of milk production. After crop production, Livestock sector is the second largest contributor to the total agricultural GVA as it contributes around 37[54]% of the total agricultural GVA. Milk production contributes to the largest share of GVA in livestock sector. The total milk production in Punjab stands at 12.6 million tonnes, which makes it the 6th largest contributing around 6.7% of the total milk production in the country.

Other than consumption as food, milk also holds an important place from the economics, cultural and societal point of view. Economics and social aspects of milk are especially important in country like India. Dairy industry and milk production is an important source of livelihoods for small and marginal farmers and plays an important role in the rural economy. According to one estimate, share of value output from milk and milk products is around 3% in total GVA of Indian economy. Culturally also, milk is considered a sacred food which is used in many religious customs.

Dairy Sector Highlights: Punjab

Highest Per Capita Milk Availability

Punjab has the highest per capita availability of milk at 1181gms/day. It is significantly higher than the national average of 394gms/day.

High Average Monthly Income from Livestock

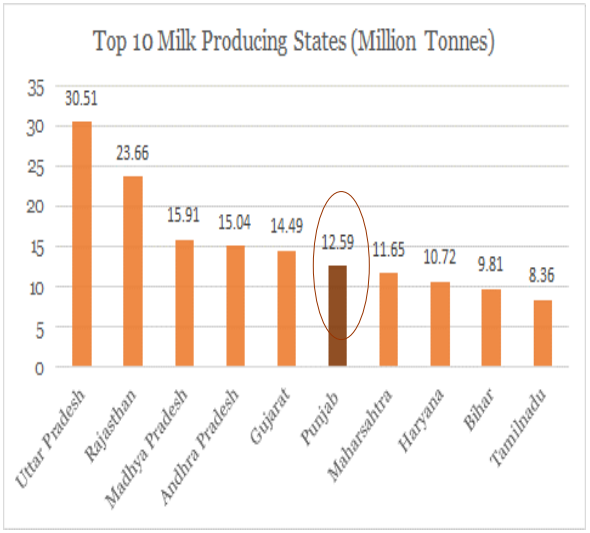
The average monthly household income from livestock is 2nd highest in the country at Rs 5,303/- out of which 91.6% is contributed by milk production

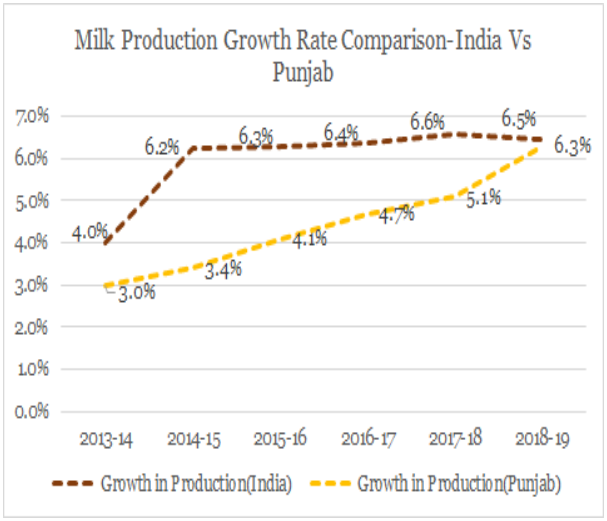
High average milk yield

The average milk yield per cattle in Punjab is 5.27 kg, which is one of the highest in India.

[54] *Punjab economic survey 2019-20*

Punjab: Milk Production and Growth Rate

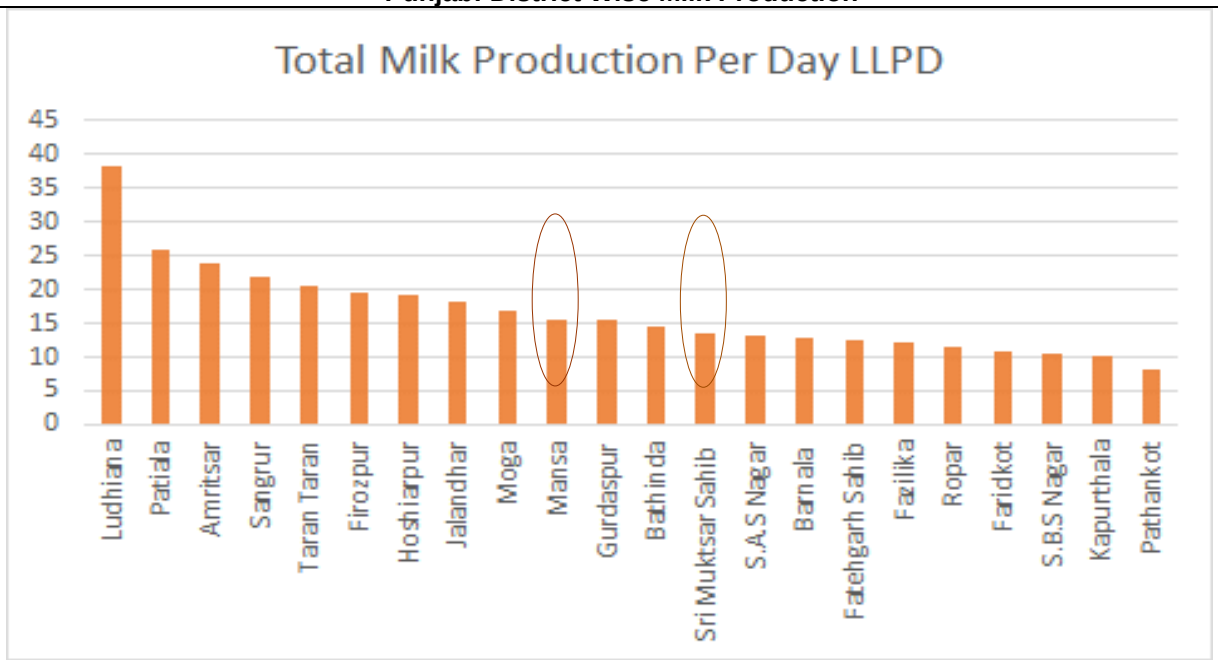




As evident from the figure, the growth rate in milk production for Punjab was lower than all India average from 2013-14 to 17-18. During year 2018-19, the gap in growth rate difference between India and Punjab in milk production narrowed down as milk production in Punjab grew at 6.3%[55]. Following are the major highlights of dairy sector in Punjab.

Milk and milk products has been selected as ODOP for three districts which are Mansa and Sri Muktsar Sahib. Major reason behind the selection of milk and milk products as ODOP for these three districts is the potential of setting up and upgrading processing units in these districts. Ludhiana district in the state has the highest milk production and it is followed by Patiala and Amritsar. Following graph gives the district wise milk production[56].

Punjab: District Wise Milk Production



[55] *Statistics: National Dairy Development Board*
[56] *Department of Dairy, Government of Punjab*

Mansa:

The total average milk production in the district during the Year 2019-20 was 15.67 lakh litre per day and the district comes at 10th rank in the state in the production of milk. During the last three years, there has been over 13% increase in the production of milk. The district has no milk plant in the organized sector. Milkfed has installed two chilling centers at Bhikhi and Sardulgarh for storing and chilling the milk for their Bathinda plant. Verka vehicles collect raw milk of their registered farmers and pour it into the chilling plant. This suggest a scope and potential to setup small processing plants in the area that would help maintaining the quality of milk as also fetching the better price for milk producers. There are over 200 dairies run by individuals and firms who process milk to manufacture paneer, curd, lassi, kulfi, etc. These units may turn up as the potential beneficiaries for the schemes.

Sri Muktsar Sahib:

The total average milk production in the district during the Year 2019-20 was 13.5 lakh litre per day and the district comes at 13th rank in the state in the production of milk. There is shortage of milk processing plant in the district, although bulk milk chilling centres has been established in the district by Verka, Nestle, Chanakya Dairy and others. In the district, most of the farmers and members of dairy associations pour their milk to the verka chilling plant. This district offers considerable potential for setting up of milk processing facilities as there is shortage of the same in the district in spite of significant volume of milk production.

4.15.8.2. Socio economic profile of the producers and processors

There is lack of large-scale processing industry for milk & milk products in the selected districts and most of the processing is done at the local sweet shops. These sweet shops owners comes from middle economic background and generally lack financial capacity to scale up the processing activities.

On production front, it is worth mentioning here that most of the producers are farmers who have taken the occupation of dairy as supplementary income source. Average household have 2-3 milch animals and fodder for the same are arranged from own field. Some of the producers have been able to scale up the activity through following scientific ways of milk production. There are more than 100 large dairy farms in the ODOP districts, which have on an average more than 20 animals.

4.15.8.3. Infrastructure and technology

Villages in the ODOP districts are primary hub of production. One major advantage is the better connectivity of villages to urban center which results in ease of movement and transportation. Milk is a highly perishable product and therefore timely movement is of utmost importance. Majority of the villages in the ODOP districts of Mansa and Sri Muktsar Sahib are well connected to nearest urban hub by road. Power availability is also not a major issue due to the fact that Punjab is a power surplus state.

Bulk milk centre have been established in the ODOP districts, but as such no high-end processing plant is available in the ODOP districts. There is need for high end processing plant where advanced value-added milk products are manufactured. Along with processing, milk procurement infrastructure also needs strengthening in the cluster. Existing cooperative procurement structure needs to be strengthen in order to increase the share organized sector's milk procurement.

4.15.8.4. Human resource and skill set

Most of the milk producer have been involved in the production of milk since long time and have gained useful experience and exposure. Producer need exposure on various aspects in order to improve the productivity. Providing appropriate feed and fodder to milch animal is one such area where producer needs training and capacity building support.

Most of the small-scale processors does not have any kind of formal training or skills and have learnt the process through experience. Majority of the processors are involved in the processing of basic milk products like paneer, sweets, curds etc. There is a need for a push to encourage the processors to undertake the processing of high-end value-added products like flavored milk, where margins are high.

4.15.8.5. Institutional support and support infrastructure

The Punjab state cooperative milk producer's federation also known as Milkfed has been the backbone of institutional structure in the state through its network of village level dairy cooperative societies in the clusters. Bulk of the organized procurement is done through these village level cooperative societies. Although the farmers admit that transparency in these society is one big advantage over other mode of milk sale but expressed their dissatisfaction over the price. Price is generally paid on the basis of fat, which is Rs 660/kg for buffalo and Rs 630/kg for cow milk at present.

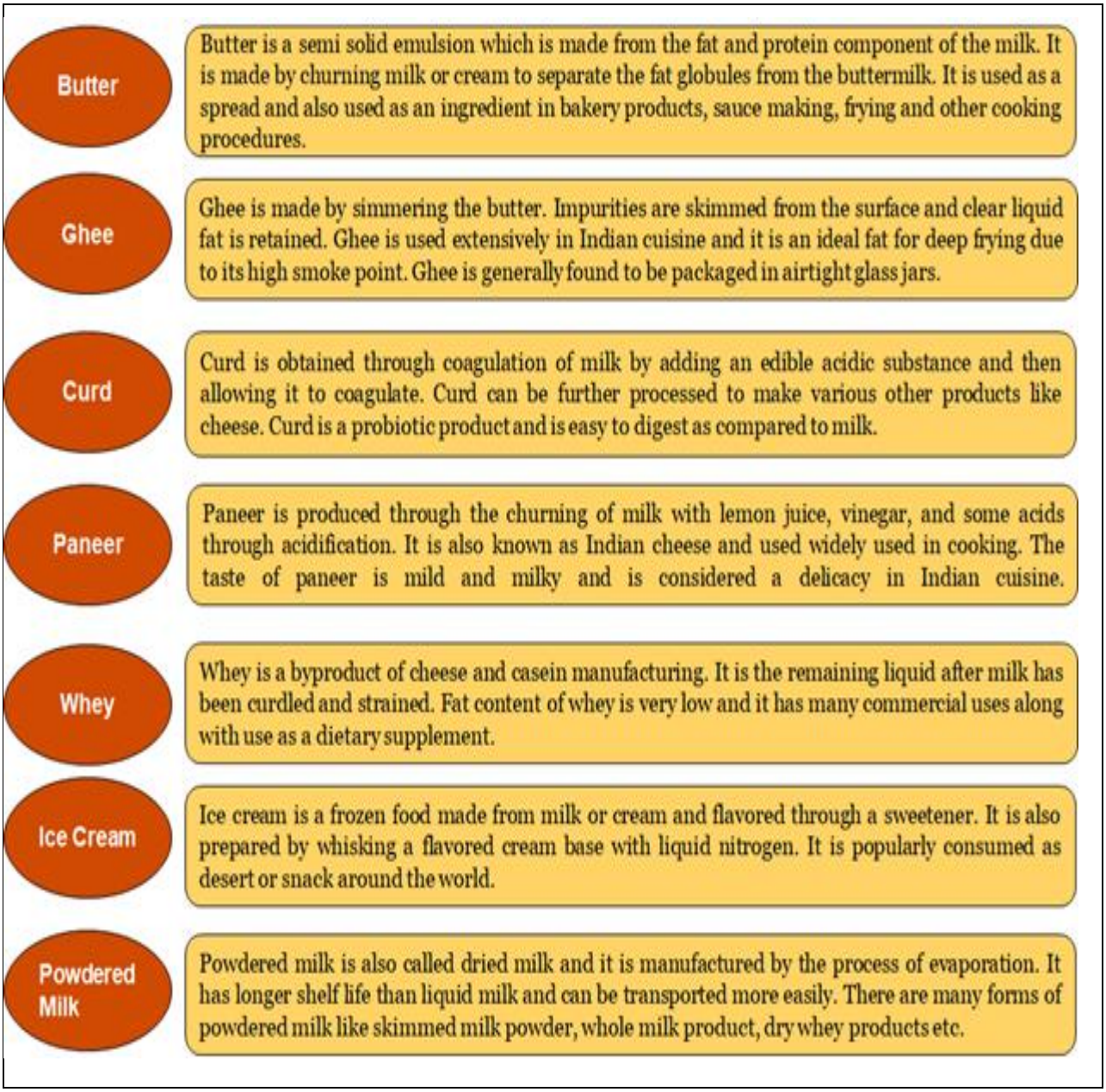
During interaction with farmers producer, it was observed that they are nit very much aware about the cooperative structure and role of village level cooperative societies in it. There seems to be a lack of ownership as impression was that the verka (flagship brand of Milkfed) is procuring the milk. Training and awareness program regarding the institutional structure are need of the hour in order to bring more transparency and increasing the sense of ownership. It was found that the various training programme are conducted through state government's department aimed at productivity enhancement and animal rearing.

4.15.8.6. Processing and Value-Added Products

It has been estimated that around 70% of the milk is processed milk is sold as fluid milk and remaining 30% is used for manufacturing of various value-added products. There are numerous value-added products made through processing of milk. Some of these products form an important component of Indian diet. In Punjab, around 78% of the processing is done by private players[57]. Some products like curd requires very simple processing process which can easily be carried out at home, whereas products like ice cream requires commercial operation for carrying out the processing. Following is the description about some of the popular value-added products made from the processing of milk.

Different Kind of Value-Added Products

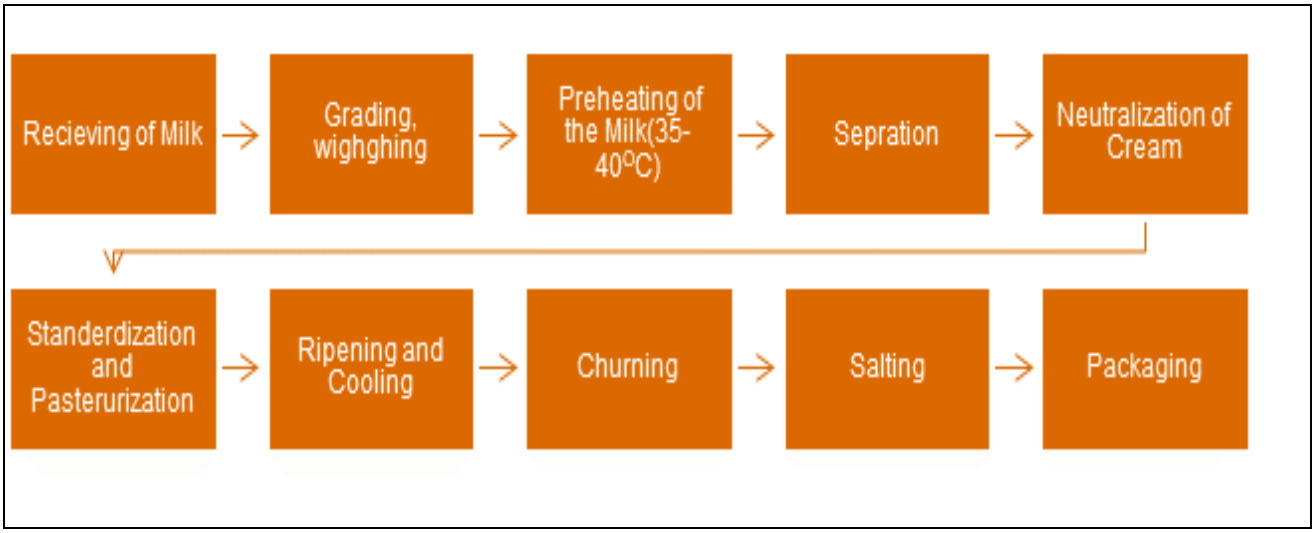
[57] *Basic Animal Husbandry, Dairying and Fisheries Statistics, 2013*



Manufacturing Process for Butter:

Butter is one of the commercially most important value-added product made from the milk. As per industry estimate, total market size of butter in India is around Rs35,00 crore. The manufacturing of butter involves multiple steps from receiving of milk to packaging. Majorly it is made through churning of cream after neutralization. Neutralization is done to reduce the acidity in the cream and to prevent undesirable flavors. After this the standardization of cream is done to adjust the fat content to desired level. Churning is initiated by agitation of cream which causes incorporation of air bubbles into the cream. Eventually butter grains are formed which are separated from the butter milk and salting is done. Following is the step wise process involved in the manufacturing of butter.

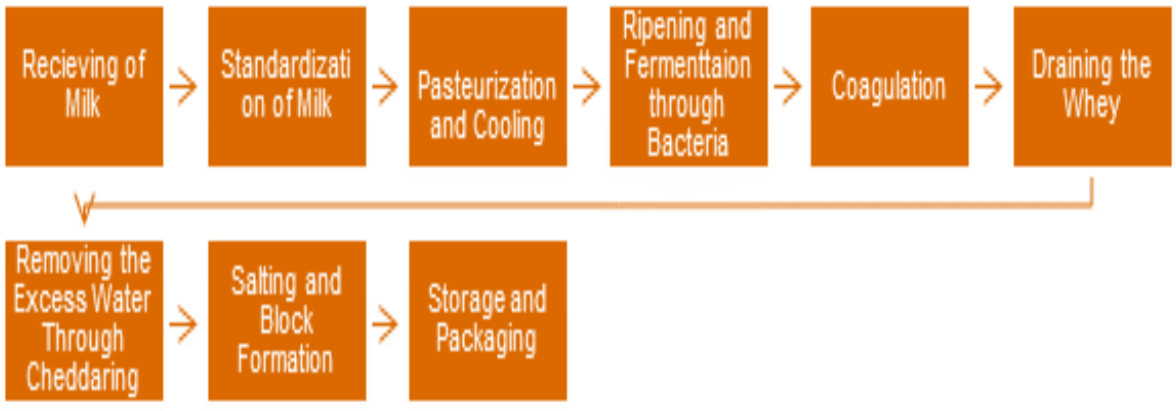
Manufacturing Process of Butter



Manufacturing Process for Cheese:

Cheese is also a very important commercial value-added milk product, which is consumed worldwide. There are numerous varieties of cheese, which are consumed in different parts of the world. Paneer is also a domestic form of cheese and also known as cottage cheese. But it is important to note that there is difference in the commercial manufacturing of cheese and paneer as cheese is made through the process of acidification through bacteria, whereas paneer is made by heated milk with acids like lemon juice, vinegar etc. Cheese has longer shelf life and can be stored in the freezer for consumption. Cheese can be broadly categorized as acid or rennet cheese, and natural or process cheeses. Acid cheeses are made by adding acid to the milk to cause the proteins to coagulate. Fresh cheeses, such as cream cheese or queso fresco, are made by direct acidification. Manufacturing of cheese involves multiple steps from standardization packaging. Following is the

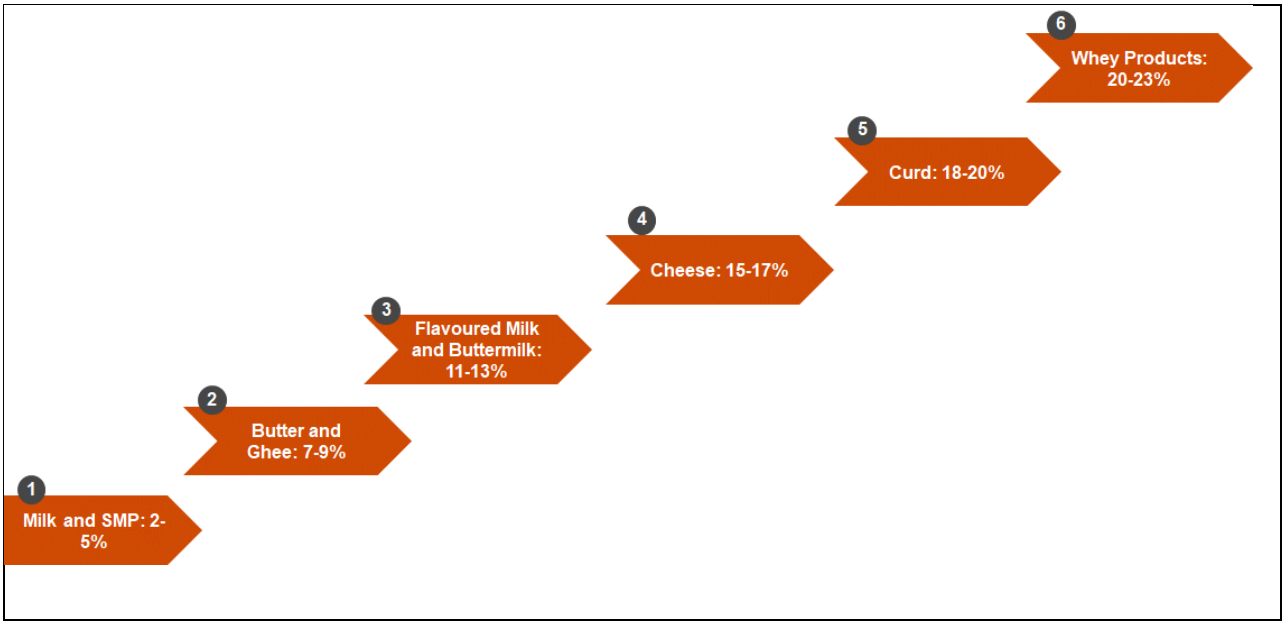
Manufacturing Process of Cheese



Processing of dairy products gives small-scale dairy producers higher cash incomes than selling raw milk and offers better opportunities to reach regional and urban markets. Milk processing can also help to deal with seasonal fluctuations in milk supply. Below is the average EBITDA margin across various value-added products in the dairy sector:[58]

Average EBITDA margin across various value-added products

[58] *CARE Ratings Report (2017): Indian Dairy Industry – driven by value-added products:*



As evident from the figures, liquid milk and SMP has the lowest margin across all the milk-based products. Margins are increased along with the level of processing activities involved. Although the state has made great strides in milk production, full potential has not been realized in processing activities. It is imperative to increase the processing activities for ensuring the greater value generation for milk producers. There also exists opportunities for dairy exports, wherein India's contribution in global trade of dairy products is restricted to a meagre of 0.18% and 0.29%, in terms of quantity and value respectively.

4.15.8.7. Marketing and Value Chain Mapping of ODOP

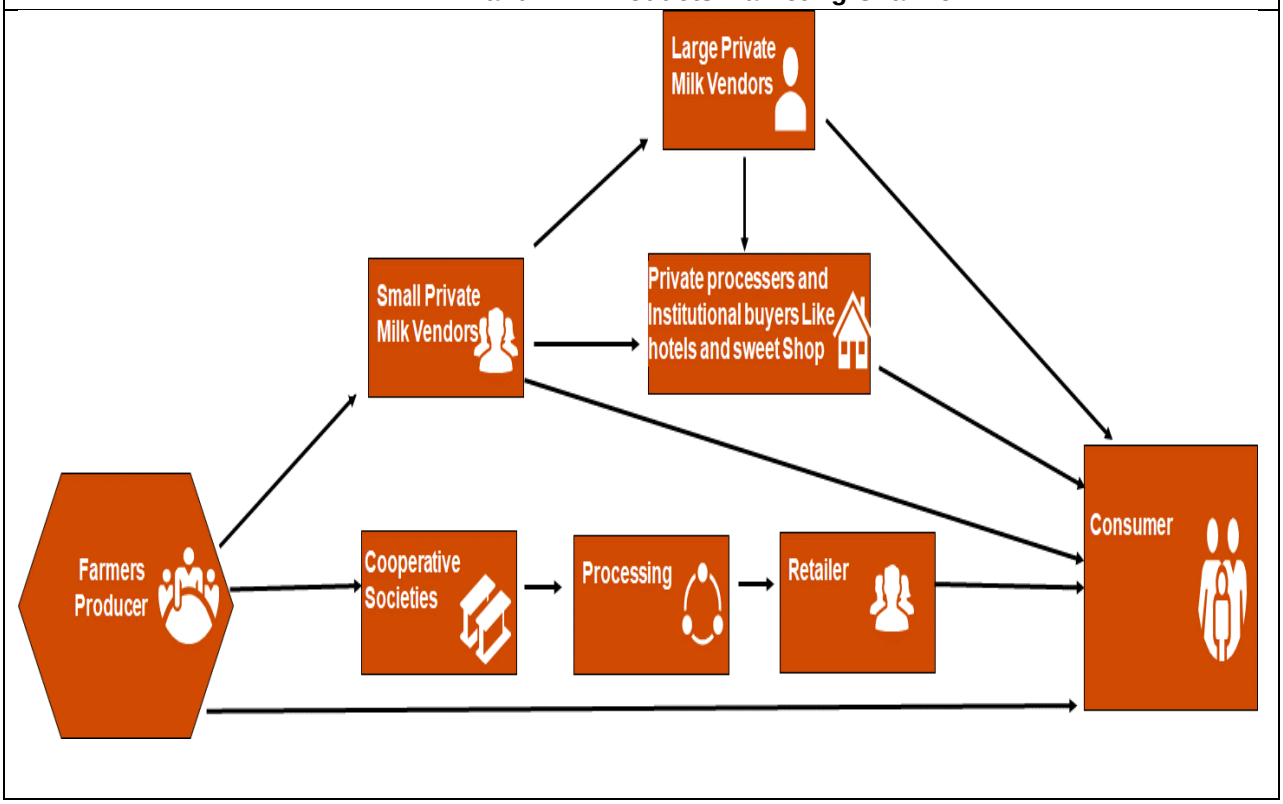
As per estimates, one third of the total milk produced is retained for home consumption and remaining two third of the milk is marketed through different channels. This is significantly higher than the average market surplus(56%) available on national level. Most of the milk is produced by the small and marginal farmers who rear averagely 2-3 animals. These small and marginal farmers find it challenging to access the remunerative market for the sale of produced milk.

Major chunk of the marketable surplus milk in Punjab is procured by unorganized sector, which is largely dominated by small private milk traders, vendors and milkmen. These private players directly procures the milk from the farmers and supply it to consumers and institutional buyers and processers. Most of the procured milk is marketed as pasteurized packed milk or converted into converted into ghee or milk powder. Utilization of milk for high end processing product like butter, cheese, baby food etc. is still very low. As per the prevalent practices, overall milk value chain in districts can be understood by analyzing the three major marketing channel of milk for the producer. Following are the detail about these channels.

Farmers to Private Milk Vendors(Unorganized Market): Major chunk of the marketable surplus milk is procured by the unorganized players comprising small and large vendors. Generally small vendors directly procure the milk from the farmers at village level. The milk procured by vendors can be sold directly to consumer or can be a supplier to large milk vendors. They can also supply the milk to private processers and institutional buyers. Major drawback of this channel is the lack of transparency in weighing and measuring practices, which result in economical loss for the producer. Buffalo milk with 6.0% fat is generally procured at the price of Rs 40-42/litre by these vendors and prevalent cow milk price is in the range of Rs 26-28/litre. Prevalent consumer price for the buffalo milk is Rs 50-52/litre which leaves with a margin of Rs 8-10/litre

Farmers to Cooperative Societies: Around 18% of the total milk is procured through dairy cooperative societies in Punjab[59]. These dairy cooperative societies works on "Anand Pattern" following three tier structure of milk cooperative. The Punjab State Cooperative Milk Producers Federation Limited popularly known as MILKFED Punjab is the largest cooperative which came into existence in 1973. "Verka" is the name of brand under which various products are sold by the MILKFED. Currently there are 8,018 village level dairy cooperative societies,

Milk and Milk Products Marketing Channel



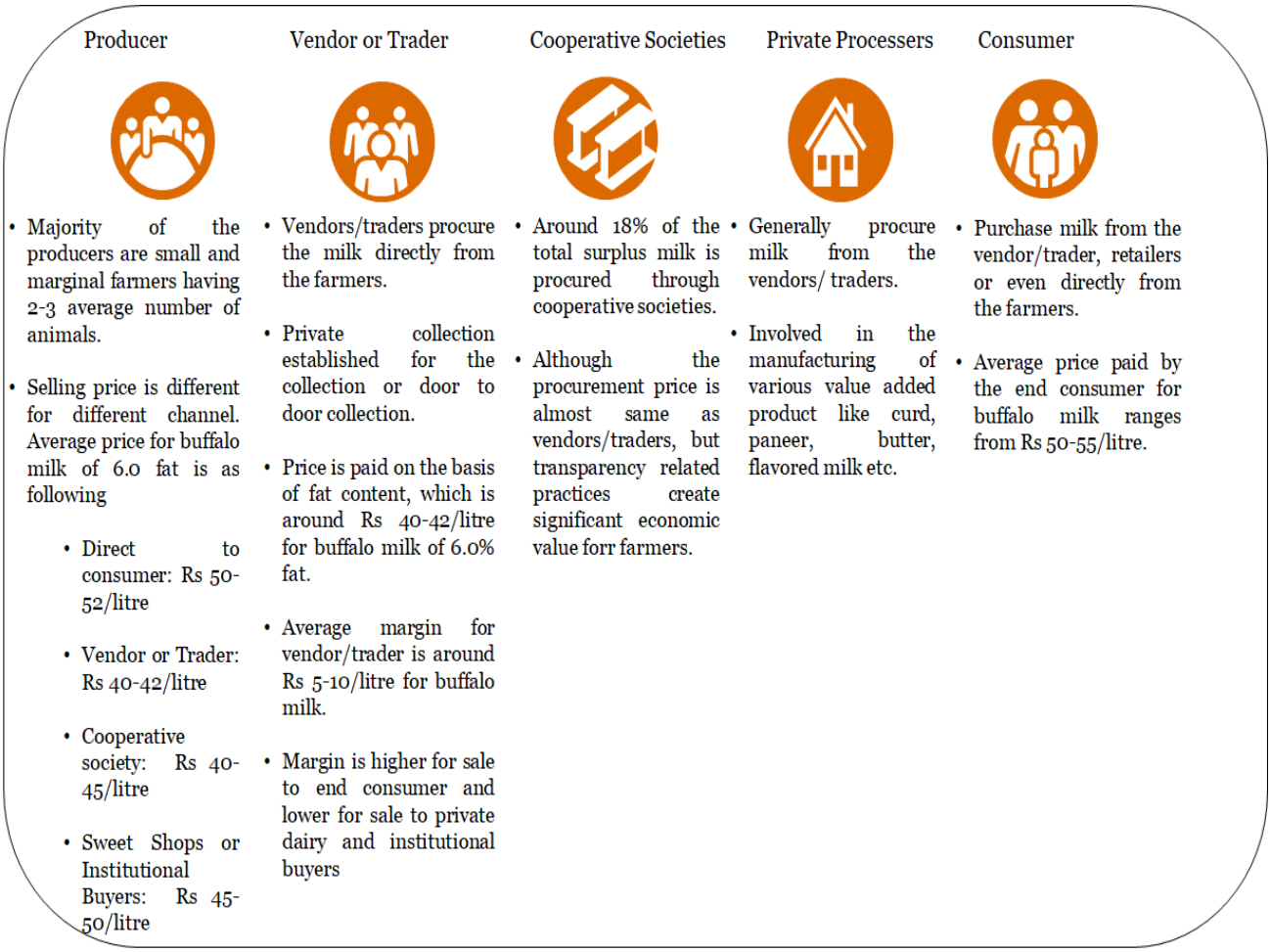
which are attached to 11 district milk producer unions.

Farmers to Consumer: This is the most remunerative channel for the farmer's producer as various intermediaries are not involved in the supply channel. This channel is followed by the farmers living near to big urban centers. These farmers have generally a greater number of animals to leverage the economy of scale and

[59] *Niti Ayog: Report of the Task Force for Agricultural Development in Punjab*

they supply the milk directly to consumers living in urban areas. For example, a large number of farmers living around Chandigarh and Mohali are involved in the direct supply to consumers in Chandigarh market.

Different Value Chain Actors in Districts



4.15.8.8. Production Cost Economics:

The illustrate production cost analysis for buffalo milk per lactation period is given in the table. It has been calculated assuming that average productivity of 1400Litre of milk per lactation period.

Average Milk Production Cost Per Lactation		
Particulars	**Units**	**#**
Cost of Production	**Rs**	
Green Fodder	Rs	15360
Dry Fodder	Rs	12480
Concentrate Feed	Rs	14400
Others(Shed, Electricity, Labor etc.)	Rs	12960
Total Cost	**Rs**	**55200**
Average Milk Production Per Lactation	Litre	1400
Per Litre Average Production Cost	**Rs**	**39.4**

As evident from the table, fodder(green and dry) and concentrate feed constitute the major proportion of the cost of production. One fact which came to the light during primary survey was that the cost for dry fodder has gone

up considerably during recent times. Dry fodder is important to maintain the optimum health level for the milch animals.

4.15.8.9. Major issues faced by the processors and producers

When discussion about milk & milk products, it is important to consider the producers as an important part of the overall processing ecosystem due to their close relationship and role in the processing. From the insights gained from interaction with producers and processors, their overall challenges faced by them can be described as below:

Rising production cost: The cost of milk production is rising continuously which is resulting in lower margins at the end of producers. The major component of the production cost is fodder and feed. Prices for the fodder and feed has risen a higher rate that the procurement price of milk. One important finding in this regard comes from the fact that the price for one bag of feed has increased by 5 times during last 15 years as compared to just2.5-3 times increase in procurement price of milk. Many large dairy farms have closed the operation during last few years in cluster due to economic unviability of production.

Procurement at village level: Although village level dairy cooperative societies exists in the clusters, but still a significant portion of total milk production is procured by the unorganized players. Its results in non-transparency leading to lower final price realization for the producers.

High investment requirement for high-end value-added products: Basic value-added products like paneer, curd, sweets, khoya can be made easily through simple equipment. But sophisticated and expensive machinery is required for high-end value-added products like flavored milk, cheese, which have higher margins. Small processors are unable to invest high capital for the purchase of such machinery.

Marketing of the value-added products: The small processors have their own retail shop in the form sweet shops, where products processed by them are sold directly to customer. Only a limited volume of products can be sold through retail, which means they don't have the much incentive to scale up their operation. Market linkages through collaboration with institutional buyers can help these small processors in cluster to scale up the production operation.

4.15.8.10. SWOT Analysis

As mentioned earlier, milk and milk products has been selected as ODOP for two districts which are Sri Mukthsar Sahib and Mansa . Following is the SWOT analysis for the milk and milk products in these districts.

SWOT Analysis	
Strengths: • High milk yield per animal. • High market surplus of milk after domestic consumption. • Proximity to important urban centres like Chandigarh. • Availability of good medical infrastructure for livestock.	**Weakness:** • High cost of production for milk. • Non availability of grazing land leading to increased expense on fodder. • Limited processing opportunities.

Opportunities:	Threats
• Untapped potential for processing opportunities. • Continues increase in milk production • Enterprising spirit of the people.	• Recent closing of dairy farm due to unviability of business. • Lack of technical know-how for scaling up the processing activities. • Unwillingness of people for taking dairy as occupation due to the risks involved

4.15.8.11. Identified Gap

Various gaps were identified at the firm and cluster level, where work needs to be done in order to increase the scale of activities for ODOP. Following are the major firm level and district level gaps identified through stakeholder consultations.

S. No	Sectors	Gaps	Recommendations
1	Skill training needs	Lack of technical know-how at the end of producer and processors	1. Training and capacity building on milk productivity enhancement with special emphasis on fodder management. 2. Training and capacity building of small processors on processing of high-end value chain product with high margins like flavored milk
2	Manufacturing practices	Difficulty in ensuring hygiene standards and meeting regulatory requirement at the end of processors	Training and capacity building on better manufacturing practices and hygiene & food safety aspect.
3	Technologies	Inability to afford capital intensive machinery for proceeding milk products with high margins	Helping the existing units through individual enterprise support component of the PM FME scheme

Cluster/district level

Infrastructure	Up-gradation proposals
Procurement Structure	Dairy cooperative societies at the village level needs strengthening in order to increase the share of organized milk procurement. Awareness program on cooperative structure can be initiated to develop a sense of high ownership among member farmers.
Bulk Milk Chilling Facilities	Both the districts in the cluster have the two bulk milk chilling facilities, but more such facilities needs to be established in order to ensure geographical accessibility. Such facility can help the processors and producers through extension of shelf life.
Extension services through convergence with other program like NDP	Extension service like AI center, fodder development, testing center to help the producer in productivity enhancement and realizing better price for produced milk.

4.15.8.12. Way Forward: Areas of interventions & suggestions

Dairy sector in Punjab has played an important in the overall prosperity of farmers and making India the number one milk producer in the country. But the sector has been facing lot of challenges on many front over a period of time. . From the detailed discussions with the units, we are proposing various intervention for the development of milk and milk product-based industry in ODOP cluster.

4.15.8.12.1. Strengthening of institutional structure for procurement

Bulk of the organized milk procurement is done through village level cooperative societies. The number of such societies can be increased to increase the accessibility. During interaction with farmers producer, it was observed that they are not very much aware about the cooperative structure and role of village level cooperative societies in it. There seems to be a lack of ownership as impression was that the verka (flagship brand of Milkfed) is procuring the milk. Training and awareness program regarding the institutional structure are need of the hour in order to bring more transparency and increasing the sense of ownership. It was found that the various training programme are conducted through state government's department aimed at productivity enhancement and animal rearing.

4.15.8.12.2. Supporting the group (FPCs/Cooperatives) under group category component

There are district level cooperatives dairy working in the state under cooperative structure. Other than cooperatives, producer companies are also operational in dairy sector. Bani milk producer company limited is one the prominent FPC working in the milk procurement and processing. Such collectives can be supported under the group category component of the scheme to help them avail the credit linked capital subsidy for upgradation of their existing structure.

4.15.8.12.3. Support in upgradation through the individual enterprise subsidy component

The small processors finds it difficult to invest high capital for the purchase of expensive and sophisticated machinery for processing high end value chain products The PM FME scheme has the component of individual application, where the processors can be provided with the benefit of credit linked subsidy to help them in upgradation of their units. The units in the district should be encouraged to take the benefits under the individual component of the scheme through awareness creation.

4.15.8.12.4. Training and capacity building of the producer & processors under the scheme

The rising cost of milk production has left the producers with very thin margins. It has resulted in many of the producers leaving the dairy profession due to unviability. Producers can be provided with training and capacity building support to start the basic processing activities which can help them with better price realization. Existing processors can be provided training and capacity building support in order to help them in upgradation of their structure.

4.15.8.12.5. Better convergence with dairy development scheme

There are many state and central government schemes currently running which are aimed at development of dairy sector. One of the prominent such scheme is national dairy plan phase 2, which is aimed at development and strengthening of milk processing infrastructure. Convergence with such scheme can help in ensuring the better reach of the program ultimately helping the producers in realizing better price for their produced milk.

4.16. Firozpur

4.16.1. Socio economic profile

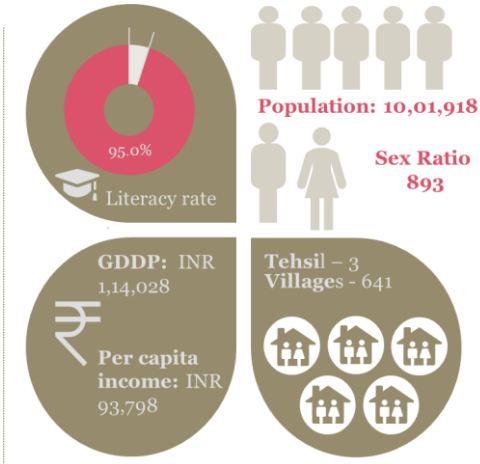
Firozpur district is located on the East of the state. On the North-East, the river Satluj separates it from Jalandhar and Kapurthala districts. The united stream of river Satluj and river Beas separates it from district Tarn Taran in the North-West and farther down from Pakistan.

Headquarters of the district is located at Firozpur town, the district has three talukas namely, Firozpur, Zira and Guru Har Sahai and 6 blocks name as, Firozpur, Ghall Khurd, Guru Har Sahai, Mamdot, Zira and Makhu.

According to the 2011 census, the district has 641 villages. Gross District Domestic Product (GDDP) and per capita income during 2015-16, at current prices, was much below than the state average.

4.16.2. Demographic profile

According to the 2011 census, Firozpur district has a population of 10,01,918 of which male and female population were 52.86% and 47.14% respectively. Out of the total population of the district, 71.53 % is rural and 28.47 % is urban. The district has a sex ratio of 893 females per 1000 males and a literacy rate of 95%.



4.16.3. Climate and Rainfall

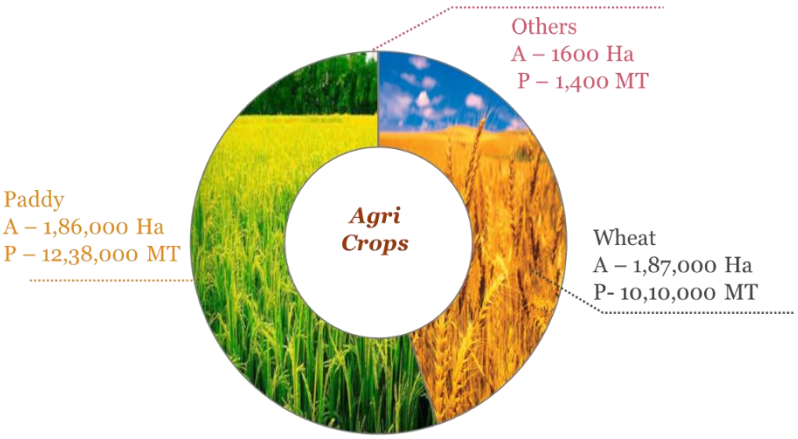
The climate of the district can be classified as tropical desert, arid and hot. The climate on the whole is dry and characterized by very hot summer. June is generally the hottest month and on individual days, the maximum temperature may be about 47^0C. January, happens to be the coldest month when the minimum temperature occasionally drops to freezing point of water. The area receives about 389 mm annual normal rainfalls.

4.16.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is 91%. The district has the cropping intensity of 184%. Wheat and paddy are the main Rabi and kharif crops of the district. The district also grows kharif pulses and oil seed crops of Kharif and Rabi season in small quantity.

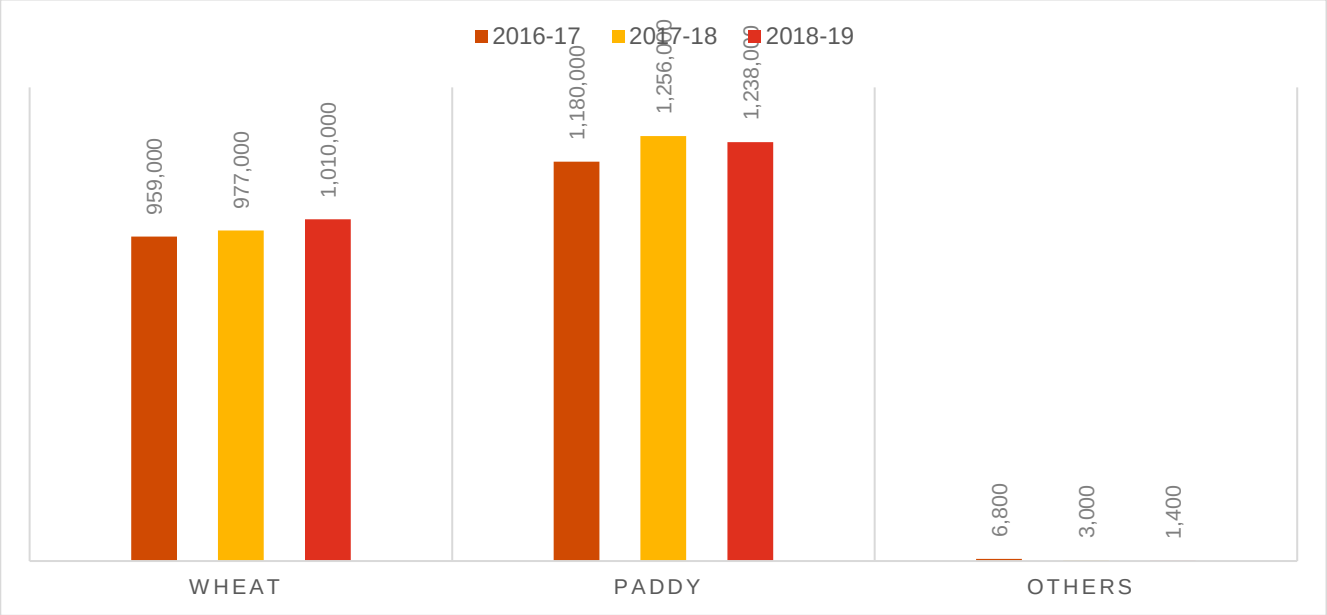
Production trends-Agricultural crops

Production field crops has increased year on year in the district.



Graph 122: Major Field crops grown in district Firozpur (2018-19)

Source: Department of Agriculture, Govt. of Punjab



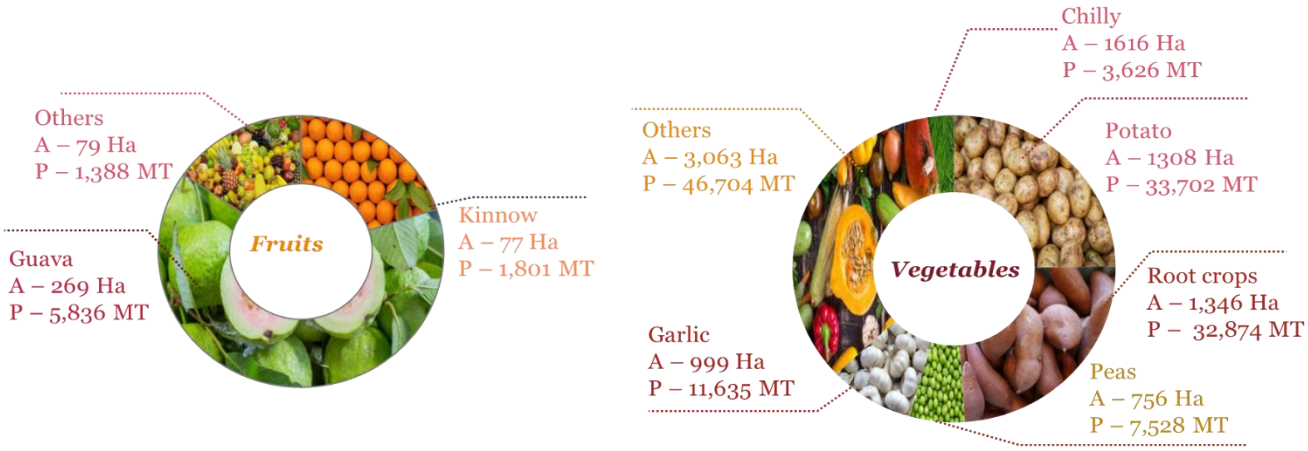
Graph 123: Production trend of agricultural crops in Firozpur district

Source: Department of Agriculture, Govt. of Punjab

4.16.5. Horticulture profile

The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc. and that too unlimited quantity. Overall, there is cumulative growth of 118% in the area under vegetables in last four years (from 2016-17 to 2019-20).

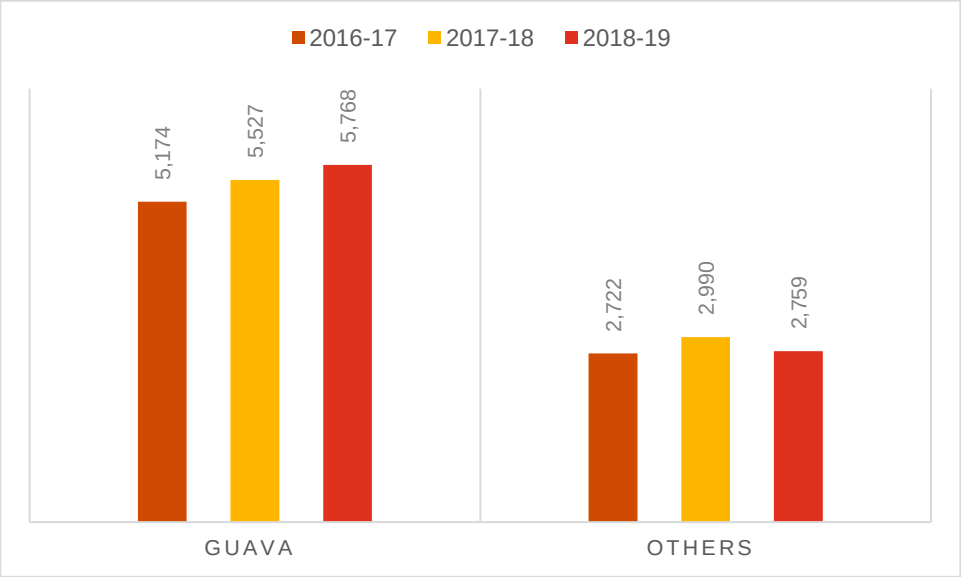
Out of all vegetables, maximum area is under chillies which recorded a cumulative growth of 126% from 2016-17 to 2018-19. The district produces a wide variety of fruits like kinnow, guava and ber and that too in limited quantity. The district reported a cumulative growth of above 14% in area under all fruit crops taken together in last four years from 2016-17 to 2019-20



Graph 124: Major fruits and vegetables grown in the district Firozpur (2019-20)

Production trend-vegetables

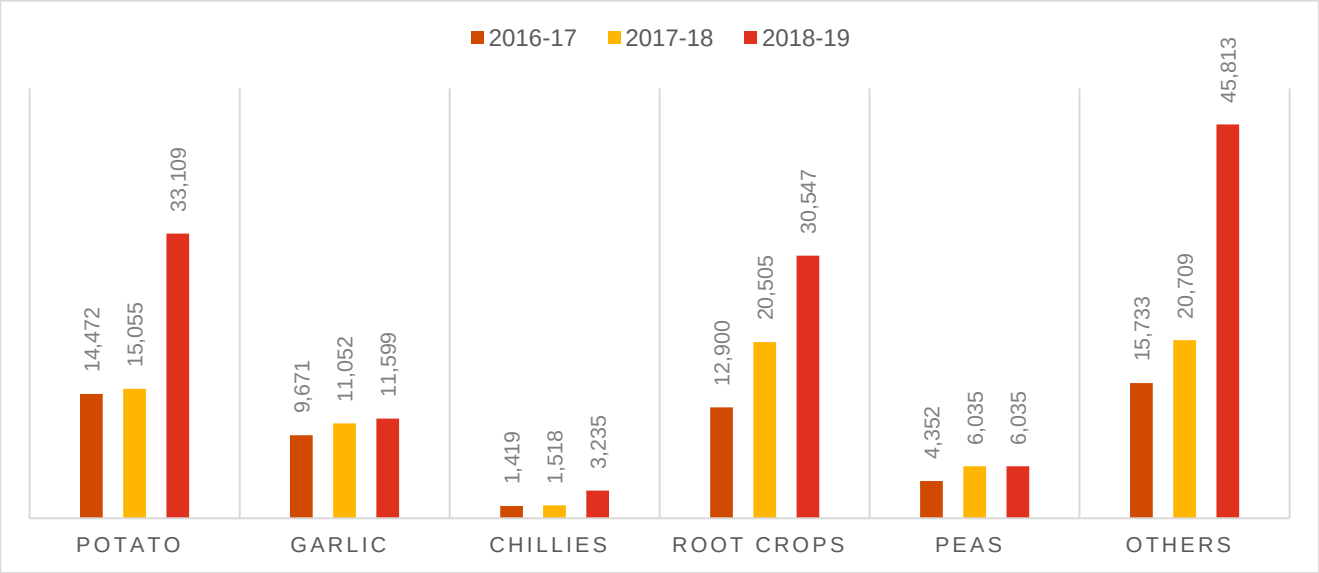
Guava production has increased year on year in the district.



Graph 125: Production trend of fruits in Firozpur district (MT)

Production trend-vegetables

Most of the vegetables has shown increasing trend over last three years in the district.

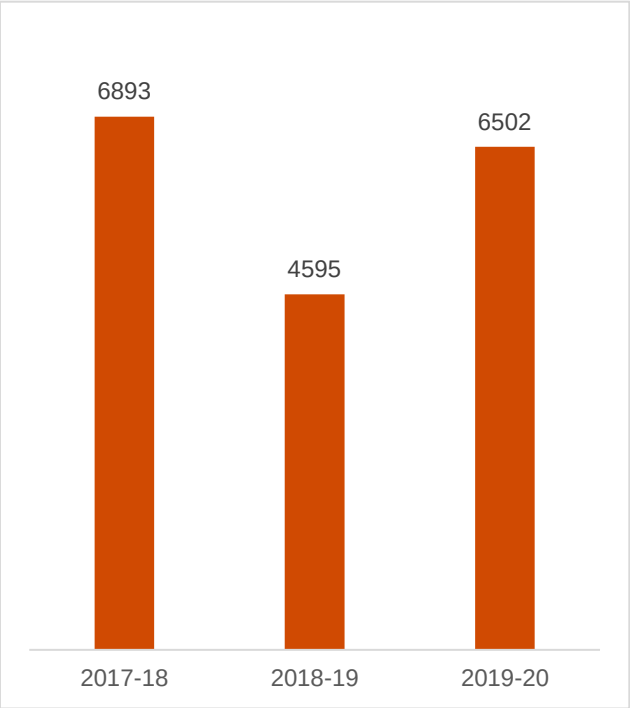


Graph 126: Production trend of vegetable crops in Firozpur district (MT)

4.16.6. Allied activities profile

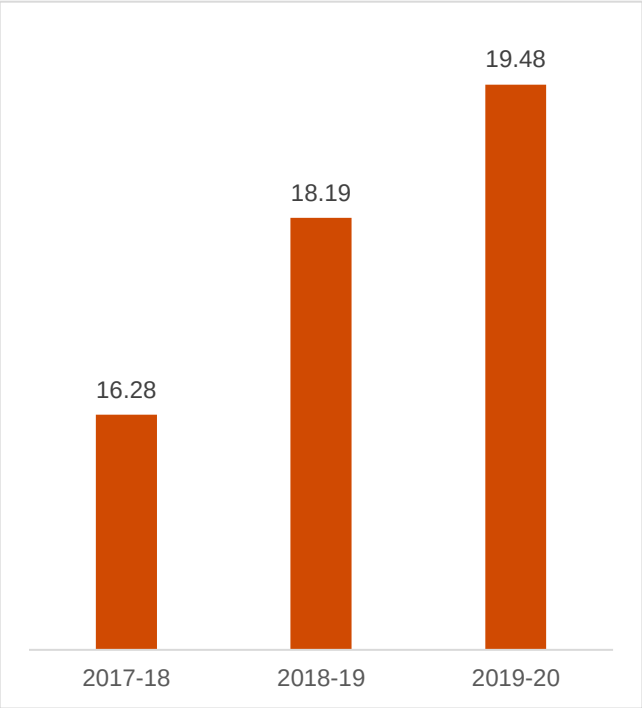
Production trends – Fish

The production of fish in the district varied between 4,500 MT to 7,000 MT in past three years. Production dropped in 2018-19 and again it rose in 2019-20 equivalent to 2017-18. The major varieties being cultivated include katla, rohu, marak and exotic varieties like silver carc, grass carc, common carc etc.



Graph 5: Production trends of Fish in Firozpur (MT)

Source: Fisheries Department, Punjab



Graph 6: Production trends of Milk in Firozpur (LLPD)

Source: Directorate of Dairy Development, Punjab

Production trends-Milk

The district produces about 19.5 lac liter /day of milk. There is no organized milk processing plant in Firozpur district. There are more than 500 dairy farms in the district which are which process milk at small scale to manufacture paneer, curd, lassi, butter, cream, khoya etc. Milkfed, Nestle and Banni have installed chilling centers in the district, from where milk is transported to nearest milk processing plant. Milkfed itself has 5 chilling centers which procures 1.32 LLPD of milks from 1,004 villages.

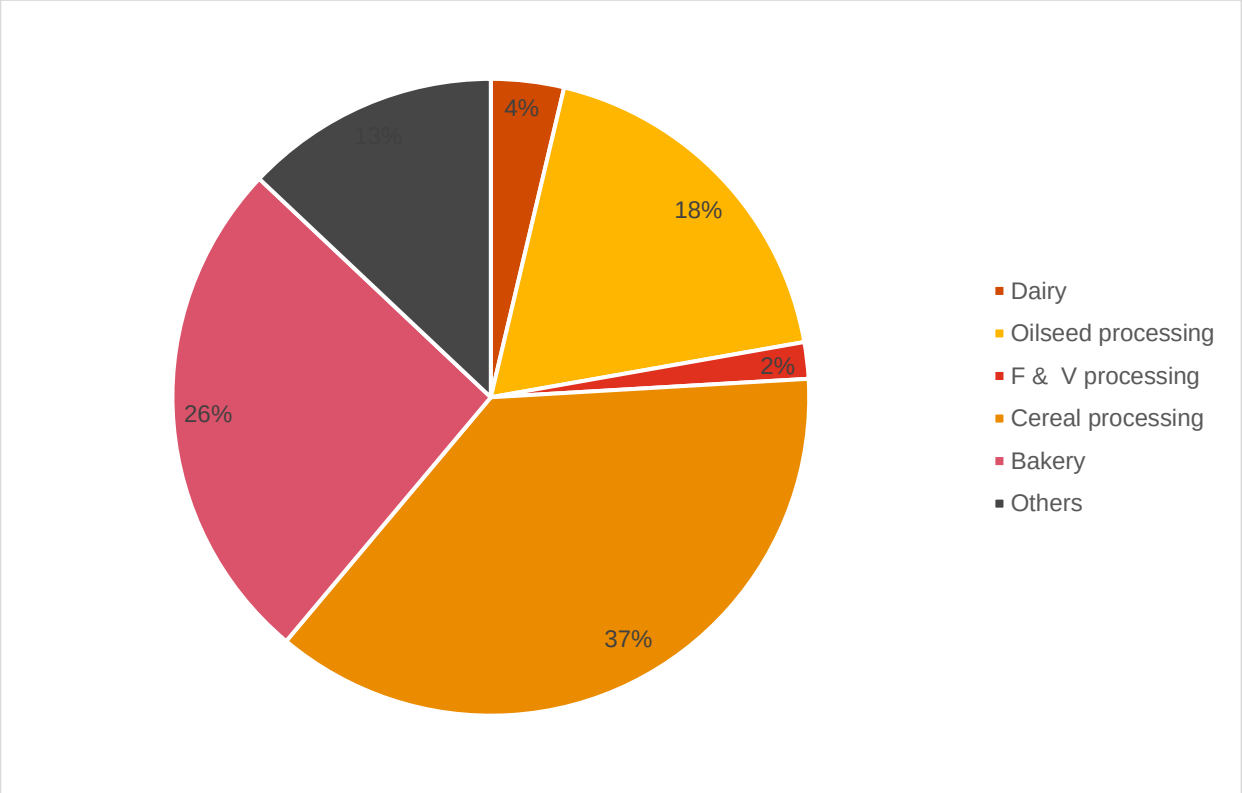
4.16.7. Industrial profile

There were 2252 registered Micro Small enterprises in the district and 6 registered medium and large enterprises providing employment to 7,275 and 317 persons respectively, as per FY 2014-15.

Table 18: Industry in Mansa

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	2252
2	Registered Medium & Large Units	No.	6
3	Employment in MSE Sector	No.	7275
4	Employment in Large and Medium Industries	No.	317
5	No. of Industrial Areas	No.	1
6	Turnover of MSE Sector	Rs. Lakh	59800
7	Turnover of Large & Medium Sector	Rs. Lakh	21269

Source: District Industries Centre, Firozpur



Graph 127: Spread of micro food enterprises in the Firozpur district

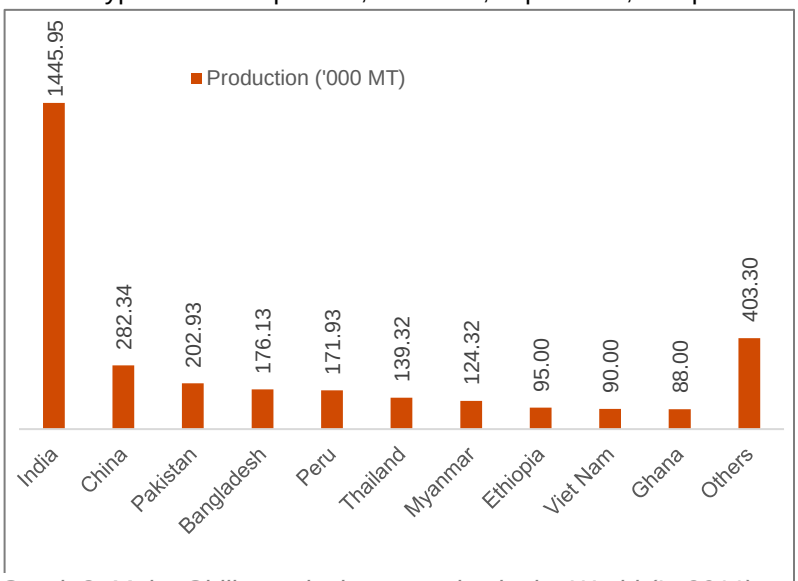
Source: Primary Survey

Adani Wilmar has a rice manufacturing plant with an installed capacity of 15 MTPH. There were about 300 wheat flour mills in the district out of which 10-12 are mini semi-automatic types, and more than 90 rice mills of average capacity of 2 MT/hr. there are a couple of medium sized state-of-the-art basmati processing mills, exporting quality rice to overseas markets.

There is no major unit in the district processing fruits and vegetable. However, there are number of individuals/micro enterprises, FPOs/SHGs etc. manufacturing and marketing products like honey, pickles etc. There is no milk processing plant in the organized sector in the district. However, there are chilling centers by Milkfed, Nestle and Banni. Milkfed has 5 chilling centres which procures 1.32 LLPD of milks from 1004 villages. The district also has over 200 bakery units.

4.16.8. ODOP: Chillies

Chilly has been selected as ODOP of the Firozpur district. It is used as vegetable as well as a spice. it is gaining importance in the global market because of its byproducts like powder, oleoresin, capsanthin, chili paste and chili oil. Capsaicin, chili oil, powder and oleoresin are used to impart pungency. Capsaicin has many medicinal properties, especially as an anti-cancerous agent and instant pain reliever. Chilly has long been used for pain relief as they are known to inhibit pain messengers; extracts of chili peppers are used for alleviating the pain of arthritis, headaches, burns and neuralgia.



Graph 8: Major Chilly producing countries in the World (In 2011)

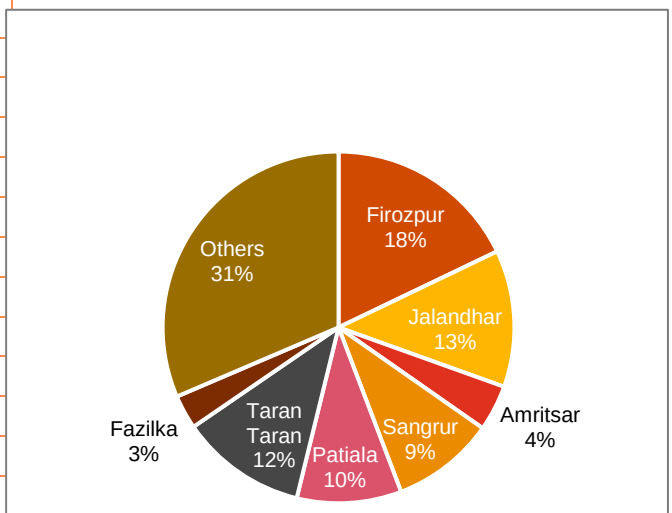
Source: FAO statistics

Chilly is the most common spice cultivated in India. India contributes about 36% to the total worlds' production. It is Grown almost all over the country. In the year 2018-19, India's annual Chili production was about 14.45 lakh MT, China had 2.82 lakh MT and Pakistan had production of 2.02 lakh MT. India is not only the largest producer but also the largest consumer of chilies in the world. India is also major exporter of chilies to different countries. China, Malaysia, Thailand, USA, and UAE are among the leading importers of Chilly from India.

In 2017-18, Karnataka and Madhya Pradesh were the largest producer of Chilli (Green) in India and contributes 18%, each to the total production of Chilli, followed by Bihar (12%), Andhra Pradesh (12%), Maharashtra (10%), and other states contributing 28% to the total production under Chilly. Punjab ranks 15 in production and contribute only 0.5% of the total production in India (2017-18).

States	Area ('000 Ha)	Production ('000 MT)
Karnataka	45.91	673.81
Madhya Pradesh	41.29	669.16
Bihar	42.91	451.19
Andhra Pradesh	19.34	434.89
Maharashtra	30.59	342.48
Jharkhand	14.55	253.3
Chhattisgarh	28.87	222.1
Telangana	11.1	181.66
Haryana	19.02	133.84
Uttar Pradesh	29.47	71.63
Nagaland	5.98	44.5
Tamil Nadu	2.08	27.14
Tripura	2.49	19.49
Jammu	2.15	15.76
Punjab	8.21	15.54
Himachal Pradesh	1.22	14.53
Others	3.45	21.17
Total	**308.63**	**3592.17**

Chilly production in Punjab occupied an area of 9,524 hectares with a production of 18,087 tonnes in the year 2018-19. Firozpur district has highest area under Chilly production with 1,616 hectares and production of 3,626 tonnes in the year 2019-20, it is followed by Jalandhar district.



Graph 9: Major chilly producing districts in states in year (2018-19)

Source: Department of horticulture, Punjab Govt

Chilly is highly perishable in nature. It requires more attention during harvest, storage, and transportation. Through value addition, the market price, shelf life and the quality of the produce can be enhanced.

4.16.8.1. Clusters of Chilly in Firozpur district

In Firozpur district, out of all the vegetables, the maximum area is under chilies, which recorded a cumulative growth of 126% from 754 Hectare (1,419 MT) in 2016-17 to 1,706 Hectare (3,235 MT) in 2018-19. In 2017-18, district was at the fourth rank in the area and production of chilies, behind the Jalandhar, Patiala, and Sangrur. In 2018-19, Firozpur became the largest producer of chilies in the state, which shown high potential of production and processing of chilly.

There are three major clusters of chilly production in Firozpur district: -

1. Guru Har Sahai
2. Makhu
3. Zira

These clusters have mandis and storage godown for chilly, which are managed and operated by APMC committee and CH-1 and Sanauri are the major varieties grown and traded in the district. Chilly is produced in Rabi as well as Kharif crop. Seasonal table of chilly production is shown in below:

Table 2: State wise area and production of Chilly (Green) (2017-18)
Source: Horticulture statistics at a glance, 2018

Season	Month of Sowing	Month of Transplanting	Month of harvesting
Kharif	May-June	July-August	October-November
Rabi	November-December	December-January	May-June

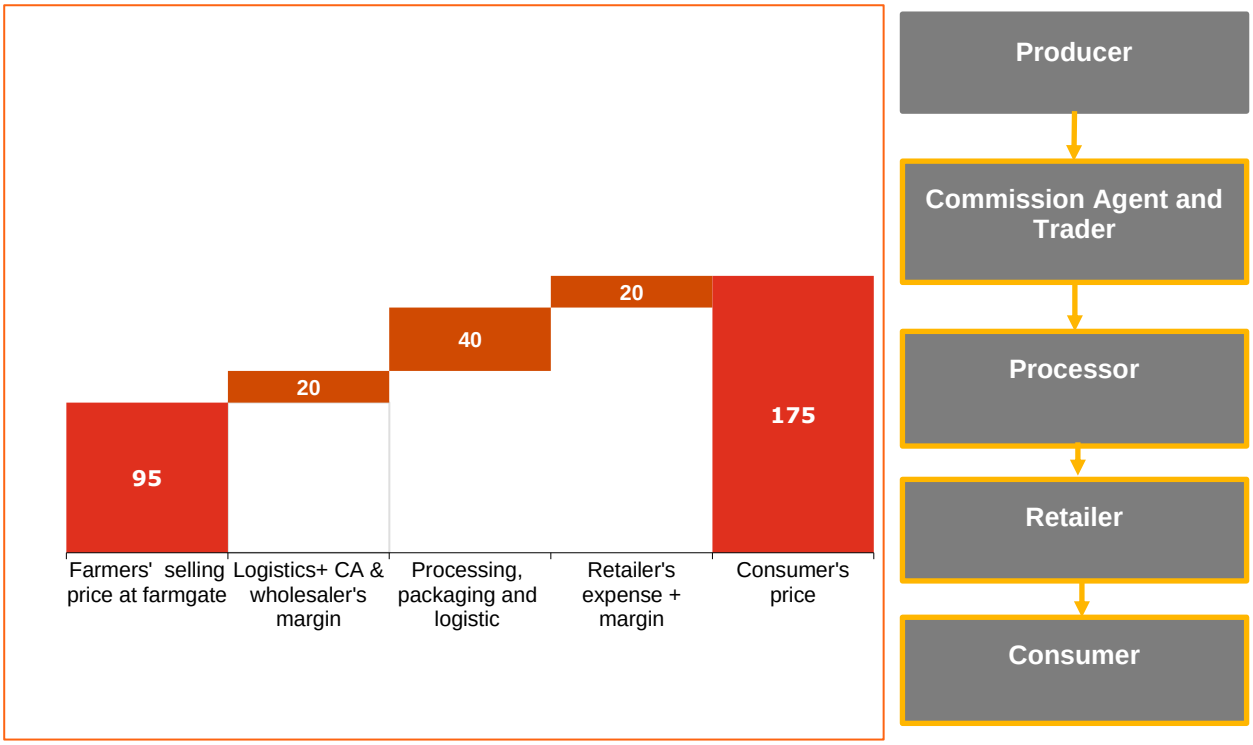
Most products manufactured form green chilly are chilly pickle, chilly paste, chilly sauce etc. Product from red chilly is powder which is used as spice. There are small scale chilly grinding mills in district which are also used for grinding of turmeric, coriander, and other spices to convert into powder. The powder is sold in packaged as well as loose form. People use these units for grinding of red chilly for their household purpose too.

4.16.8.2. Insights about the industry and sector

There are no commercial units in the Firozpur district for manufacturing of chilly sauce, paste or pickle etc. Most of the produced chilly is sold in the local market Aggregators, rural haats, and direct sales to commission agents are the dominant primary sales channels for chilly farmers almost half of the chilly produced in the state is consumed domestically and rest is sent to New Delhi, Himachal Pradesh, Jammu & Kashmir, and North Eastern states.

3. Value chain of chilly

There are different players involved in the chilly value chain. Farmer sale chilly at Rs 95 per Kg from farmgate and it reaches to Rs 175 at consumers' end, thus farmers get around 50% share of the consumers' rupee. Existing marketing channels and value chain diagram of chilly in the district is shown below:



Graph 10: Value chain and supply chain of red chilly in the district. ***(value In Rs per Kg)***

4. Challenges in the chilly value chain

Most of the produced chilly is sold in the harvesting season itself due to non-availability of better storage facilities. It creates glut in the market and distress sale of the produce takes place. There are high post-harvest losses in the supply chain due to improper handling, transportation, and poor post-harvest management; and very limited produce is processed into value added products. Major challenges in the chilly value chain in the district are:

j) Unavailability of processing Infrastructure

Major infrastructure required for production of chilly viz. include soil testing lab, Agri-clinic, disease forecasting unit, plant health clinic, storage, packaging house etc. are available in the district.

Firozpur district have very, small-scale pulverizing units and there is no processing infrastructure available for chilly value addition except chilly powder, other processed products such as dehydrated chili, pickle, powder, paste, sauce, etc., can be prepared from chili. Farmers are selling the produce through tradition marketing channel and they prefer to sell just after picking from farm in green or red form. Even the primary processing i.e., drying of chilly is done in non-technical manner. Chilly drying is done in open sun which deteriorates the quality of produce.

To improve the quality of produce pre-processing infrastructure like drying facility and other processing infrastructure need to be developed. Farmers can get better return if they will sell it to processing units directly.

k) Lack of skilled human resource

There is lack of skilled human resource in the district. Mostly farm laborer from Uttar Pradesh and Bihar are engaged in the farming related activities. Local labors are also available and involved in daily wage basis.

Human resource involved are mostly unskilled for value addition related process. For processing and value addition of chilly there is need of skill improvement of the manpower and it is not available in the district.

l) Unavailability of testing facilities for value added product

Soil testing labs are prevailing the district, many farmers are availing service of soil testing labs and they find it very useful, but testing facility for value added products like paste, powder etc. is not available and there is need to develop these facilities.

m) Lack of Institutional support

To source the saplings, farmers rely on private players. Horticulture department promoting entrepreneurs for nursery establishment. Department is supporting expansion of CH-1 variety of chilly, which is high yielding variety. For the supply of fertilizers most farmers rely on input dealer and it as obvious and inevitable for the farmers.

The cooperatives and govt agencies showed the lack of penetration in distributing primary input such as fertilizer etc. There is need of development of community-based institutions. Cooperatives, government agencies must go to bottom-up approach frame their policy instrument by involving cooperative societies in the policy process.

n) Issues in credit linkage

Credit is an essential input in agriculture that has multiple effects on production and farm income. Lack of information on credit product and small scale of operation found to be major limiting factor in accessing the credit. Many farmers and entrepreneurs are not able to get credit facility to establish processing unit because of non-availability of asset for mortgage.

4.16.8.3. Suggested intervention and vision

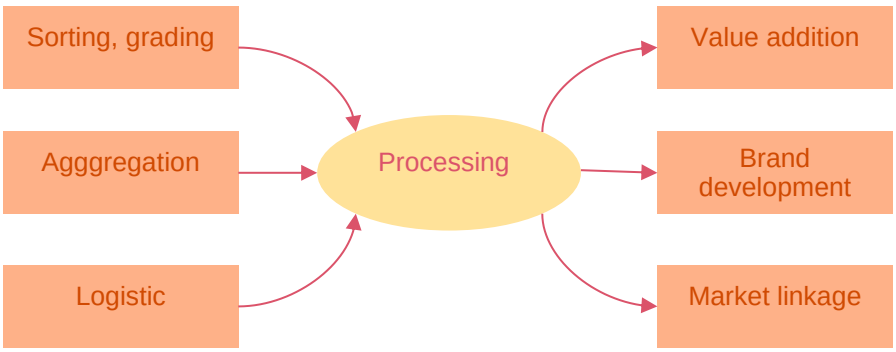
The processing of chilly into to various value-added products can minimize the post-harvest losses and offers huge scope for entrepreneurship development at micro, small or medium scale levels using effective government schemes such as PM-Formalization of Micro Food Processing Enterprises Scheme.

Setting enterprises for processing of chilly can help in better price realization to chilly growing farmers, which in turn will help farmers to get motivated and there will be expansion in chilly production area. Chilly processing will help in fetching export market and it will help in reduction of income inequality among farmers.

There is need of development of processing infrastructure in the district, it will also help in generation of employment opportunity in the region. The community-based institution can be established at ground, which can work for establishing processing units, market and developing skill, capacity building of farmers for processing of chilly. Chilly processing can help district in developing it as important ODOP of the district, SWOT analysis for this is shown in the table.

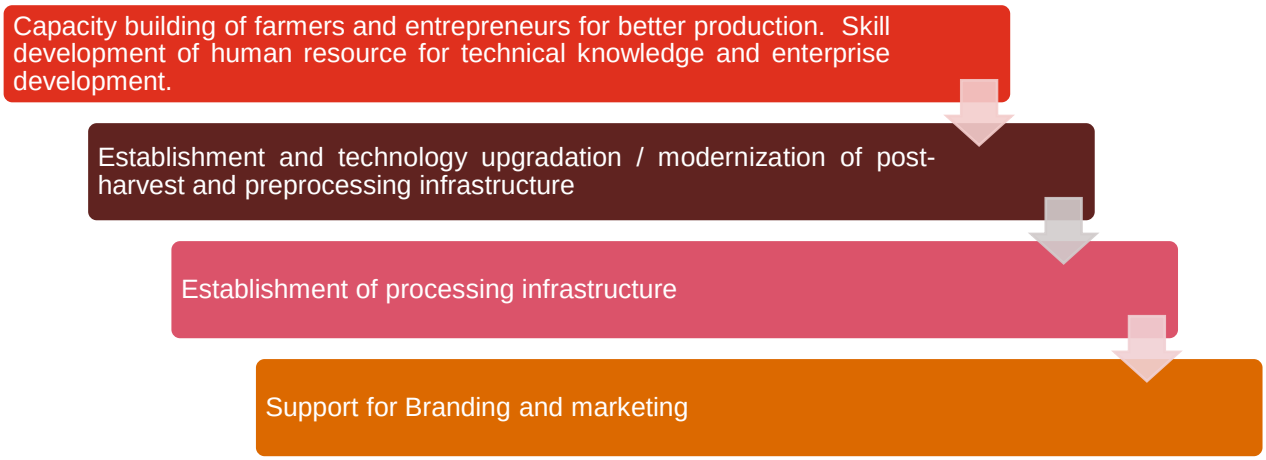
SWOT analysis for chilly processing	
Strengths: • Significant increase in the area under cultivation for chilly in the district. • Large consumption base.	**Weakness:** • High fluctuation in the prices especially during glut season. • Increasing production cost due to input.
Opportunities: • Opportunities for processing to manufacture value added products. • Collectivization of farmers to form the collectives institute for distance marketing.	**Threats:** • Lack of transparency in the marketing system. • Large number of intermediaries involved in the marketing channel resulting in low margin for the producer.

Suggested model



There are many products which can be formed by processing of chilly such as dehydrated chilly, pickle, powder, paste, sauce, etc. and pungent types of chilies can be used by the pharmaceutical industry in the preparation of stimulant and counter irritant balms and in stomach-ache, carminative, and stimulant formulation etc.

Intervention required for chilly processing need to focus on all the aspects of post-harvest management which include sorting, grading, logistic, processing to value added products and finally branding and market linkage of the processed products. Based on the existing challenges and prevailing conditions in the district, following interventions are required: -



Suggested interventions for overcoming the challenges of existing of value chain are shown below:

#	Particular	Interventions
1	Skill training needs	Agriculture universities, local level government institutions, KVKs can focus on skill and capacity building of the human resource and farmers.
2	Manufacturing practices	There is huge scope of export for chilly sauce, chilly paste, and powder of chili. Processing and storage units should be established in blocks of Firozpur district, which will help in participation of farmers in value addition.
3	Technologies	There is an urgent need for the establishment of primary drying units, Pulverizing units and paste, sauce making units for better processing
4	Access to finance	Care need be taken by lending agencies to reduce the transaction cost by giving appropriate credit, removal of intermediaries and introduction of paperless loans that reduce both cost and energy.

5	Community based institution building	Since the region has strong farmer cooperatives, government agencies must go to bottom-up approach frame their policy instrument by involving cooperative societies in the policy process. Horticulture department should work for strengthening of the cooperative societies so that production area of chilly can be increase in the district and processing and value addition can be strengthened.

Table 3: Suggested interventions for chilly processing

4.16.8.4. Pre-processing and post-harvest management

Infrastructure for pre-processing and post-harvest management need to be development. The better-quality product get higher price and it help high standard end value added product.

i) Development of drying infrastructure

To get better product, drying should be done in hygienic condition the well dried and cleaned produce fetches a premium price.

j) **Sorting-grading facilities and skill development**

The chilies are graded mostly on the basis of color and size. Grading that is to be done at producer end for sorting of discolored, white and spoiled chilies at the time of its drying in order to get premium price. Commercially, there are various grades, such as the first sort, the second sort, mixture, etc. Grades, such as special, medium and fair are also adopted. Good fruit length, shining red color, high pungency and strong attachment of the calyx are the important factors.

The grading is generally followed on the following parameters:

a) Seed and fruit (pod) ratio
b) Seed size and hardness
c) Thickness of skin of pods
d) Pungency

There are several local and conventional grades followed by farmers, village merchants and itinerant merchants such as the visual assessment of grades by seeing the lots/heaps and by picking hand full of pods and analyzing them.

Improved drying system are not practiced which results in non-uniform color and thus do not possess proper quality parameters. Training and infrastructure need to be established for modern sorting and grading facilities.

Suggested intervention

Particulars	Gaps/ Problems	Suggested Interventions	Intervention Agencies	Actions under PMFME
Production	• Declining trend in cultivation of chili • Crop loss due to disease/pest outbreak like whitefly	• Cultivation at commercial scale • Engaging FPOs in production, processing and marketing • Capacity building of farmers	• Individual entrepreneurs • Farmers • Farmer Producer Companies • SRLM • Private Players • PAU	• Training under PMFME
Processing units	• No or few value-added products	• Individual micro enterprises	• Individual entrepreneurs • Farmers	• Assistance in availing benefits of

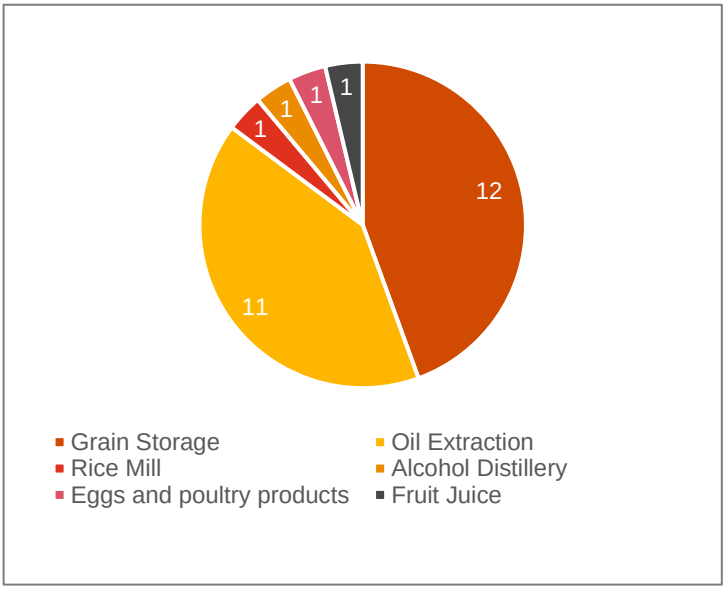
	manufacturing units of chili	may be set-up for chili-based value-added products • Common Incubation Facility for chili-based products may be set up	• SHGs • Farmer Producer Companies • Existing Food Processing Units • KVKs • Private Institutions	PMFME Scheme
Capacity Building	• Processing based skills of farmers is lacking • Entrepreneurship Skill is also lacking • No awareness about GMP, GHP, licensing, statutory clearances	• Development of customized training curriculum • Organising beneficiary training	• State Level Technical Institution • NIFTEM • DRPs	• Training Fund under PMFME Scheme
Marketing & Branding	• No concrete knowledge on market enhancement and processes/ techniques to follow • No big buyers are present • Packaging not been focused • Mostly local market covered	• Development of marketing and branding plan/ reports • Organising buyer-seller meet • Development of packhouses with modern packaging facilities • Promoting the chili of Firozpur for large scale marketing	• SPMU • SLTI • Farmers/ Investors/ SRLM	• Availing benefits of marketing and branding funds under scheme

4.16.9. Non ODOP products in the district

4.16.9.1. processing industry of Non-ODOP products in district

Study is conducted for 27 food processing units in the Firozpur district. Out of these units 45% are involved in value addition of grain and other Agri products by providing storage facilities, 40% of the units are involved in oil extraction and total capacity of these plants is approx. 900 MT / day. Other units involved paddy processing (rice mill), fruit juice, alcohol distillery and poultry products.

The oil extraction units are involved in extraction of oil from rice bran, mustard, cotton seed and soyabean etc.



Graph 13: Food processing units of Non- ODOP products in Firozpur

Source: FSSAI, analysis PwC

4.17. Kapurthala

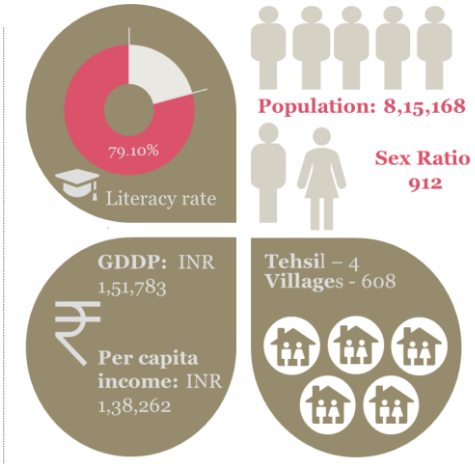
4.17.1. Socio economic profile

Kapurthala District is divided into two noncontiguous parts about 32 km apart-Kapurthala and Sultanpur Lodhi tehsils forming one part and the Phagwara tehsil the other. Districts bounded partly in the North and wholly in the West by the river Beas which separates it in the North from district Gurdaspur and in the West from district Amritsar. District Kapurthala lies between the rivers Satluj and the Beas and is known as Bist Doab.
Headquarters of the district is located at Kapurthala town, the district has four tehsils namely, Kapurthala, Sultanpur Lodhi, Bholath and Phagwara. The district has 5 blocks namely, Kapurthala, Nadala, Sultanpur Lodhi, Dhilwan and Phagwara. The district has 608 villages.

The district Gross District Domestic Product (GDDP) and per capita income during 2015-16, at current prices, was much above than the state average.

4.17.2. Demographic profile

According to the 2011 census, Kapurthala district has a population of 8,15,168 of which male and female population were 52.29% and 47.71% respectively. Out of the total population of the district, 65.3 % is rural and 34.7 % is urban. The district has recorded a decadal growth rate of 8% which is lower than that of state average. Among the districts it ranks 14th in population size. The district has a sex ratio of 912 females per 1000 males and a literacy rate of 79.1%.

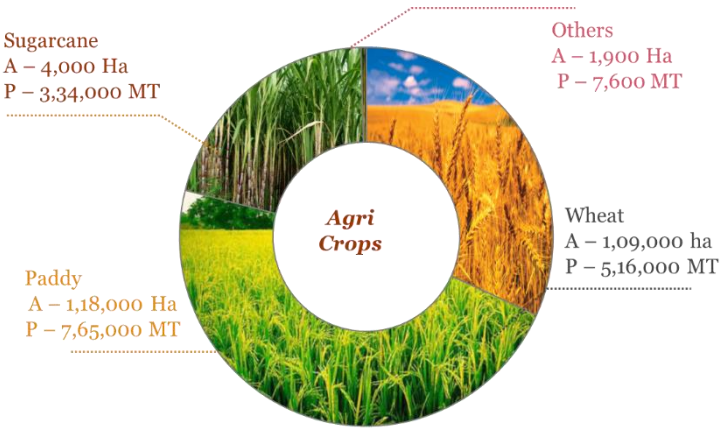


4.17.3. Climate and Rainfall

The climate of the district is characterized by general dryness except for a short period during south-west monsoon season. During cold season, a series of western disturbances affect the climate of the district. During the summer months i.e., from April to June, weather is very hot, dry and uncomfortable. The weather becomes humid and cloudy during July to September due to penetration of moist air of oceanic origin into the atmosphere. The normal annual rainfall of the district is 779 mm.

4.17.4. Agriculture profile

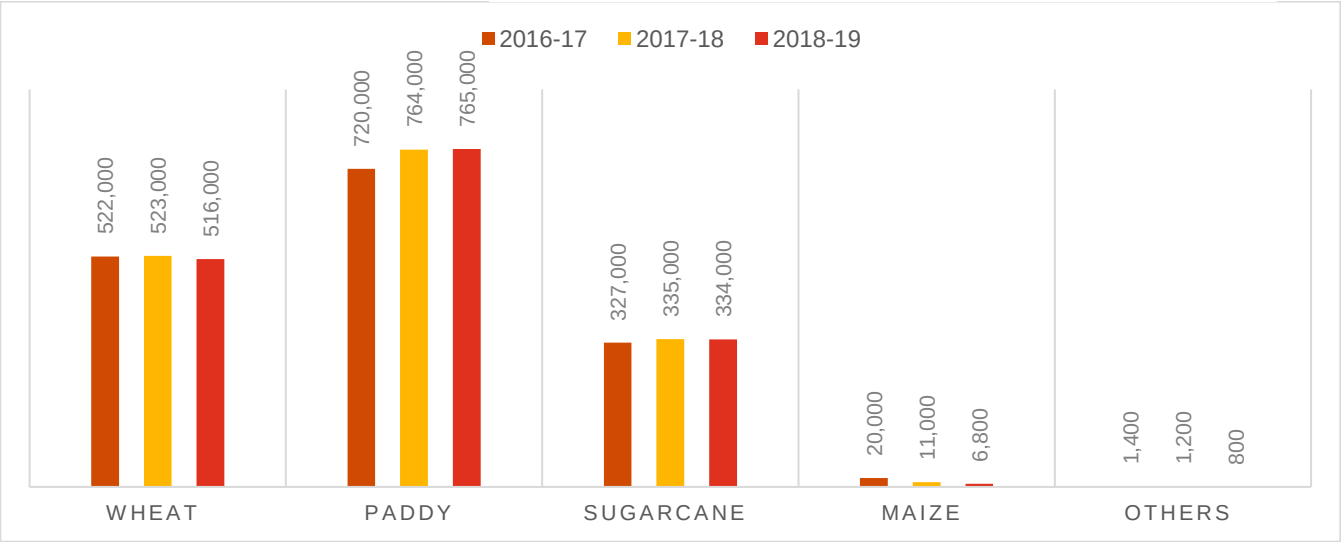
Out of the total geographical area of the district, the net sown area is 80%. The district has the cropping intensity of 206%. Wheat and paddy are the main Rabi and kharif crops of the district. The other major crops of the district include maize and sugarcane. The district also grows rabi oilseed (sarson) in small quantity.



Production of paddy has increased in last three years however production of wheat and sugarcane has seen a decreasing trend in the same duration.

Graph 128: Major Field crops grown in district Kapurthala (2018-19)

Source: Department of Agriculture, Govt. of Punjab

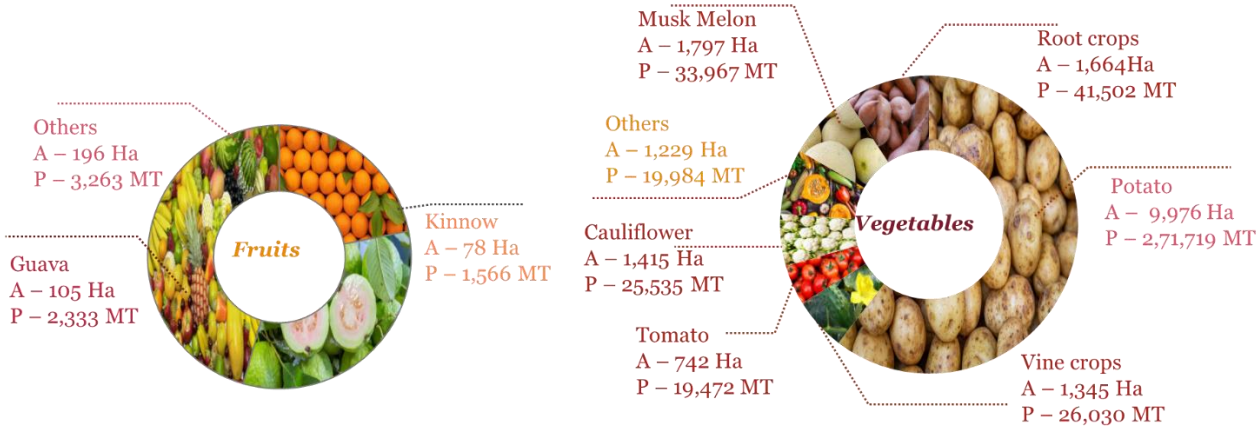


Graph 129: Production trend of agricultural crops in Kapurthala district (MT)

Source: Department of Agriculture, Govt. of Punjab

4.17.5. Horticulture profile

The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc. and that too substantial quantities. Overall, there is cumulative growth of over 7% in the area under vegetables in last four years (from 2016-17 to 2019-20).

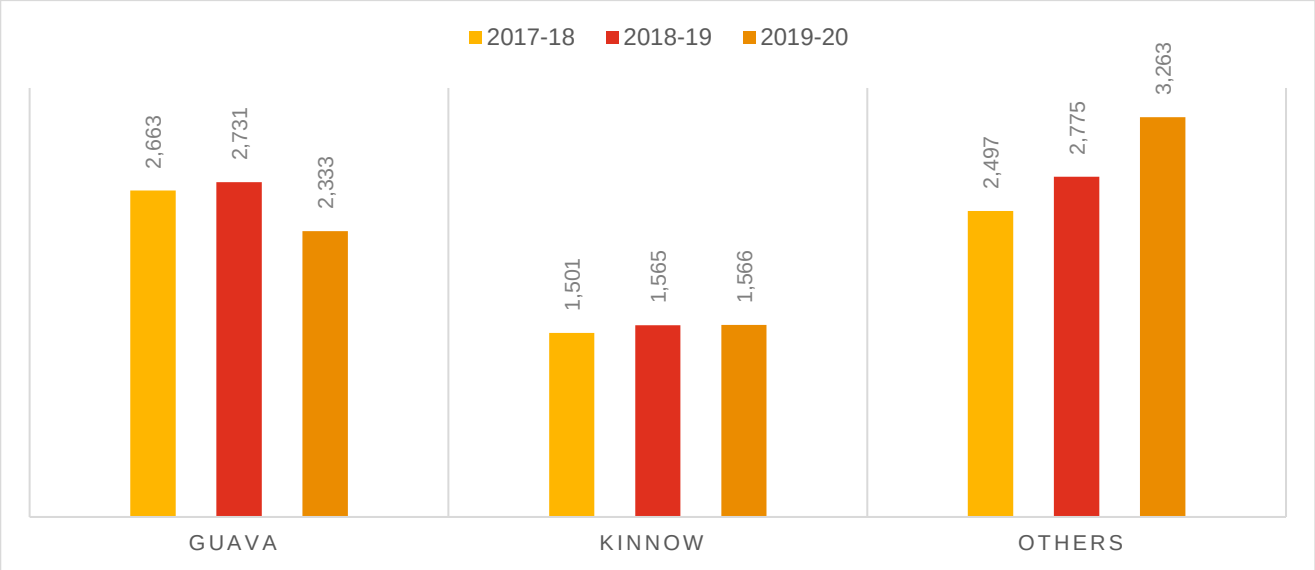


Graph 130: Major fruits & vegetables grown in Kapurthala district (2019-20)

Out of all vegetables, maximum area is under Potato, over 90% of the production is that of seed potato. **The area and production of tomato in the district is at number three,** The district produces a wide variety of fruits like kinnow, guava and ber and that too in small quantities. The district reported a cumulative growth of above 23% in area under all fruit crops taken together in last four years from 2016-17 to 2019-20

Production trend-fruits

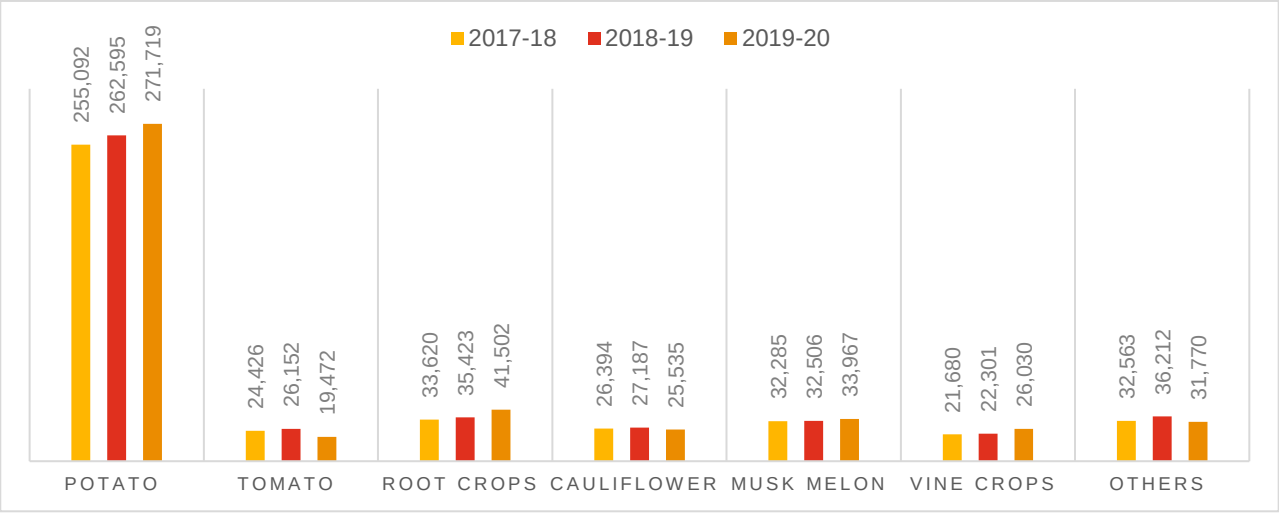
Production of kinnow and other fruits like pear, peach, lime have increased in last three years however production of guava has shown decline in 2019-20 compared to 2018-19.



Graph 131: Production trend of fruit crops in Kapurthala district (MT)

Production trend-vegetables

Production of Potato, root crops, muskmelon, vine crops have shown increasing trend in last three years. However, production of tomato and cauliflower has decreased since 2018-19 in 2019-20.

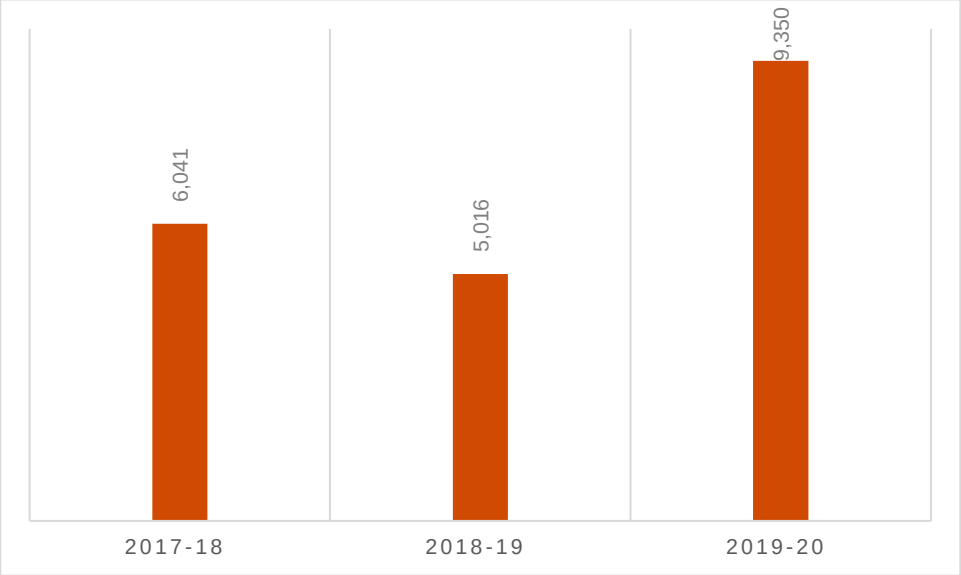


Graph 132: Production trend of vegetable crops in Kapurthala district(MT)

4.17.6. Allied activities

Production trend- Fish

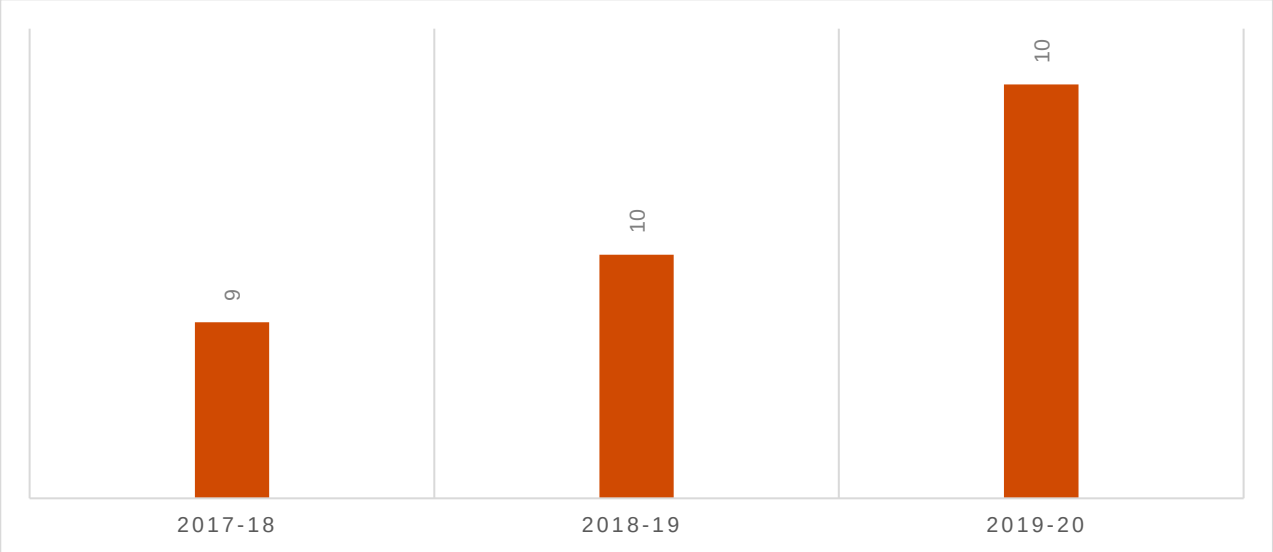
The fish production has shown an erratic behaviour i.e., from 6,041 MT in 2017-18, it came down to 5,016 MT in 2018-19 and then it went up to 9,350 MT in 2019-20, a growth of 86% in one year.



Graph 133: Production trend of fish in Kapurthala district (MT)

Production trend- Milk

There has been consistent growth in the production of milk in past three years with 10.21 lakh litre/day during 2019-20, a cumulative growth of about 9%.



Graph 134: production trend of Milk in Kapurthala district (LLPD)

4.17.7. Industrial profile

There were 4421 registered Micro Small enterprises in the district and 6 registered medium and large enterprises providing employment to 24,627 and 16,986 persons respectively, as per FY 2014-15. There is an industrial area in the district.

Table 19: Industry in Kapurthala

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	4421

2	Registered Medium & Large Units	No.	6
3	Employment in MSE Sector	No.	24627
4	Employment in Large and Medium Industries	No.	16986
5	No. of Industrial Areas	No.	1
6	Turnover of MSE Sector	Rs. Lakh	90735.16
7	Turnover of Large & Medium Sector	Rs. Lakh	194369.00

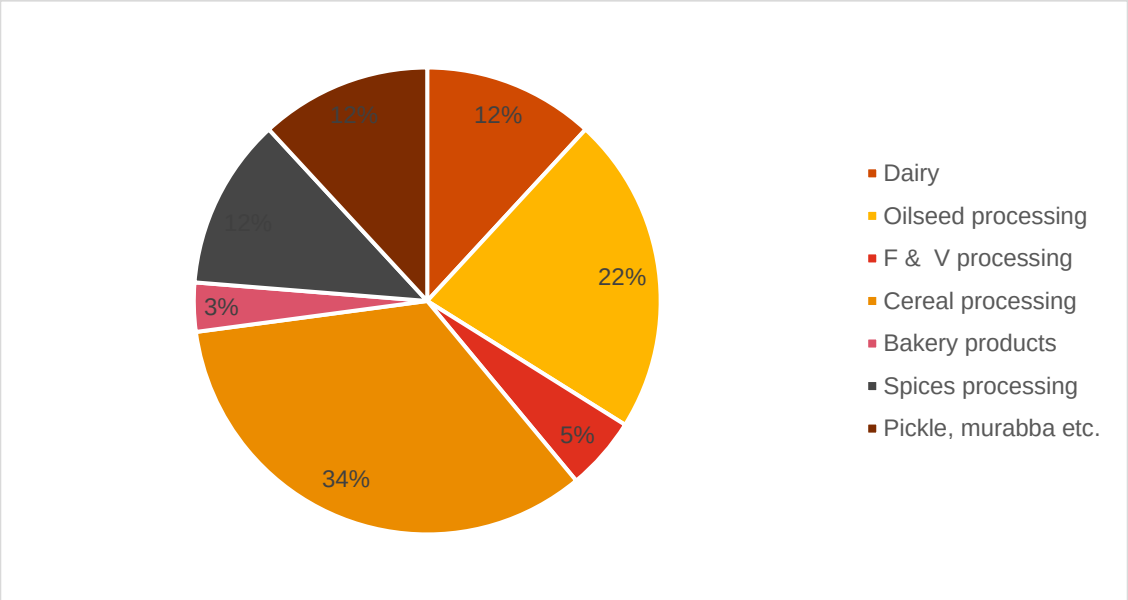
Source: District Industries Centre, Kapurthala

ITC Integrated Food Park, Kapurthala is the major food processing unit in the district.

There were about 500 wheat flour mills in the district out of which 8-10 are mini semi-automatic types, and more than 60 rice mills of average capacity of 2 MT/hr. About 10 atta chakki owners have installed oil expellers in the same premises.

There are no major organize sector processing unit of fruits and vegetable in the district. However, there are number of individuals/micro enterprises, FPOs/SHGs etc. manufacturing and marketing products like honey, pickles etc.

There is one large milk processing plant in the district and many small dairy farms manufacturing dairy products like paneer, curd, lassi, butter, cream, khoya, sweet meat, etc. The district also has over 200 bakery units. The micro enterprises has been established with an average investment of INR 2.90 lakhs with a an average annual turnover of INR 5.89 lakhs.



Graph 135: Spread of different micro food enterprises in Kapurthala district

Source: Primary Research

4.17.8. ODOP

Tomato is selected as ODOP for Kapurthala district. Tomato, though botanically a fruit for the purpose of trade, is generally considered a vegetable because of the way in which it is consumed. It is a short duration, high-yielding, remunerative crop, and hence area under its cultivation is increasing year on year.

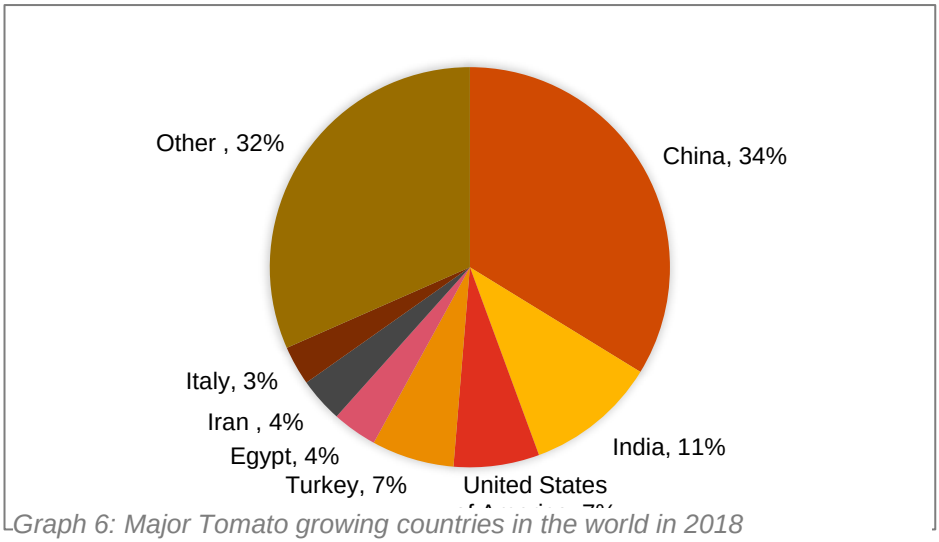
Tomato fits easily into different cropping systems and has high economic value and fruits can be processed, dried, canned and bottled. Moreover, tomatoes contribute to a healthy, well balanced diet primarily. Tomatoes are rich in potassium, magnesium, phosphorus and small amounts of calcium. Tomatoes contain a lot of vitamin A, vitamin C and vitamin B3. They have small amounts of other B vitamins, and vitamin E

The crop is broadly categorized based on the form of consumption. Fresh market tomatoes, which are consumed as table purpose or used in culinary in households. Wide range of value-added products like soup, salad, pickles, ketchup, puree, sauces, etc. can be formed from tomato.

In India, tomato sauce and ketchup are very popular and are being manufactured on an increasingly large scale, mostly in small units. India has been exporting processed tomato in the form of tomato paste and ketchup.

As tomatoes are available practically throughout the year, there is scope for setting up large-scale processing units. The quality of a tomato product is judged by its color, which is dependent on the redness of the tomatoes used. In fact, the red pigment (lycopene) can be used as an index of the amount of tomato present in a product.

The vast area and round the year cultivation of tomato offers good opportunity for export. India exported 2.67 lakh tonnes of tomatoes valued at ₹54,806 lakh during 2016-17. Agri Export Zones are established by the Agricultural and Processed Food Export Development Authority (APEDA) in Punjab, U.P, Gujarat, Bihar, Jharkhand and West Bengal for promoting exports of vegetables.



Graph 6: Major Tomato growing countries in the world in 2018

Source: FAOSTAT

India stands second in tomato production in the world next to China. The area, production and productivity particulars ten major tomato growing countries are depicted in the graph. In world, India is the second largest tomato producing country after China. As per FAOSTAT, 2018, India produces 1.94 Million tons of tomato which is 11 % of total world production in an area of 0.79 Million hectares which in turn is 16.50 % of total area under tomato in the world. Whereas China contributed nearly 34% of the world production in nearly 22% of the total tomato cultivated area of the world.

Productivity of India is comparatively less i.e., 24.65 tons/ha, as compared to world average productivity i.e., 55.56 tons/ha. Productivity of tomato was also much lower when compared to the other major tomato growing countries such as USA at 96.8 tons/ ha., China 59.4ton/ ha. and even the world average of 55.56 ton/ha.

National clusters

The southern and central states contribute maximum to the total tomato production in India. The major tomato producing States in the country are Andhra Pradesh, Madhya Pradesh, Karnataka, Gujarat, Odisha, and West Bengal. All these states accounted for more than 60% of the total tomato production of the country, Punjab had a share of 1.14% only in 2017-18. Odisha has the largest area under tomato followed by Madhya Pradesh.

States	Production (in '000 MT)
Andhra Pradesh	2,744
Madhya Pradesh	2,419
Karnataka	2,082
Gujarat	1,358
Odisha	1,312
West Bengal	1,265
Uttar Pradesh	842
Himachal Pradesh	482
Punjab	224
Others	7,031
Total	**19,759**

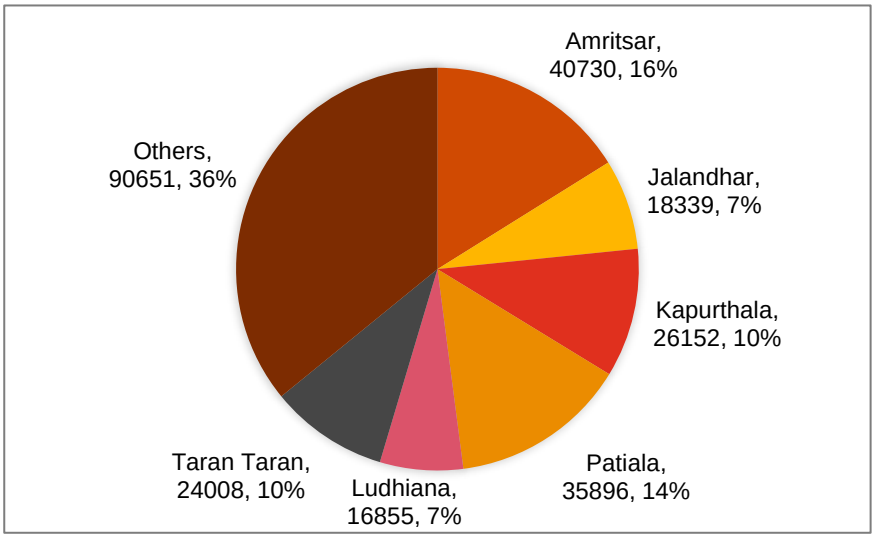
Average yield of tomato in India has increased from 15.90 t/ha in 2007 to 25.47 t/ha in 2016-17 and this is because of the increase in availability of better inputs, seeds and use of better cultivation methods.

Table 2: State wise production of Tomato (2017-18)

Source: Horticulture statistics at a glance in 2018

Clusters within state

Punjab is on 19th position in tomato production and contributes to approx. 1.13% of the national production. Tomato's yield (24.89 ton/ha) in Punjab is close to national average (25.04 ton/ha) but it is much lower than the yield of Himachal Pradesh, Uttar Pradesh, Andhra Pradesh, MP, Karnataka and Gujarat. This indicates further scope for increase in production in the state with same acreage. Amritsar contributes highest in the states production with 16% share of total production, followed by Patiala and Kapurthala.



Graph 7: Major tomato producing districts in states (in MT year 2018-19)

Source: Department of horticulture, Punjab Govt

4.17.8.1. Clusters of Tomato in Kapurthala district

Kapurthala is the third largest producer of tomato in the state after Amritsar and Patiala. The area under tomato in the district recorded a consistent growth from 855 Hectare (22,215 MT) in 2016-17 to 940 Hectare (24,426 MT) in 2017-18 to 1,006 Hectare (26,152 MT) in 2018-19, a cumulative growth of 18%.

Punjab Rata, Punjab Chhuhara, Punjab Tropic, Punjab Upma, Punjab NR 7, Punjab Red cherry, Punjab Varkha Bahar 2, Punjab Varkha Bahar 1, Punjab Swarna, Punjab Gaurav, Punjab Sartaj are popular varieties grown in the state. Punjab Ratta is suitable for processing and average yield is 225 quintal per acre.

There is no specific cluster of tomato production in the district, it spreads in:

- Kapurthala
- Phagwara
- Sultanpur Lodhi
- Bolanath

Tomato is produced in Rabi as well as Kharif crop. Seasonal table of tomato production is shown in below:

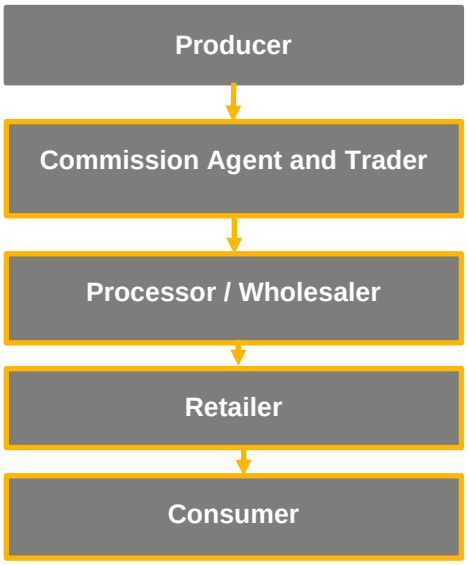
State/Season	Month of Sowing	Month of Transplanting	Month of harvesting
Kharif	May-June	June-July	Sept-Oct
Rabi	Oct-Nov	Nov-Dec	Feb-Mar

4.17.8.2. Insights about the industry and sector

Wide range of value-added products like soup, salad, pickles, ketchup, puree, sauces, etc. can be manufactured from tomato.

5. Value chain of Tomato

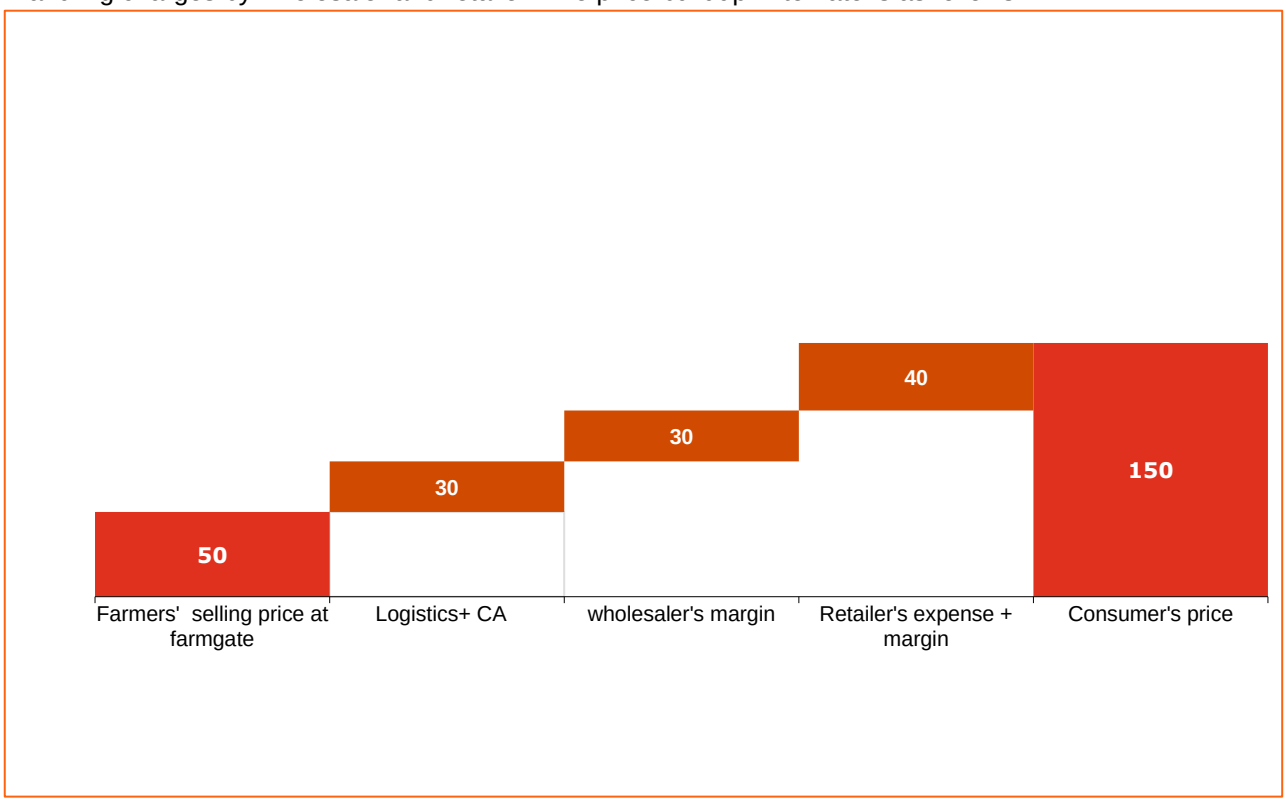
The most predominant system of marketing for tomato is through APMC Mandis and it is generally done by middlemen like commission agents and traders who are present in vegetable markets. Market commission agents operate at market level and pay a fixed percent of charges to the government. Traders, on the other hand, are wholesalers who purchase tomato from one market or directly from farmers and sell to markets of other states to realize the profits on their purchase. Market commissioning agents maintain a good relationship with the same professionals operating at other markets all over India. These middlemen are supposed to play a vital role in matching demand with supply in the market. Corporate retailers and direct market license holders like Reliance Fresh, Aditya Birla Retail, etc., are having their own collection centers and procurement mechanism.



Marketing costs are the actual expenses incurred in bringing goods and services from the producer to the consumers. The marketing costs normally include:

- Handling charges at local points
- Assembling charges
- Transport and storage charges

Handling charges by wholesaler and retailer. The price buildup in tomato is as follows:



Graph 8: Value chain and supply chain of Tomato in the district. ***(value In Rs per 10 Kg)***

6. Challenges in the tomato value chain

Due to lower price offered by middlemen/traders, the producers' share in consumer is very little in for tomato. Besides lower share of producers, other problems like low productivity of crops, rapid change in climatic conditions, lack of inadequate availability of improved inputs & technology, higher losses due to insect pest & disease attack, lack of processing facilities and lack of credit & marketing facilities are also faced by stakeholders.

o) Unavailability of pre-cooling transportation facilities

Fruits are normally harvested early in the morning or evening. The harvested fruit basket or plastic crates and cool shed for storage, it helps in preventing the fruits from crushing. To increase self-life of tomato during long distance transport pre-cooling vehicle is required. Producers in the district do not have infrastructure for transportation of tomato to long distance, because of which farmers are forced to sell in the local market or to the commission agent.

p) Unavailability of storage facilities

The district lacks proper storage facilities and because of which farmers are forced to distress sell even if the price is lower in the market.

Full ripe tomatoes need to be stored at a temperature of 55°F for up to several days. Temperature cooler than this, will cause chilling injury, producing poor colors and off flavors. Due to improper storage, there is a loss in fresh weight of about 10-15%. This causes them to appear shriveled and stale. There is need of better storage infrastructure in the district.

q) Unavailability of skilled human resource for processing

There is lack of skilled human resource in the district. Mostly farm laborer from Uttar Pradesh and Bihar are engaged in the farming related activities. Local labors are also available and involved in daily wage basis.
Human resource involved are mostly unskilled for value addition related process. For processing and value addition of tomato there is need of skill improvement of the manpower. It is not available currently in the district.

r) Unavailability of processing facilities in the district

There are very few processing unit available in the district for tomato, so farmers directly sell their produce to local mandi or local aggregator. Processing of the tomato will help in its value to high value products, which can cater export demand of many countries and it can help in better price realization to farmers for their produce.

s) Unavailability of testing facilities for value added product

Soil testing labs are prevailing the district, many farmers are availing service of soil testing labs and they find it very useful but testing facility for value added products is not available and there is need to develop these facilities.

t) Lack of Institutional support

The district does not have community-based institutions like FPO, Cooperatives etc. which involve in trading or processing of tomatoes. There is need to strengthen the institution base in the district.

u) Issues in credit linkage

Credit is an essential input in agriculture that has multiple effects on production and farm income. Lack of information on credit product and small scale of operation found to be major limiting factor in accessing the credit. Many farmers and entrepreneurs are not able to get credit facility to establish processing unit because of non-availability of asset for mortgage.

4.17.8.3. Suggested intervention and vision

Post-harvest loss in case of Tomato (13%) is one of the highest among fruits and vegetables. Tomato production is a growing in the district as consumers demanding a wider range of innovative, value-added products.

There is no existing processing unit in the Kapurthala district for processing of tomato. Setting up of small or medium scale unit in the district will help in increasing the production and income of the farmers.

There is need of development of processing infrastructure in the district, it will also help in generation of employment opportunity in the region. The community-based institution can be established at ground, which can

work for establishing processing units, market and developing skill, capacity building of farmers for processing of tomato. Tomato processing can help district in developing it as important ODOP of the district, SWOT analysis for this is shown in the table.

SWOT Analysis	
Strengths: • Continuous increase in the area under cultivation. • Availability of better post-harvest infrastructure.	**Weakness:** • Fall in the prices during glut season. • Lower share of producers in consumer's rupees. • Perishable nature of the produce.
Opportunities: • Opportunity for higher level of processing. • Marketing through collaboration with organized retail players.	**Threats:** • Rising cost of production for the producer. • High amount of wastage and inefficiencies in supply chain.

Gaps and interventions suggested for development of tomato value chain in the district is given below;

Particulars	Gaps/Problems	Suggested interventions	Intervention agencies	Actions under PMFME
Production	Production of varieties suitable for processing	• Intended processors can lock his area/farmers for the desired varieties through formal/informal buying agreement. District department can do extension work on selection of variety. • Private seed companies can be also roped in Department	Directorate of Horticulture	Technical support district department of horticulture in area expansion
Harvesting	Right Maturity index and Post-Harvest Management till processing/selling	Right Maturity and Post- Harvest Management till processing/selling	Directorate of Horticulture	Technical Support District department of Horticulture
Farm level	• Absence of sorting/ grading and limited product handling facility • Absence of storage infrastructure • Wastage is high	• Creation of farm level primary processing centres with sorting, grading, cleaning, packaging and transportation facilities • Creation of Common Processing	• Individual entrepreneurs • Farmers • SHGs • Farmer Producer Companies • SRLM • Existing Food Processing Units	• Assistance in availing benefits of individual units • Assistance in availing benefits of group enterprises

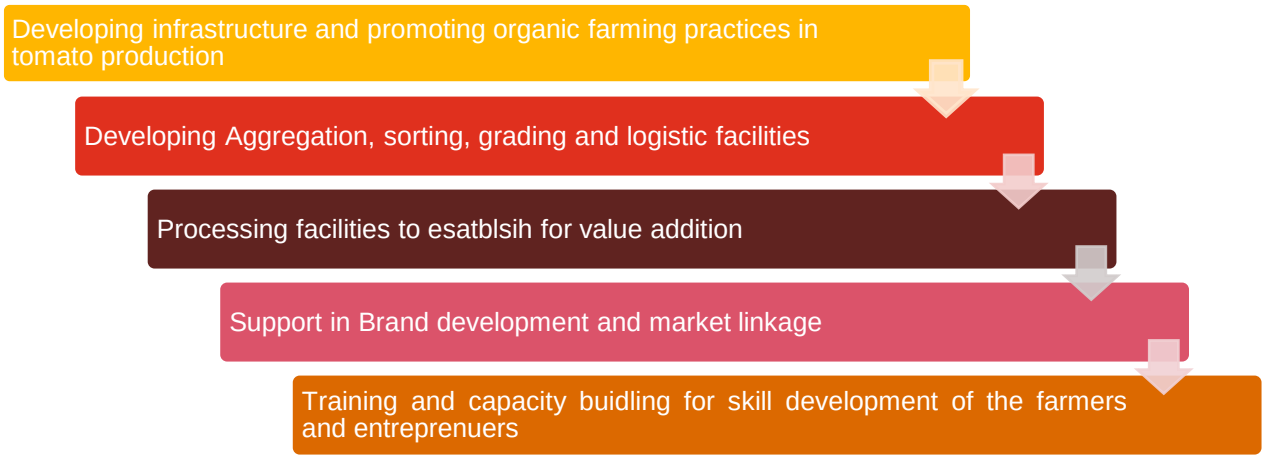
Particulars	Gaps/Problems	Suggested interventions	Intervention agencies	Actions under PMFME
		Centres in production clusters		• Formalizing existing enterprises • Setting up tomato processing units • Targeting seed capital beneficiaries of SRLM
Storage infrastructure	• No packhouses available • Very few cold storages	• Setting up of Tomato packhouse • Setting up of cold chain infrastructure • Primary Processing Centres with storage facilities	• Individual entrepreneurs • Farmers • SHGs • Farmer Producer Companies • SRLM • Horticulture Directorate • Existing Food Processing Units	• Assistance in availing benefits of individual units • Assistance in availing benefits of group enterprises
Processing units	• No tomato processing units available in Kapurthala district • Market is predominately for fresh vegetable	• Individual micro enterprises may be set-up • Strategic promotional activities to mobilise local investors/farmers • Setting up of Common Incubation Facility	• Individual entrepreneurs • Farmers • SHGs • Farmer Producer Companies • Existing Food Processing Units • KVKs • Private Institutions	• Assistance in availing benefits of PMFME Scheme • Connecting tomato processors with bigger players like Kissan, Nilons etc for job work enterprises • Tomato based multi-commodity processing units
Capacity building	• Processing based skills of farmers is lacking • Entrepreneurship Skill is also lacking • No awareness about GMP, GHP, licensing, statutory clearances	• Development of customized training curriculum • Organising beneficiary training	• SLTI • NIFTEM • DRPs	• Training Fund under PMFME Scheme • Product development training • Exposure visits to successful models in other States

Particulars	Gaps/Problems	Suggested interventions	Intervention agencies	Actions under PMFME
Marketing and branding	• No concrete knowledge on market enhancement and processes/ techniques to follow • No big buyers are present • Packaging not been focused • Mostly local market covered	• Development of marketing and branding plan/ reports • Organising buyer-seller meet • Development of packhouses with modern packaging facilities	• SPMU • SLTI • Farmers/ Investors/ SRLM	• Availing benefits of marketing and branding funds under scheme • Identifying FPCs interested in tomato processing

Suggested model

There are many products which can be formed by processing of tomato like ketchup, puree, sundried tomato, canned tomato etc.

Intervention required for tomato processing need to focus on all the aspects of post-harvest management which include sorting, grading, logistic, processing to value added products and finally branding and market linkage of the processed products. Based on the existing challenges and prevailing conditions in the district, following interventions are required: -



Suggested interventions for overcoming the challenges of existing of value chain are shown below:

#	Particular	Interventions
1	Marketing support to farmers	Farmers of the area witnessed the unfair trade practices which severely affected the entire farming community hence the concerned authorities are advised to extend the online trading platform (e-NAM) to cover the entire Tomato growing area in a phased manner. Marketing infrastructure of value-added products need to be established and value-added products of tomato need to be developed.
2	Manufacturing practices	There is huge scope of export for tomato paste, puree, ketchup, juice and sauce. Processing units should be established in blocks of Kapurthala district, which will help in participation of farmers in value addition process.

3	Technologies	There is an urgent need for the establishment of processing unit containing modern technology of vacuum evaporation through the use of forced circulation evaporators/scrapped surface evaporators.
4	Access to finance	Care need be taken by lending agencies to reduce the transaction cost by giving appropriate credit, removal of intermediaries and introduction of paperless loans that reduce both cost and energy.
5	Access to mentorship / service	SLTI, local level government institutions, KVKs can focus on skill and capacity building of the human resource and farmers and mentorship service to the farmers and entrpreneurs.

Table 3: Suggested interventions for tomato processing

4.17.8.4. Pre-processing and post-harvest management

Infrastructure for pre-processing and post-harvest management need to be development. The better-quality product get higher price and it help high standard end value added product.

k) **Sorting-grading facilities and skill development**

At producer level innovative technology based sorting and grading facilities need to be developed which can sort tomatoes based on different criteria so that damaged, rotten, cracked produce can be separated from healthy, attractive, clean, and bright fruits, which can get better price.

The grades are mostly based on the condition and the quality of the fruits and not specifically on their size. However, based on the size of the fruits three grades are formed: small (<100 g), medium (100-255 g) and large (> 255 g). The size requirement for different grades shall be as follows:

Variants	Super (Dia in Mm)	Grade-A (Dia in Mm)	Grade-B (Dia in Mm)	Grade-C (Dia in Mm)
Tomato (hybrid)	61-80	51-60	40-50	Any other size
Tomato (local)	56-70	41-55	30-40	
Tomato (oval)	N.A.	> 41 Length > 55 mm	30-40 Length >41 mm	
Tomato (cherry)	N.A.	20- 30	31-40	

Table 4: Different grades of tomato

Source: Agmark

l) Better storage facilities

There is need of developing better quality storage infrastructure for tomato so that wastage can be reduced, and value addition can be done. Different technology-based infrastructure solutions are explained below:

Low temperature storage: This is a time-tested reliable method used for retention of freshness and extending shelf life of fresh produce as it reduces rate of respiration and thermal decomposition. Chilling injury may erode the quality of fruits if storage temperature is less than 12.5^0C.

Ethylene treatment: By treating ethylene either as a dip treatment or gaseous exposure using ether as a source of ethylene, uniform accelerated ripening can be obtained. Further, by removing the ethylene produced by fruit with the use of ethylene absorbent either prepared indigenously or by use of 'purafil' (commercial form of ethylene absorbent), significant extension of shelf life.

Evaporative cooling of tomato: Evaporation of moisture from tomatoes causes wilting and shriveling, resulting in weight loss. The process of evaporative cooling is an adiabatic exchange of heat when ambient air is passed

through a saturated surface to obtain low temperature and high humidity, which are desirable for extending the storage life of tomato.

MAS using silicone membrane: It is controlled ventilation system, which regulates the gas levels in the storage environment by recycling on selective gas permeation. The membrane makes use of ability of the polymer to allow the selective passage of gases at different rates according to their physical and chemical properties.

Storage facilities need to be developed in the district as per the feasibility**.** There is need of skill and infrastructure development storage practices.

4.17.8.5. Processing industry of Non-ODOP products in district

Study is conducted for 65 food processing units in the Kapurthala district. Out of these units 18% are edible oil production, 25% are engaged in storage facilities and other Agri products by providing storage facilities. Based on production Potato can be considered as second best alternate for ODOP.

#	Type of Processing industry	Number of plants
1	Storage	16
2	Edible Oil	12
3	Dairy	7
4	Fruit Processing	5
5	Noodles	5
6	Vegetable Processing	4
7	Alcohol	3
8	Grain Processing	3
[illegible]	[illegible]	2
[illegible]	[illegible]	2
[illegible]	[illegible]	2
12	Logistic	1
13	Mineral water	1
14	Rice Mill	1
15	Tomato processing	1

Graph 7: Food processing units of Non- ODOP products in Kapurthala

Source: FSSAI, analysis PwC

4.18. SBS Nagar (Nawashahar)

4.18.1. Socio economic profile

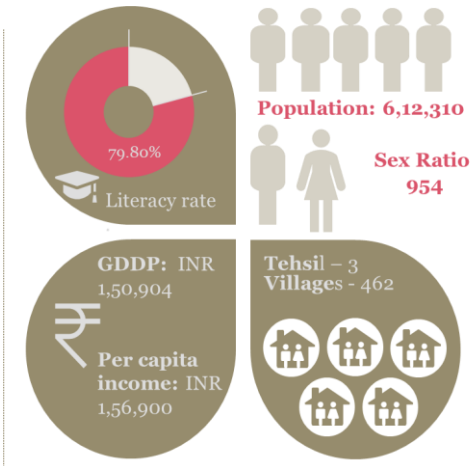
The original name of Sahid Bhagat Singh Nagar (S.B.S. Nagar) was Nawanshahr, which was carved out of Hoshiarpur and Jalandhar Districts of Punjab in the year 1995 on the auspicious occasion of birthday of Sh. Guru Nanak Dev Ji, as the 16th district of Punjab State. It is surrounded by four districts. The Western border of the district touches with district Jalandhar, Eastern border touches with district Roop Nagar (Ropar), the Northern border meets with district Hoshiarpur and Southern border touches with district Ludhiana and district Kapurthala. The district **Shahid Bhagat Singh Nagar is one of the smaller districts of Punjab.**

Headquarters of the district is located at Nawanshahr town, the district has three tehsils namely, Nawanshahr, Balachaur and Banga. The district is comprises of 5 blocks name as , Aur, Nawanshahr, Balachaur, Saroya and Banga. According to the 2011 Census, the district has 462 villages.

The district Gross District Domestic Product (GDDP) and per capita income during 2015-16, at current prices, was much above than the state average. **the district tops in the PCI amongst all districts of the state.**

4.18.2. Demographic profile

According to the 2011 census, SBS Nagar district has a population of 6,12,310 of which male and female population were 51.17% and 48.83% respectively. Out of the total population of the district, 79.5% is rural and 20.5 % is urban. The district has recorded a decadal growth rate of 4.2% which is lower than that of state average. The district has density of 478 persons per sq. km. The district has a sex ratio of 954 females per 1000 males, was ranks 2nd among the districts in the State. The literacy rate of the district was 79.8%.

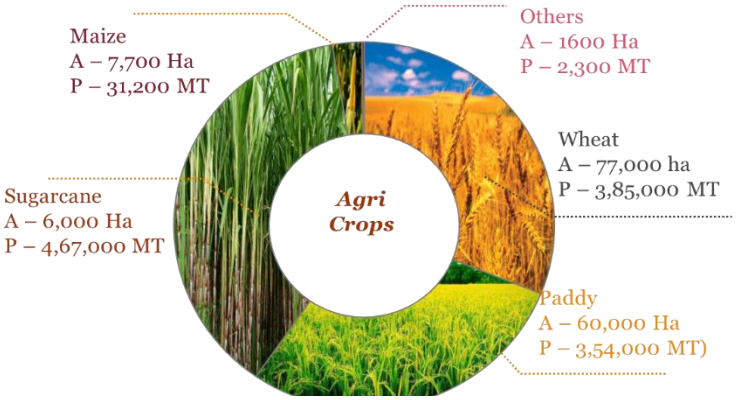


4.18.3. Climate and Rainfall

The climate of the district is characterised by general dryness except for a short period during south-west monsoon season. May and June are the hottest months when mercury may cross even 45^{0}C. During the period from December to February the winter is quite severe and mercury may hover around 5^{0}C and on some days it may even touch 0^{0}C. The average annual rainfall in the district is 924 cm. July is the wettest month. The rainfall during the period is caused by the influence of South-Westerly, monsoon, whereas the winter rain in the months of January and February is the result of Western disturbance in the Persian Gulf.

4.18.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is 76%. The district has the cropping intensity of 185%. The land is fertile due to the presence of river Sutlej and irrigated through tube wells and canals except some part of the Balachaur sub-division falling in Kandi Area. Wheat and paddy are the main Rabi and kharif crops of the district. The other major crops of the district include maize and sugarcane. The district also grows rabi oilseed (sarson & taramira) in small quantity.

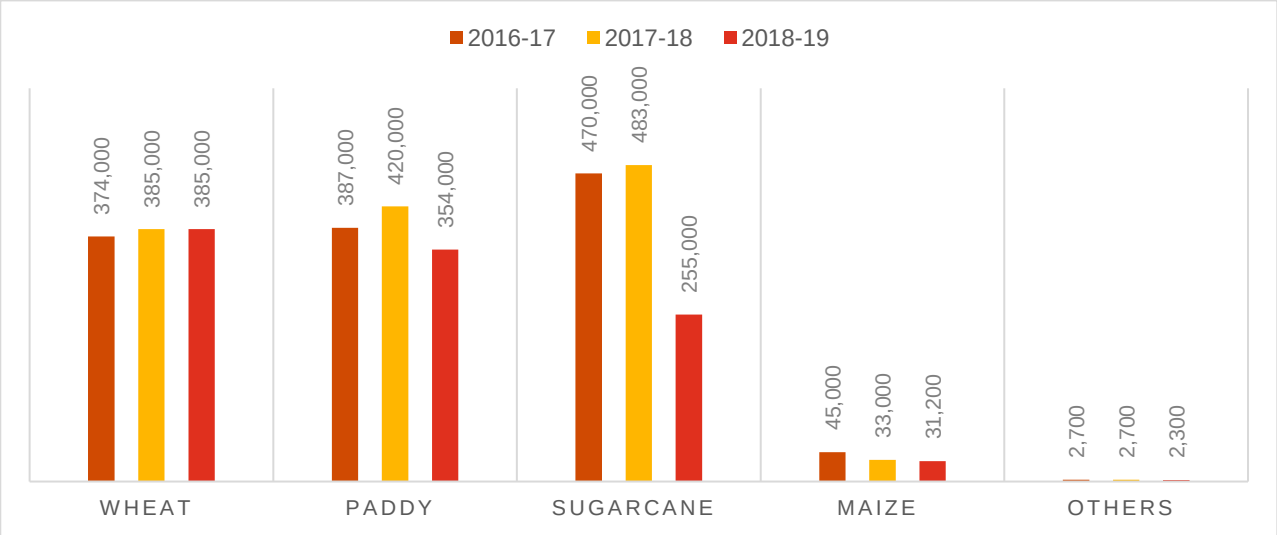


Graph 136: Major Field crops grown in district SBS Nagar (2018-19)

Source: Department of Agriculture, Govt. of Punjab

Production Trends – Field crops

Production of wheat has been consistent over past three years. However, production of paddy, sugarcane and maize has been erratic.



Graph 137: Production trends of field crops in the district of SBS Nagar

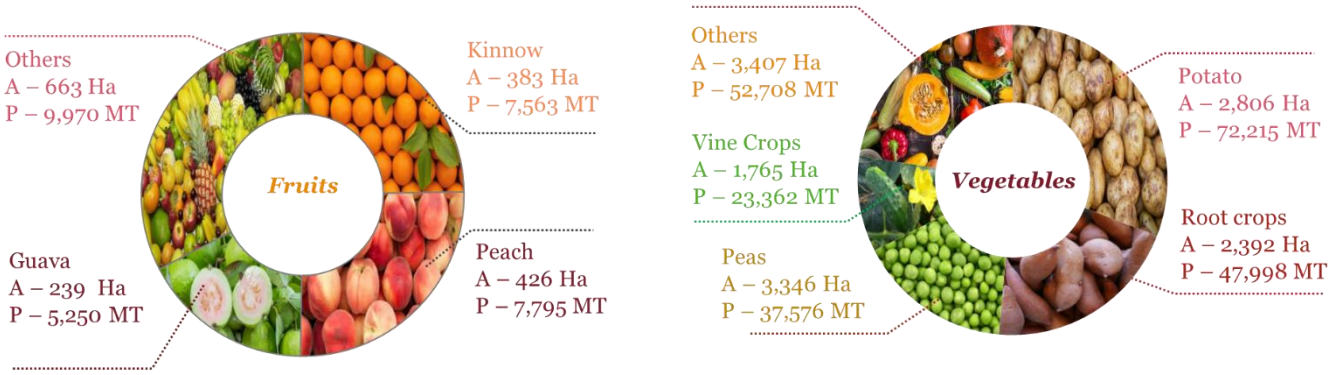
Source: Department of Agriculture, Govt. of Punjab

Horticulture profile

The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc. and that too substantial quantities. Overall there is cumulative growth of over 20% in the area under vegetables in last four years (from 2016-17 to 2019-20).

Out of all vegetables, maximum area is under Pea, which reported a cumulative growth of 29% in last four years. The district SBS Nagar is the third largest producer of peas, after Amritsar and Hoshiarpur.

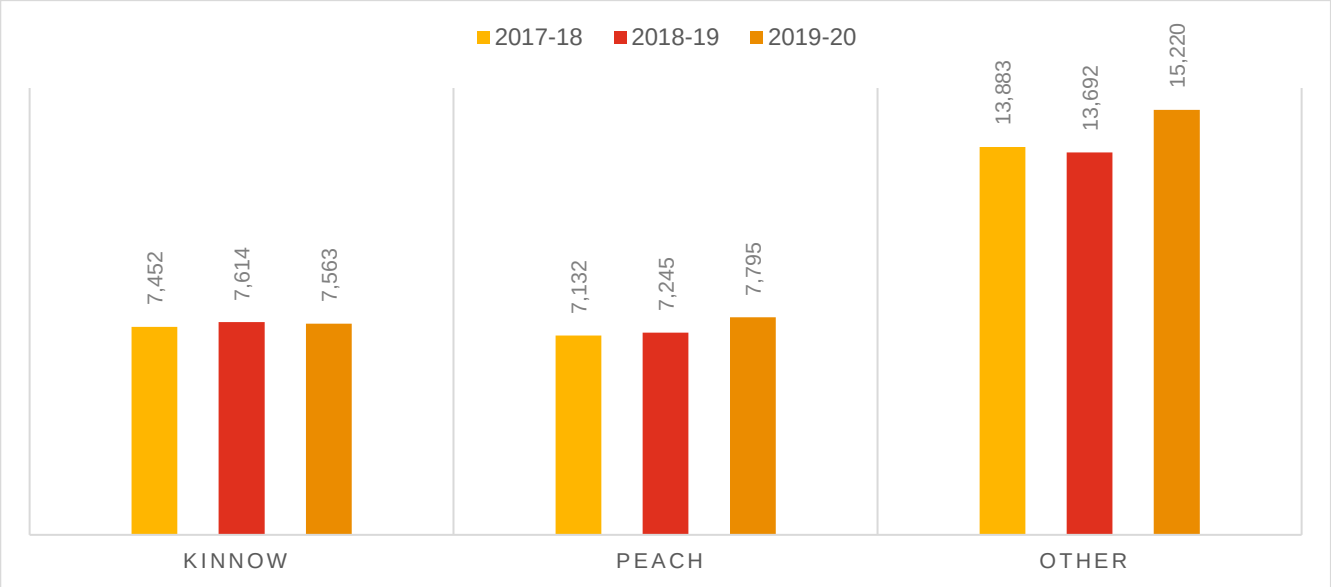
The district produces a wide variety of fruits like mango, pear, kinnow, guava etc. During the period from 2016-17 to 2019-20, the area under fruits reported a cumulative growth of 20% under all fruit crops taken together.



Graph 138: Major fruits and vegetables grown in district SBS Nagar (2019-20)

Production trend of fruits

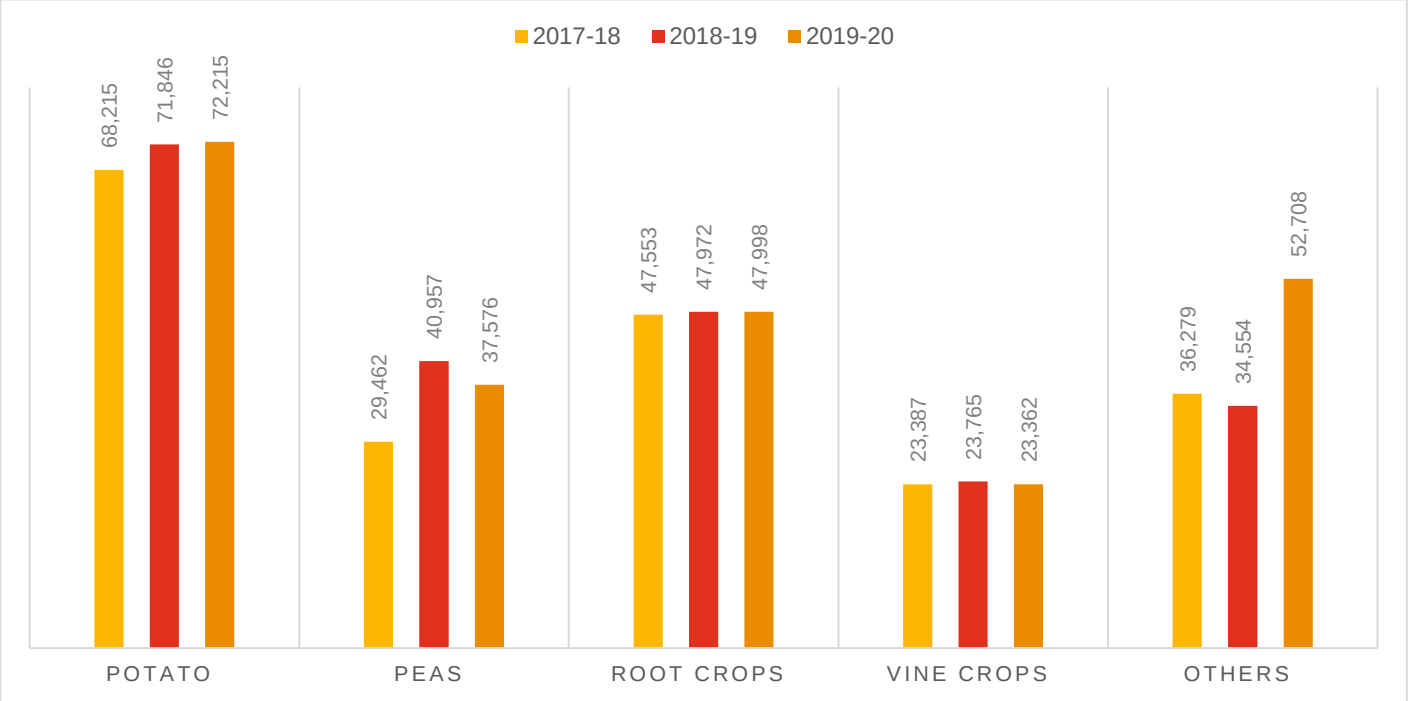
Production of fruit crops in the district has shown consistent trend in last three years.



Graph 139: Production trend of fruits in SBS Nagar district (MT)

Production trend of vegetables

Production of potato, root crops and vine crops has increased marginally over last three years. However, production of peas has decreased from 2018-19 in 2019-20. Production of other crops like brinjal, tomato, cabbage etc. has shown substantial increase in 2019-20 in comparison to 2018-29.

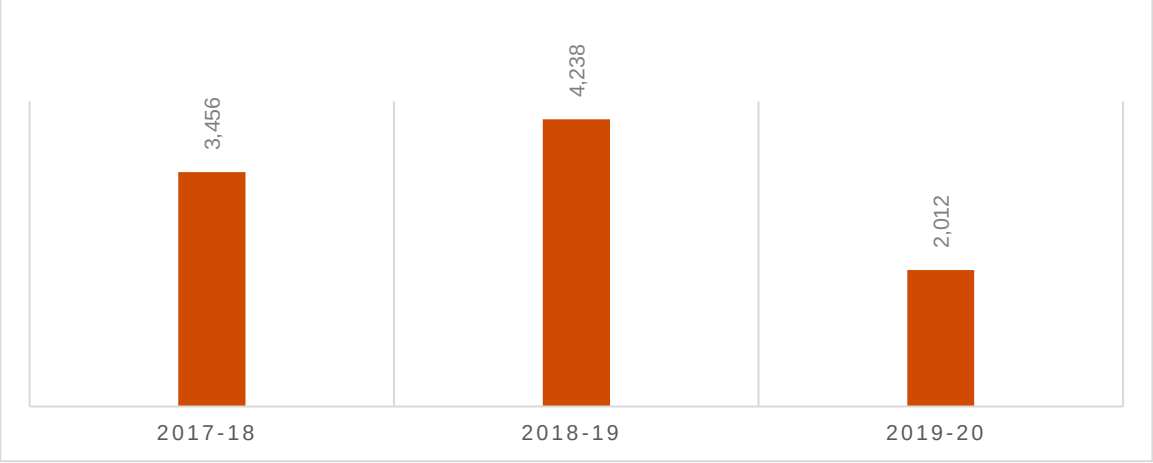


Graph 140: Production trend of vegetable crops in SBS Nagar district (MT)

4.18.5. Allied activities

Production trend- Fish

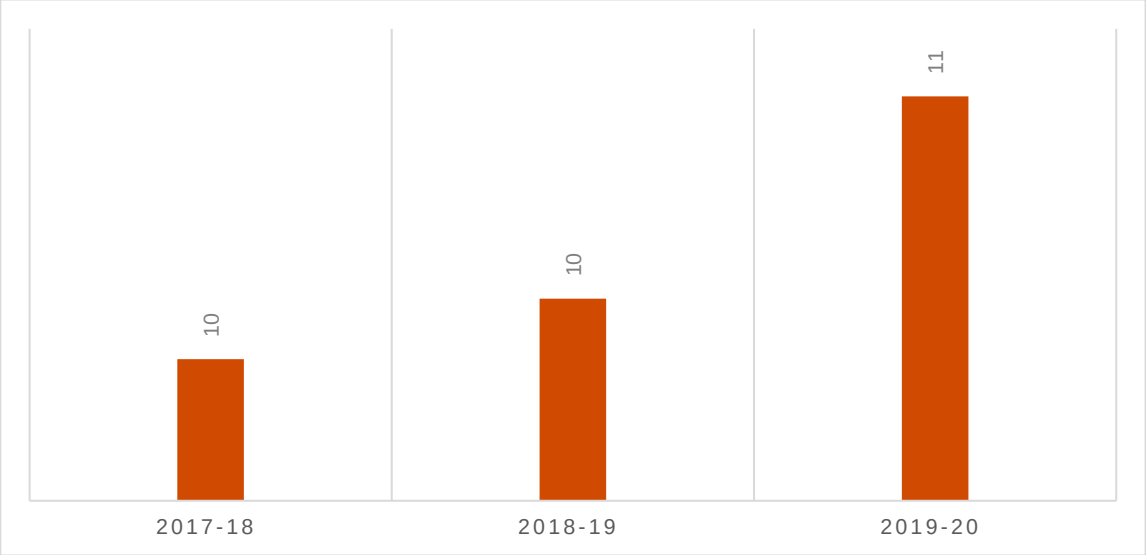
Fish production in the district has shown erratic behaviour. During 2017-18, the production was 4,480 MT, then it increased to 5,025 MT in 2018-19 and in 2019-20 it dropped down marginally to 4,969 MT. However, there is a good demand for fish in the district. The surplus production goes to neighboring districts for sale.



Graph 141: Production trend of fish in SBS Nagar district (MT)

Production trend- Milk

There has been consistent increase in the production of milk in the district in last three years with 12.38 lakh litre/day during 2019-20.



Graph 142: Production trend of milk in SBS Nagar district (LLPD)

4.18.6. Industrial profile

There were 2371 registered Micro Small enterprises in the district and 9 registered medium and large enterprises providing employment to 8846 and 4190 persons respectively, as per FY 2014-15. There is an industrial area in the district.

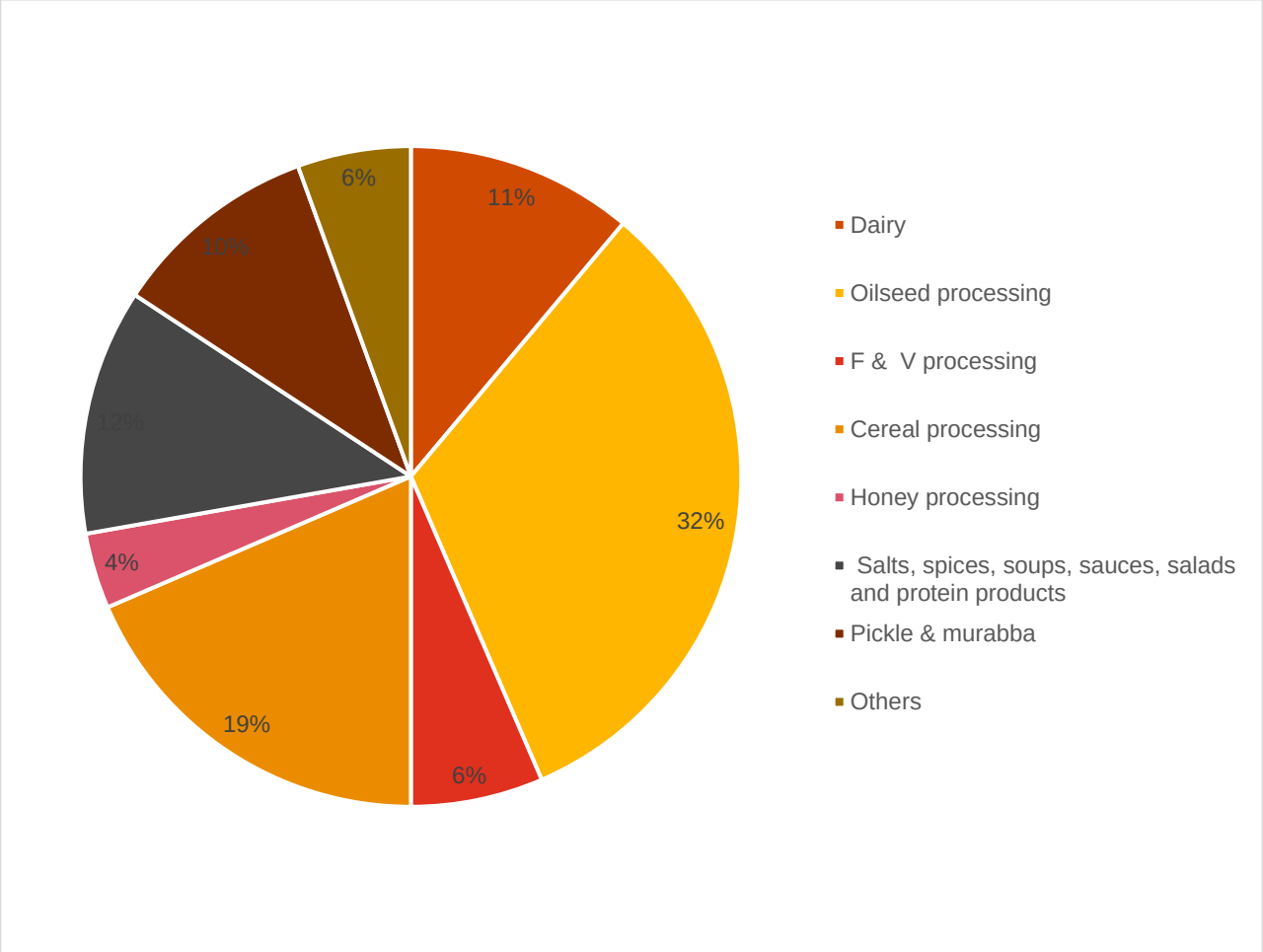
Table 20: Industry in SBS Nagar

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	2371
2	Registered Medium & Large Units	No.	9
3	Employment in MSE Sector	No.	8846
4	Employment in Large and Medium Industries	No.	4190
5	No. of Industrial Areas	No.	1
6	Turnover of MSE Sector	Rs. Lakh	13720.63
7	Turnover of Large & Medium Sector	Rs. Lakh	358105.43

Source: District Industries Centre, SBS Nagar

There were about 350 wheat flour mills in the district out of which 6-8 are mini semi automatic types, and more than 40 rice mills of average capacity of 2 MT/hr. About 25 atta chakki owners have also installed oil expellers in the same premises.

There is no fruits and vegetable processing unit in the organised sector in the district. However, there are micro enterprises and FPOs engaged in the manufacture of pickles, murraba, juices etc. The district also has over 200 bakery units.



Graph 143: Spread of micro food enterprises in SBS nagar

4.18.7. ODOP: Pea

India ranks second in terms of production and area in the world and account for 25.5% of the world production[60].

Table 21:Country wise Peas production and area in the world in 2017-18

Country	Area Harvested (ha)	% Area	Production (MT)	% Production
China, mainland	1615083	58.86	12960844	61.06
India	543000	19.79	5430000	25.58
United States of America	53054	1.93	230048	1.08
France	39076	1.42	251082	1.18
United Kingdom	36274	1.32	119169	0.56
Algeria	35897	1.31	186203	0.88
Peru	34425	1.25	135912	0.64
Total World	**2743867**		**21225577**	

Source: FAOSTAT

Pea is predominantly Rabi crop in India and has domestic and as well as export growth potential. It is used in fresh state as well as processed form. In fresh state, mainly snow pea and sugar snap are exported due to their

[60] FAOstat

high demand in international market. Processed shelled peas are marketed in three forms: canned, frozen, and dehydrated. Frozen form comprises of 95% of shelled peas which gets exported.
The mature seeds are used as whole or split into dal and put to use in various ways for human consumption. Besides vegetable purposes, it is also grown as a forage crop for cattle and cover crop to prevent soil erosion but mainly for matured seed for human consumption.
India exported 3174.70 MT of Peas (shelled/unshelled, fresh/chilled) worth Rs. 8.89 crores in 2019-20[61].UAE, USA and Nepal are the major importing countries from India.

Table 22: Export of Peas (Dried, shelled, skinned/split from India

	2017-18		2018-19		2019-20	
Country	Qty (MT)	Rs. Lacs	Qty	Rs. Lacs	Qty	Rs. Lacs
UAE	271.30	70.88	23.93	14.21	2,165.06	448.37
USA	14.09	12.81	110.47	89.33	446.10	167.72
Nepal	161.12	53.07	293.55	100.79	132.96	65.80
Egypt	0.00	0.00	0.02	0.02	60.00	35.10
Turkey	258.00	50.22	0.00	0.00	124.00	30.78
Qatar	22.09	13.09	81.61	26.68	65.69	29.87
Nigeria	2.21	1.07	8.51	7.19	20.35	20.53
Italy	0.00	0.00	0.00	0.00	64.00	12.69
Singapore	1.46	0.63	11.89	8.49	17.03	11.89
Total Exported	**4441.46**	**1269.02**	**2069.96**	**802.96**	**3174.70**	**889.08**

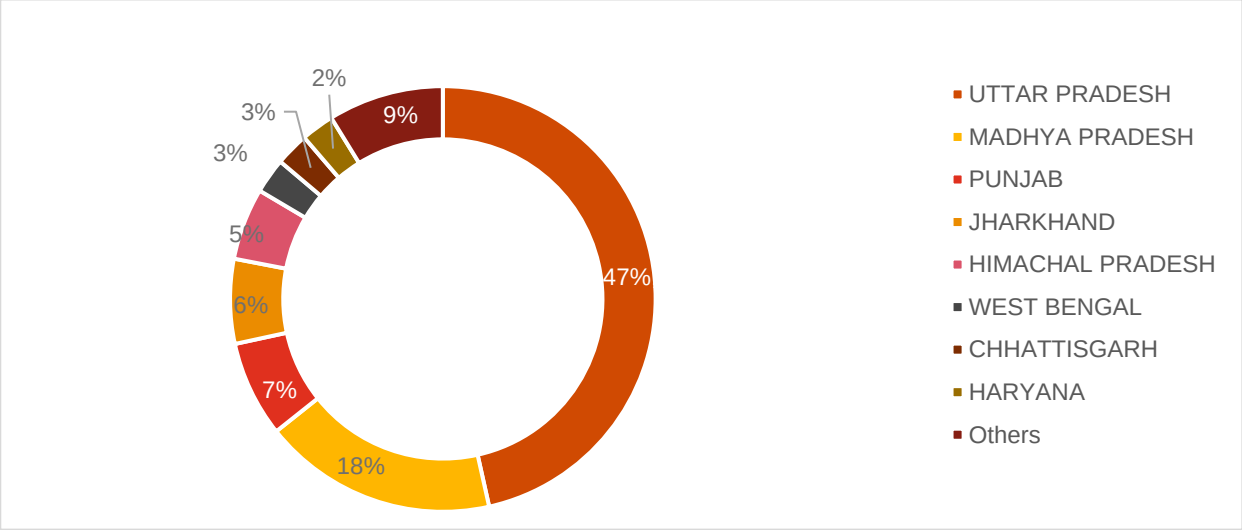
Source: APEDA

4.18.7.1. Clusters of Pea:

4.18.7.1.1. National Clusters

In India an increase in area and production of Peas has been observed in last three years (2015-16 to 2017-18). Area under Peas cultivation increased from 4.98 lakhs ha in 2015-16 to 5.40 lakh ha in 2017-18 whereas production increased from 48.11 lakhs MT in 2015-16 to 54.22 lakhs in 2017-18. In India, Pea is cultivated in almost all the states. Uttar Pradesh is the leading producer in the country contributes 41% of the total area under pea cultivation of India and 47% share in the total production of pea in India followed by Madhya Pradesh with 18% of area and 18 % production. Punjab ranks third in area (7%) and production (7%) in India, 2017-18. In terms of productivity Jharkhand outperforms with a productivity of 22.07 MT/ha followed by Tamil Nadu (15.90 MT/ha) and Jammu & Kashmir (12.93 MT/ha). Punjab in terms of productivity is above national average of 10.03 MT/ha but is far off from the best performing states.

[61] APEDA



Graph 144: State wise production of Peas in 2017-18

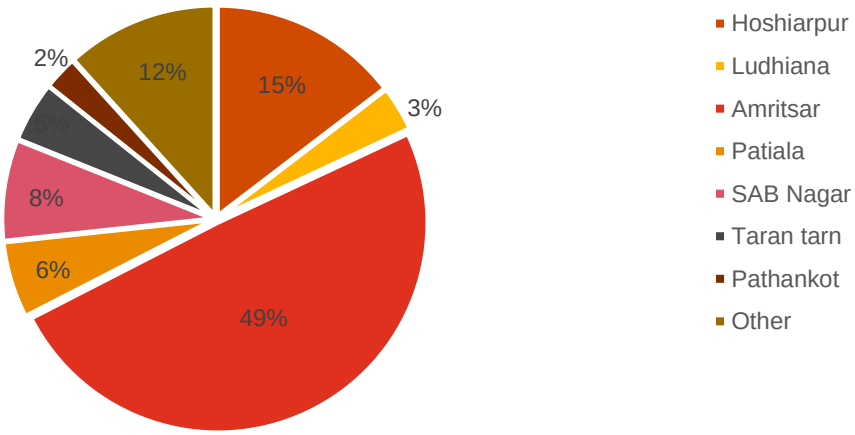
Source: Horticulture statistics at a glance 2018

4.18.7.1.2. Clusters within the state: SBS Nagar

Punjab stands third in Pea production in the country and accounts for about 7% of national production (2017-18). Pea is the second largest grown vegetable in the state and accounts for 14% of the total under vegetable in state (i.e. an area of 39.0 thousand hectare) in 2018-19. The major pea growing districts in the state are **Hoshiarpur, Amritsar, Patiala and SBS Nagar.**

Pea is also a major vegetable crop in the district SBS nagar and cultivated for green pods after the harvesting of Paddy or Maize.

Area under peas cultivation is increasing year on year across the state. State government has planned to increase the area under Pea cultivation from 39 Thousand ha in 2018-19 to 52 Thousand ha by 2023-24[62].



Graph 145: District wise production of Pea in 2018-19

Source: Department of Horticulture, 2018-19

[62] State Focus paper, Department of Horticulture, Government of Punjab

So far, Punjab Agricultural University is working towards varietal improvement of Pea and has developed 13 varieties of which Matar Ageta-6 and Punjab-89 has been widely accepted across India.

4.18.7.1.3. Turnover & employment of the ODOP producers

Currently there is only one pea processing unit in the district. A S Frozen situated at Happowal Road, Banga, SBS Nagar. It has a total processing capacity of 25000 MT. It has been established with an investment of more than INR 15 crores. The unit provides employment to more than 150 people. None of the micro food enterprises are into pea processing in the district

4.18.7.1.4. Socio economic profile of the ODOP producers

None of the micro food enterprises is into pea processing. Small and marginal farmers of the district is into pea production. Processing units like A. S Frozen inter into contract with Pea farmers and provide technical support during the growing season.

4.18.7.1.5. Infrastructure and Technology

Existing pea processing unit in the district has installed IQF for processing Pea. However, cost of IQF will be costly for a micro food enterprise. Blast freezer can be purchased for frozen pea manufacturing which can be purchased within the budget.

4.18.7.1.6. Human resource and skill set

As per the promoter of A.S Frozen, local manpower has required skill set for processing. However, factory manager, food technologist, microbiologists need to be hired from outside.

4.18.7.1.7. Institutional support and support infrastructure

Currently KVK, Nawashar and PAU, Ludhiana is providing training to the producers regarding production of Peas. This institutional set up can be further leveraged for capacity building purpose. Though lack of processing facility in the district is constraint for providing hands on training to the entrepreneurs interested in Peas processing.

4.18.7.2. Packaging

Different packaging material used for Peas packaging are polythene, polypropylene, lug bottles, pouches etc. Following table illustrates use of packaging material based on different value added products of Peas,

Name of packaging material	Products
Polythene bag	Dried peas
Polypropylene	Frozen Peas
Lug bottles	Blanched peas

Source: PMFME Handbook of frozen peas processing

4.18.7.3. Labelling Standards

Proper labeling has to be done to meet statutory requirements of fruit products order, 1955 Prevention of Food Adulteration Act, 1954 and packed commodities (Regulation) Act 1975[63].

4.18.7.4. Value chain actors

Peas value chain comprises of Input suppliers, producers, traders, processors, retailers, and consumers. Different marketing channels existing in the district is illustrated below;

[63] Model Detailed Project Report on Frozen Processing Unit, IIFPT

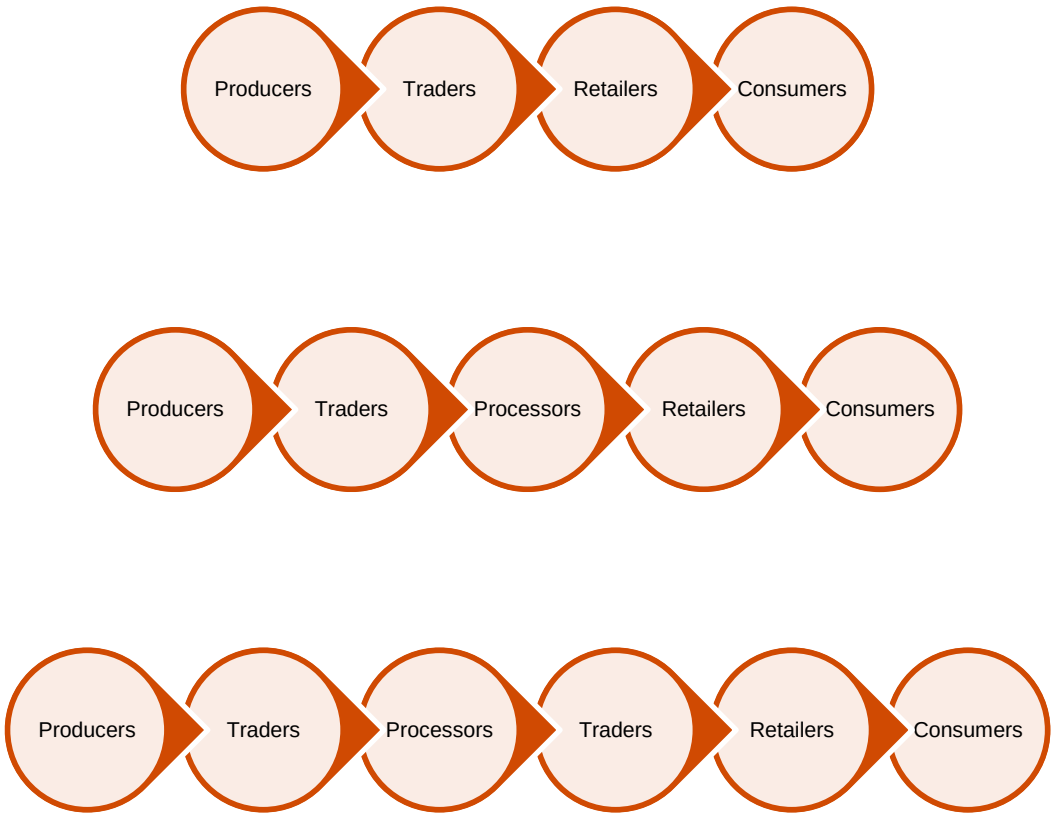


Figure 14: Marketing channels of Peas

Different stakeholders informed that about 90% of early season produce is sold in the distant markets across nation. Peak season harvest is only consumed within the district. Farmers sell fresh peas to the vegetable traders in the mandi, who further sell it to aggregators in the distant markets.

Processors sell the produce directly to the retail stores or through distributors etc. Though currently only one processing unit is functional in the district.

4.18.7.5. Value-added products

Tender pea with high sugar content is suitable for processing. The tenderometer reading is used for measuring quality of the processing of peas. For freezing peas reading should be about 100 and for canning they can be slightly firmer at 120. Freezing peas varieties are darker green due to the presence of green color in the seed coat. The seeds are also graded by floating on a 5% brine solution – the sinkers are taken for canning while the floaters are used for freezing.

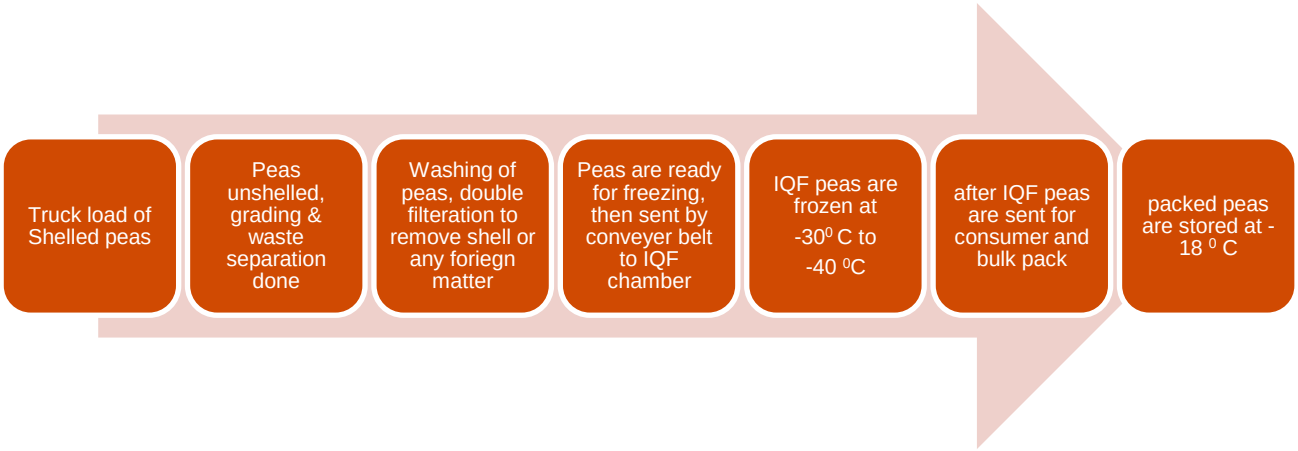


Figure 15: Process for IQF Peas

Increasing customer desire for convenience foods implicitly favors increasing demand for frozen items, as they require less time and effort than cooking from scratch. The processed food market is driven by the greater need for convenience due to the busy lifestyles of consumers. That, in particular, raises the market for frozen goods. Rising disposable income is also one of those reasons that have a major effect on the development of the frozen food industry as it increases the purchasing power of customers. The size of the frozen food industry in 2019 was priced at $291.8 billion and is expected to hit $404.8 billion by 2027, with a CAGR of 4.2 percent between 2020 and 2027. Frozen food is described as food products that are frozen at low temperatures and are used for a long period of time. Different food products, including ready meals, vegetables & fruits, rice, meat & fish, fish, and soup, are part of the product market. Fresh peas are available only during the winter season but are generally required in all seasons. Also, their harvest is limited to certain states. This gap between demand and supply is being managed by frozen peas available in the Indian market.

Frozen Peas:

Figure 16: Process flow for frozen peas

4.18.7.6. Major Issues faced by micro food processing enterprises of the ODOP

Currently there is only one pea processing unit in the district. During our discussion with processing unit's promoter, they informed price volatility, highly perishability of the raw material and inconsistent supply are the major constraints faced by them.

4.18.7.7. SWOT Analysis

As mentioned earlier, peas has been selected as ODOP for the SBS Nagar district. Following is the SWOT analysis for the peas.

SWOT Analysis

Strengths: • High production volume. • Availability of large market for frozen peas. • Continues increase in area under cultivation for the peas.	**Weakness:** • Fall in prices during glut season. • Lack of efficient marketing channel for the remunerative marketing of the produce • Small scale of production at individual level.
Opportunities: • Untapped potential for frozen processed products. • Formation of collectives like FPCs for collective marketing.	**Threats:** • Lower share of producer's share in farmer's rupees. • Increasing cost of production

4.18.7.8. Identified gap

Various gaps were identified at the firm and cluster level, where work needs to be done in order to increase the scale of activities for ODOP. Following are the major firm level and district level gaps identified through stakeholder consultations.

S. No	Sectors	Gaps	Recommendations
1	Skill training needs	Lack of technical know-how for pea processing	Training and capacity building on various value added products processing with the help of SLTIs, KVKs, DLTIs etc.
2	Manufacturing practices	No processing unit for the ODOP is present in the district.	Training and capacity building on better manufacturing of value added products of pea with the help of SLTIs, KVKs, DLTIs etc.
3	Technologies	Unawareness about technologies available for pea processing	Awareness creation about technologies available through establishment of incubation centre for pea processing. This will also enhance skills of entrepreneurs along with providing hands on training to the entrepreneurs through learning by doing.

Cluster/district level

Infrastructure	Up-gradation proposals
A) Public Infra	SBS Nagar district has good public infrastructure in terms of connectivity and urban infrastructure.
B) Common facilities	Common infrastructure center at SBS Nagar can be established to help the entrepreneurs to take up pea processing during peak season. This will help them to overcome the distress sale of the produce.

C) Testing facilities	Testing facilities are unavailable, and establishment of testing lab can help in improving the standards through better access to testing. Individual micro enterprises should also be encouraged to set up food testing lab with basic equipment.
D) Common Branding and Marketing	After establishment of sizeable number of processing units in the district, a common brand can be established under the branding component of the PM FME scheme to help the micro enterprises with better marketing access. It can help them in realizing better price for their products.

4.18.7.9. Way Forward: Areas of interventions & suggestions

4.18.7.9.1. Establishment of common facilities

Peas are highly perishable in nature with short shelf life; hence it requires cold chain facility. A common infrastructure facility with cold storage, integrated pack house and frozen pea processing facility can be planned. As per our interaction with different stakeholders, common facility will promote processing of peas in the district, reduce post-harvest losses and help farmers to fetch better prices for the produce

4.18.7.9.2. Training and capacity building of the enterprises under the scheme

During interaction with Pea growers in the district it was found that they lack skills pertaining to pea processing. Pea growers can be trained about value added products of Peas processing practices, technologies available, marketing & branding etc. Training and capacity building can be conducted with the help of SLTI, DLTIs, KVK etc. to ensure wider reach.

4.18.7.9.3. Support through the individual enterprise subsidy component

PM FME scheme has the component of individual application, where the processors can be provided with the benefit of credit linked subsidy to help them in upgradation of their units. Farmers should be encouraged to set up Peas processing unit and take up the benefits under the individual component of the scheme through awareness creation.

4.18.7.9.4. Support in branding and marketing

After substantial number of micro food enterprises have been set up and gone into commercial production in the district, then a common marketing and branding for the Peas processed products can be proposed.

Suggested interventions

Particulars	Gaps/ Problems	Suggested Interventions	Intervention Agencies	Actions under PMFME
Production	• Production of varieties suitable for processing	• Intended processors can lock his area/farmers for the desired varieties through formal/informal buying agreement. District department can do extension work	• Directorate of Horticulture	• Technical Support District departme nt of Horticultu re • Area expansio n of pea cultivation in the district

		on selection of variety. Private Seed Companies can be also roped in. Department can do pilot study on the suitability of agro climatic condition for growing such varieties.		
Farm Level	• Absence of sorting/ grading and limited product handling facility • Absence of storage infrastructure • Wastage is high	• Creation of farm level primary processing centres with sorting, grading, cleaning, packaging and transportation facilities • Creation of Common Processing Centres in production clusters	• Individual entrepreneurs • Farmers • SHGs • Farmer Producer Companies • SRLM • Existing Food Processing Units	• Assistance in availing benefits of individual units • Assistance in availing benefits of group enterprises
Storage infrastructure	• No packhouses available • Very few cold storages	• Setting up of primary processing centres • Setting up of cold chain infrastructure • Primary Processing Centres with storage facilities	• Individual entrepreneurs • Farmers • SHGs • Farmer Producer Companies • SRLM • Existing Food Processing Units • APEDA	• Assistance in availing benefits of individual units • Assistance in availing benefits of group enterprises
Processing units	• No pea processing units available in the district • Market is predominately for fresh fruit	• Individual micro enterprises may be set-up • Frozen units • Strategic promotional	• Individual entrepreneurs • Farmers • SHGs	• Assistance in availing benefits of

		activities to mobilise local investors/farmers • Setting up of Common Incubation Facility	• Farmer Producer Companies • Existing Food Processing Units • KVKs • Private Institutions	PMFME Scheme
Capacity Building	• Processing based skills of farmers is lacking • Entrepreneurship Skill is also lacking • No awareness about GMP, GHP, licensing, statutory clearances	• Development of customized training curriculum • Organising beneficiary training	• State Level Technical Institution, PAU, Ludhiana • NIFTEM • DRPs	• Training Fund under PMFME Scheme
Marketing & Branding	• No concrete knowledge on market enhancement and processes/ techniques to follow • No big buyers are present • Packaging not been focused • Mostly local market covered	• Development of marketing and branding plan/ reports • Organising buyer-seller meet • Development of packhouses with modern packaging facilities	• SPMU • SLTI • Farmers/ Investors/ SRLM	• Availing benefits of marketing and branding funds under scheme

4.19. Sangrur

4.19.1. Socio economic profile

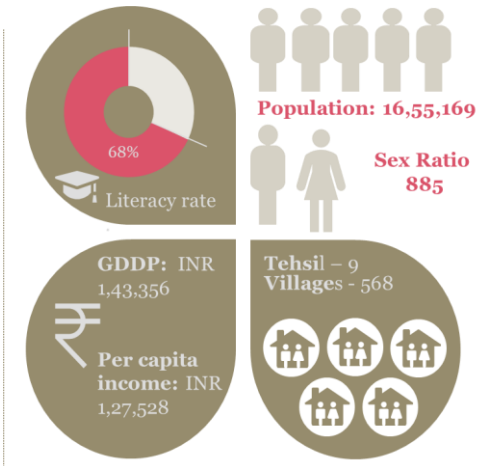
Sangrur district was formed in 1948. Prior to that it formed part of the erstwhile States of Patiala, Nabha and Jind, which collectively were known as Phulkian States. It is surrounded by the Ludhiana district in the north, Patiala in the east, Barnala and Mansa in the west and district Jind (Haryana state) lies to its south.

Sangrur is the district headquarters town and is located at a distance of 130 km from Chandigarh. The district is well connected with rail and road with the all parts of the state. The district is comprising of nine Ahmedgarh, Bhawanigarh, Dhuri, Dirba, Lehra gaga, Malerkotla, Moonak, Sangrur, and Sunam. The district has ten blocks namely Andana at moonak, Bhawanigarh, Dhuri, Dirba, Lehragaga, Malerkotla I, Malerkotla II, Sangrur, Sherpur, and Sunam. The district has 568 villages

The district Gross District Domestic Product (GDDP) and per capita income is above than the state average.

4.19.2. Demographic profile

According to the 2011 census, Sangrur district has a population of 16,55,169 of which male and female population were 53.05% and 46.95% respectively. It accounts 6% of the state population. Out of the total population of the district, 68.8% is residing in the rural and 31.2% in urban area. The district has recorded a decadal growth rate of 12.3% which is lower than that of state average. The district has density of 457 persons per sq. km. The district has a sex ratio of 885 females per 1000 males and the literacy rate of the district was 68%.



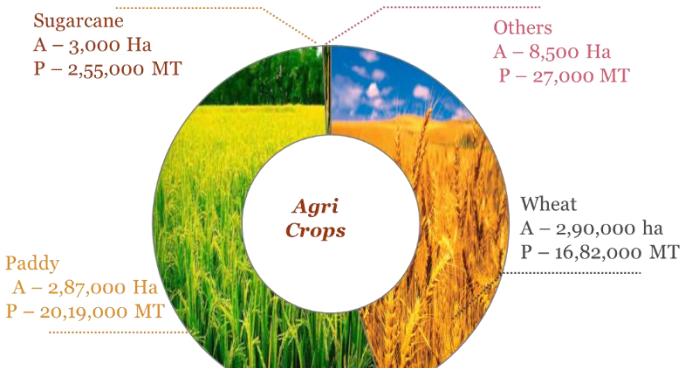
4.19.3. Climate and Rainfall

The climate of the district is characterized by the dryness of the air an intensely hot summer and cold winter. The temperature in the summer touches 47°C and scorching dust laden winds, commonly known as loo, blow during the hot season. January being the coldest and June the hottest months. The normal annual rainfall of the district is 558 mm about 75% of the rainfall experienced in the monsoon period. July and August are the wettest months.

4.19.4. Agriculture profile

The geographical area of the district is the second highest, after district Ludhiana. Out of the total geographical area of the district, the net sown area is over 87%. The district has the cropping intensity of 199%. The topography is that of an alluvial plain, marked by flatness featurelessness.

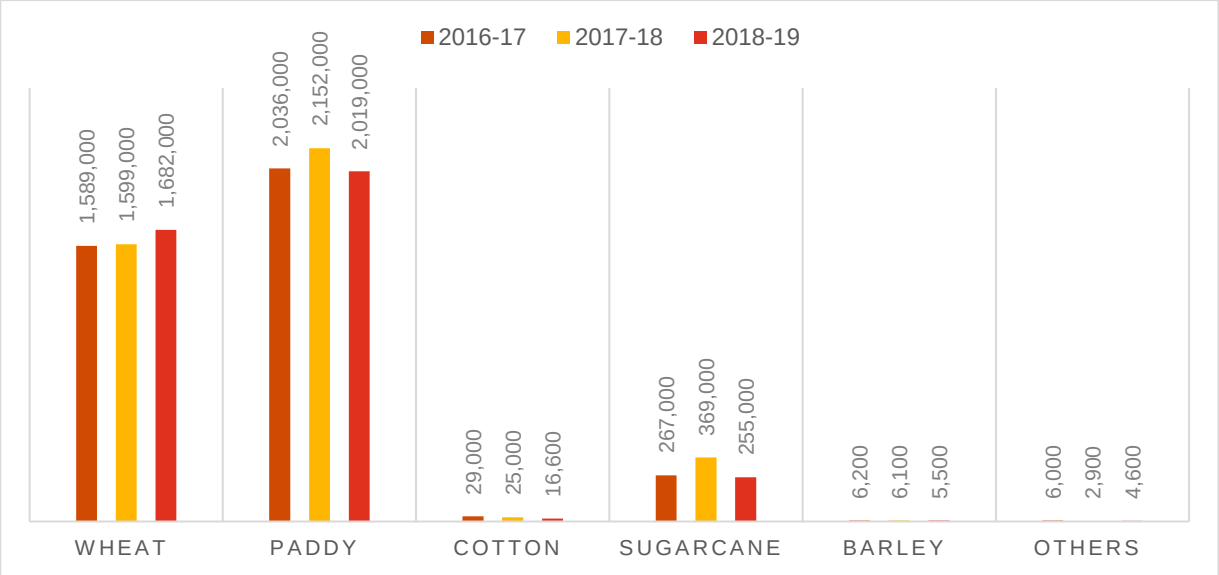
The district Sangrur is the highest producer of wheat and paddy amongst all districts in the state. Wheat and paddy are the main Rabi and kharif crops of the district. The other major crops of the district is sugarcane and also grows rabi oilseed (sarson), Kharif pulses etc.



Graph 146: Major Field crops grown in district Sangrur (2018-19)

Source: Department of Agriculture, Govt. of Punjab

Production of wheat, paddy, cotton ,sugarcane and barley has shown erratic trend over last three years.



Graph 147:Production trends of agricultural crops in Sangrur district

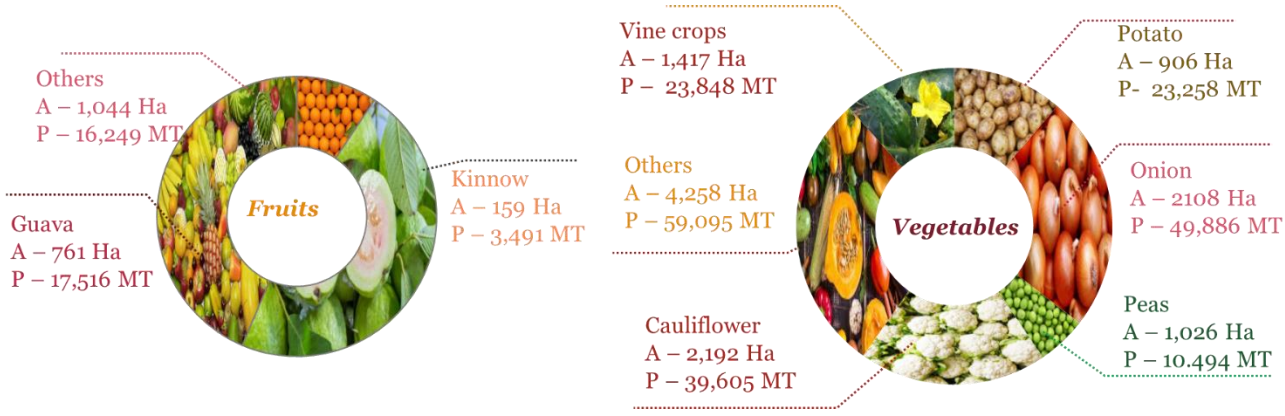
Source: Department of Agriculture, Govt. of Punjab

4.19.5. Horticulture profile

The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc. and that too substantial quantities. Overall, there is cumulative growth of over 22% in the area under vegetables in last four years (from 2016-17 to 2019-20).

Out of all vegetables in the district, maximum area is under cauliflower. The district is the second highest producer of Onion.

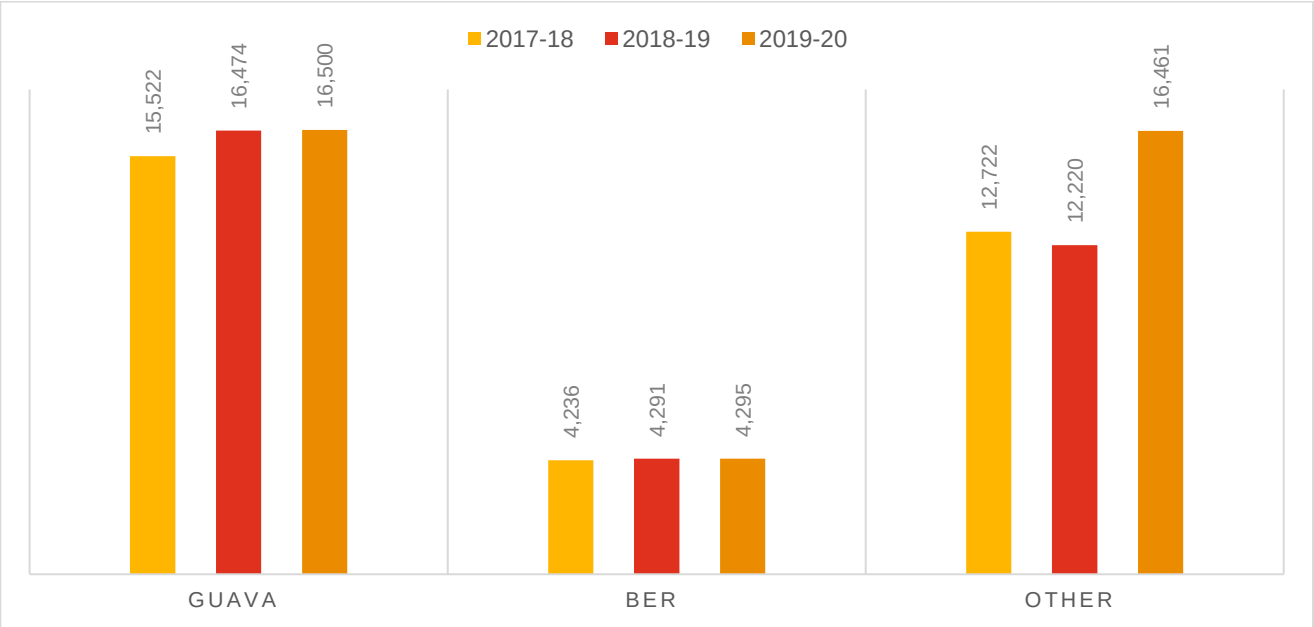
The district produces a wide variety of fruits like guava, ber, lime, kinnow, peach etc. During the period from 2016-17 to 2019-20, the area under fruit crops is reported a cumulative growth of 22%



Graph 148: Major fruits and vegetables grown in district Sangrur (2019-20)

Production trend-Fruits

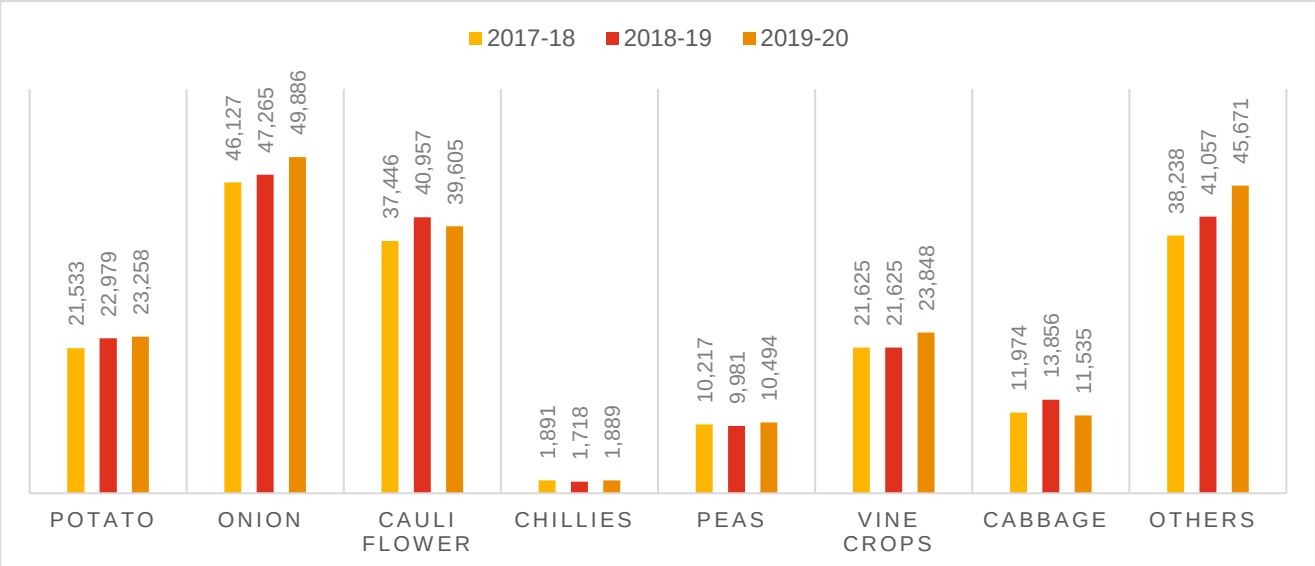
Production of all fruit crops has shown consistent trend over last three years.



Graph 149: Production trend of fruits in Sangrur district (MT)

Production trend-Vegetables

Production of most of the vegetables has shown increasing trend over last three years.

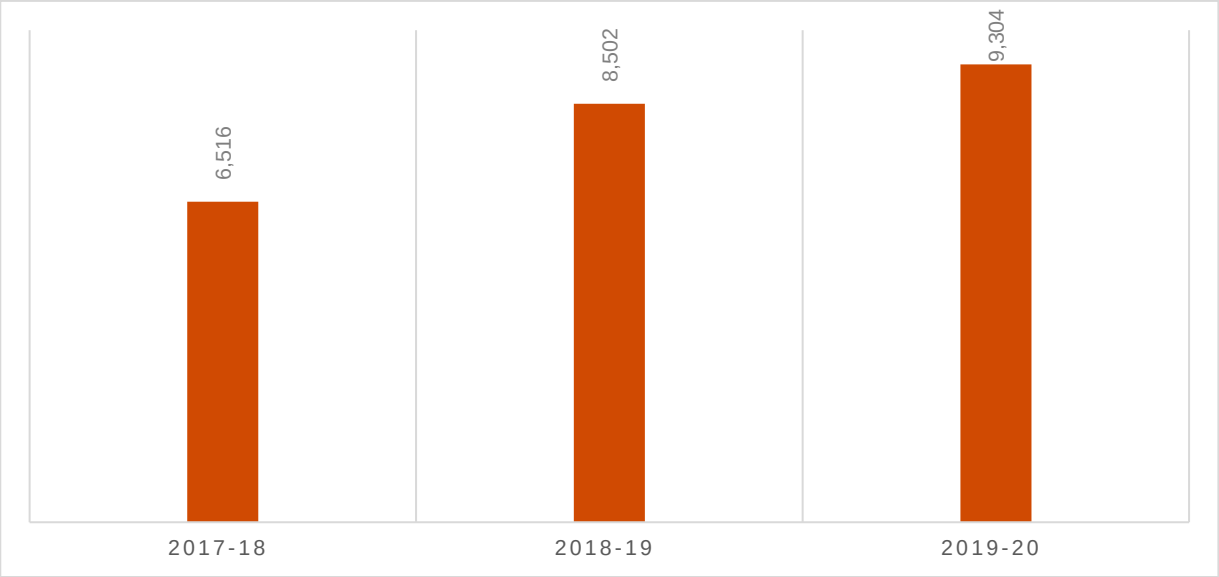


Graph 150: Production trends of vegetable crops in Sangrur district

4.19.6. Allied activities

Production trend- Fish

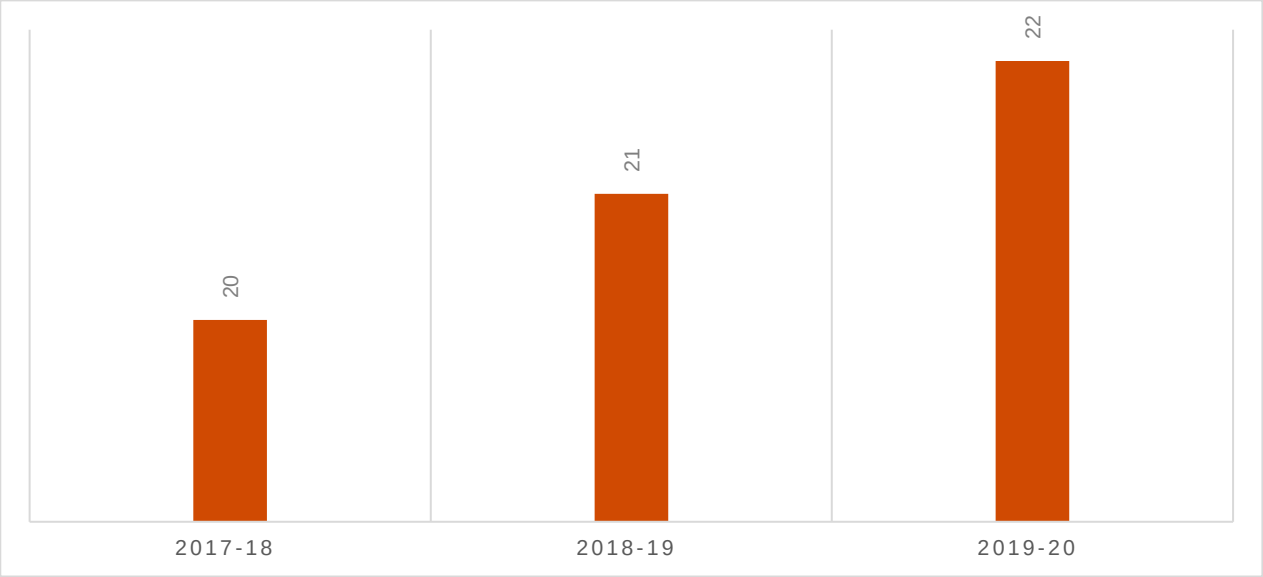
The production of fish in the district has shown spectacular cumulative growth of 43% in last three years with 9,304 MT during 2019-20. The consumption of fish is also one of the highest here.



Graph 151: Production trend of fish in Sangrur district (MT)

Production trend- Milk

The district Jalandhar produces milk at 21.81 lakh litres per day. There has been consistent growth in the production of milk in the district. It is amongst the largest producer of milk districts of the state. During 2019-20, it produced 21.81 lakh litre/day of milk, a cumulative growth of 8% in last three years.



Graph 152: Production trend of Milk in Sangrur (LLPD)

4.19.7. Industrial profile

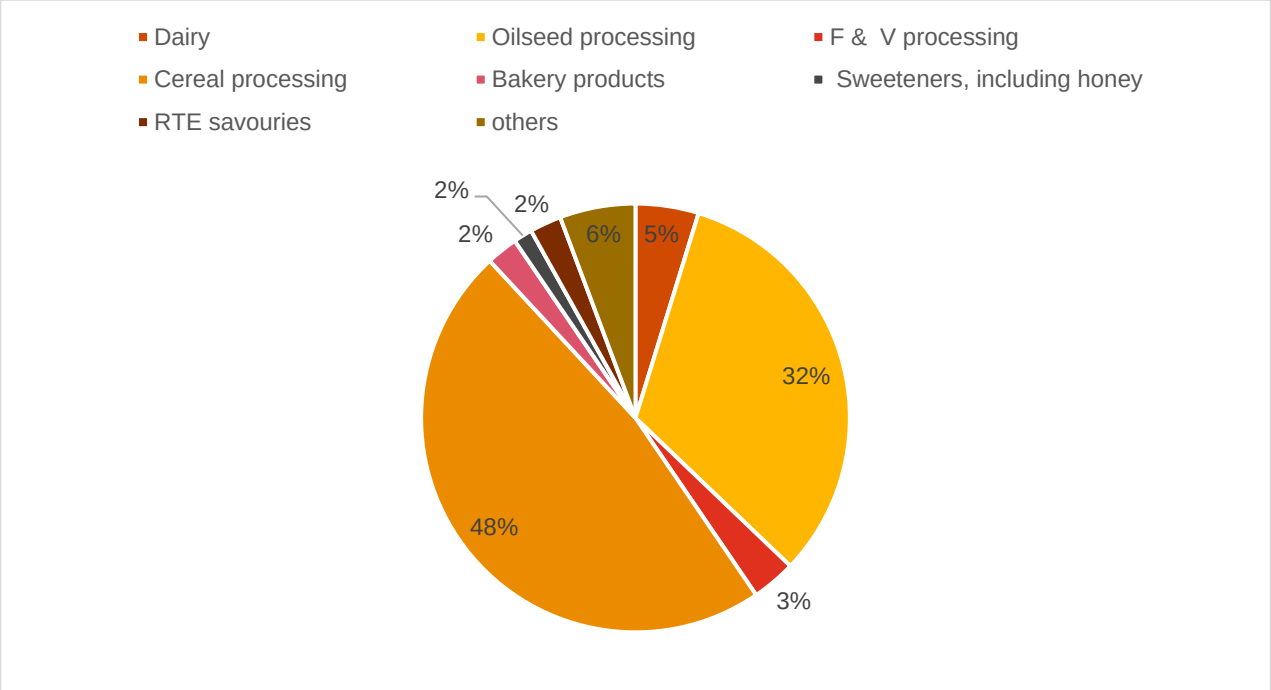
There were 1773 registered Micro Small enterprises in the district and 7 registered medium and large enterprises providing employment to 6928 and 11804 persons respectively, as per FY 2014-15.

Table 23: Industry in Sangrur

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	1773
2	Registered Medium & Large Units	No.	7
3	Employment in MSE Sector	No.	6928
4	Employment in Large and Medium Industries	No.	11804
5	No. of Industrial Areas	No.	Nil
6	Turnover of MSE Sector	Rs. Lakh	53373.26
7	Turnover of Large & Medium Sector	Rs. Lakh	463835.55

Major food processing units in the district;

- The Sangrur Distt. Co-operative Milk Producers' Union Limited, Sangrur: There are 410 functional Milk Producers' Co-operative Societies & 165 Nos. of dairy farmers are supplying 140000 ltrs.of milk to union per day. Fresh milk is procured directly from producers through village level societies two times in a day morning & evening. The major quantity of milk being purchased at this plant is used to manufacture SMP & Ghee apart from this plant is supplying liquid packed milk in the cities & towns situated in the milkshed area of this union to the consumers. Further fresh milk products Paneer, Curd, Plain Lassi, Spicy lassi, Kheer & milk cake etc. are also manufactured.



Graph 153: Spread of different micro food enterprises in the district

As per stakeholder interaction, about 48% of the micro food enterprises are into cereal processing, 32% into oilseeds processing, 5% into dairy processing, 3% into fruits & vegetable processing.

. There were about 400 wheat flour mills in the district out of which 8-10 are mini semi-automatic types, and more than 400 rice mills of average capacity of 2 MT/hr. The district has 4 to 5 medium sized solvent extraction units.

there are about 15 small and micro enterprises processing cotton seed & mustard seed using expellers to manufacture crude edible oil and mustard oil.
There is no fruits and vegetable processing unit in the organised sector in the district. However, there are number of micro enterprises and FPOs engaged in the production of a range of products like jaggery, pickles, chutney, jam, squash etc.
The district has three to four medium sized milk processing plants manufacturing desi ghee, skimmed milk powder, curd, butter, lassi, etc. There are over 400 dairy farms processing marginal quantities of milk ranging from 500 litre to 2,000 litre to manufacture paneer, curd, sweet meat, lassi, etc. for local consumption. There are over 350 bakeries and savouries units in the district.

4.19.8. ODOP

India contributes only 2% to the global mushroom production. Mushroom production in India has grown at a compound annual growth of 23% from 2013-14 to 2017-18. Mushroom commercial production and distribution in India has increased manifold in the recent past due to considerable shift in the lifestyles and diet habits of people. Mushrooms is excellent source of protein, vitamin D and minerals (copper, zinc, potassium, iron and manganese). Globally, different kinds of mushrooms are grown, currently shitake, oyster, wood ear and button mushroom contribute 22%, 19%, 18% and 15% respectively[64].In India, Button mushroom is grown widely and accounts for 73% of total national production followed by oyster mushroom which contributes 16% of total national production[65].

4.19.8.1. Clusters of Mushroom

4.19.8.1.1. National Clusters

Total production of Mushroom stood at 4.87 lakh MT in FY 17-18. Uttar Pradesh is the largest producer of mushroom in India. Punjab, Haryana, Himachal Pradesh, Rajasthan, and Jammu Kashmir are other major Mushroom producing states. Sonipat, Haryana and Gorakhpur, Uttar Pradesh are major Mushroom growing cluster in India. Button mushroom are grown in under controlled temperature throughout the year and seasonal in winter season in North western part of India. Oyster, milky, paddy straw mushroom is cultivated in other region of India. With the rise of Mushroom production, spawning and compost units are growing across India.

4.19.8.1.2. Clusters within the state: Sangrur

Mushroom production in Punjab was 9420 MT in FY 18-19, the state contributes 5% to the national production.[66] Sangrur, Patiala, Ferozpur, Ludhiana, Jalandhar, Kapurthala, Amritsar, Hoshiarpur are major Mushroom growing districts in the state. Mushroom production has increased at compound annual growth rate of 34% from 228.25 MT in 2017-18 to 410.80 MT in 2019-20[67]. As per the surveyed farmers, button mushroom is grown in the month of October to March. Compost production starts one month before mushroom growing. There are few units in different districts which have temperature controlled facility to grow Mushroom round the year. Some of the farmers also grow Oyster Mushroom from September to April.

4.19.8.1.3. Turnover & employment of the ODOP producers

Currently there is no mushroom processing unit in the district

4.19.8.1.4. Socio economic profile of the ODOP producers

During our interaction with Mushroom growers in the district it was found that

[64] Singh et al., 2017
[65] ICAR-Directorate of Mushroom Research, Solan
[66] Status Horticulture, Punjab Report of Department of Horticulture
[67] Department of Horticulture, Govt. of Punjab

4.19.8.1.5. Infrastructure and Technology

Currently there is no mushroom processing unit in the district.

4.19.8.1.6. Human resource and skill set

In the absence of processing unit in the district, technical know-how for Mushroom processing is lacking. Though some of the producers of Mushroom have and idea about value added products being manufactured from Mushroom. As they informed during our interaction that in training regarding mushroom production in PAU, Ludhiana they have been informed about value added products as well. But they were unaware about the processing technologies involved and process flow of value addition. Most of the respondents have shown interest in learning about manufacturing technologies and setting up units themselves post hands on training.

4.19.8.1.7. Institutional support and support infrastructure

Currently KVK, Sangrur and PAU, Ludhiana is providing training to the producers regarding production of Mushroom. This institutional set up can be further leveraged for capacity building purpose. Though lack of processing facility in the district is constraint for providing hands on training to the entrepreneurs interested in mushroom processing.

Department of Horticulture is supporting producers and compost manufacturers under MIDH scheme. One of the compost manufacturers we interacted has availed subsidy under MIDH for compost manufacturing. He is supplying compost across Punjab. This is creating enabling infrastructure for overall Mushroom value chain. One of the producers has recently established temperature controlled mushroom production unit and has applied for subsidy under MIDH.

4.19.8.2. Packaging

Different packaging material used for Mushroom packaging are polythene, polypropylene, lug bottles, laminated pouches, PVC wrapped trays, plastic jars, and tin cans. Following table illustrates use of packaging material based on different value added products of mushroom.

Name of packaging material	Mushroom product
Polythene bag	Dried mushroom and mushroom powder
Polypropylene	Mushroom Candy, Mushroom Soup Powder, Mushroom Powder, Dried Mushroom, Mushroom Chips
Lug bottles	Mushroom pickles
PET jars	Mushroom biscuits Mushroom candies
PVC wrapped trays	Mushroom nuggets
Laminated pouches	Mushroom curry
Tin Cans	Canned Mushroom

Source: PMFME Handbook of canned mushroom processing

4.19.8.3. Labelling Standards

Proper labeling has to be done to meet statutory requirements of fruit products order, 1955 Prevention of Food Adulteration Act, 1954 and packed commodities (Regulation) Act 1975[68].

4.19.8.4. Value chain actors

Mushroom value chain comprises of Input suppliers, producers, traders, processors, Retailers and consumers. Different marketing channels existing in the district is illustrated below;

[68] Model Detailed Project Report on Canned Mushroom Unit, IIFPT

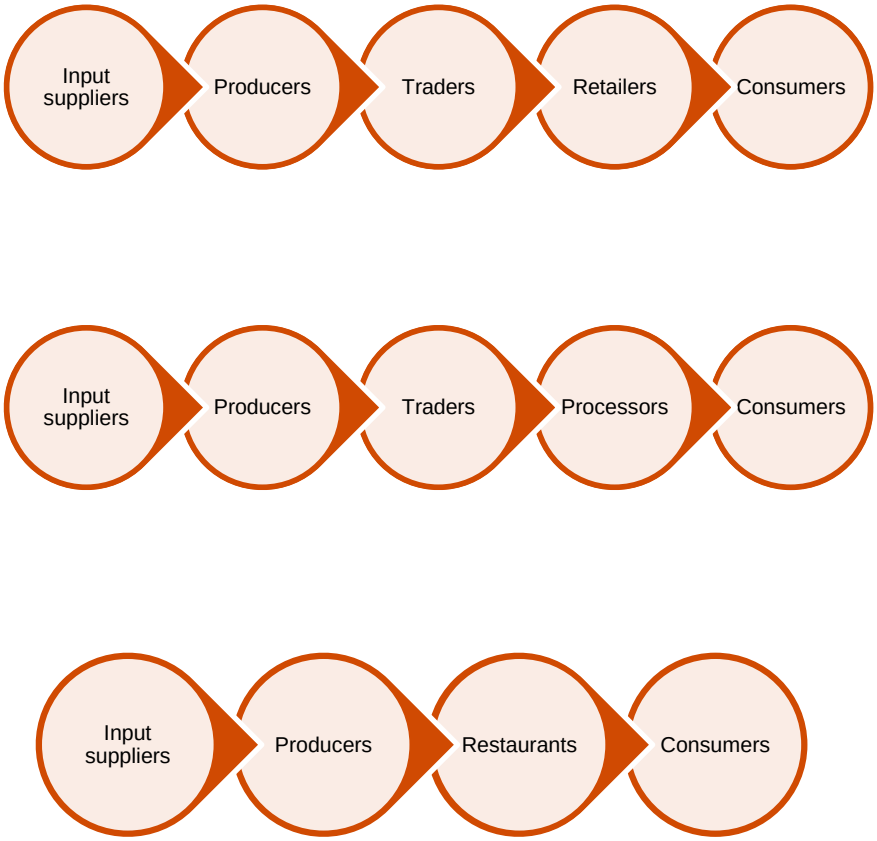


Figure 17: Marketing channels of Mushroom

Compost manufacturers: Compost manufacturers are suppliers of compost for production of mushroom. In Sangrur district there are number of compost manufacturers who supply compost to growth of Mushroom. Compost manufacturing starts one month before spawn sowing. Some of the producers in the district prepare compost at their own farm. Compost is prepared from agro waste like Wheat bran and some additives like ammonium sulphate of calcium ammonium nitrate, urea, gypsum etc. Producers informed that the process of compost manufacturing involves wetting of straw, stacking of wetted straw, mixing of ingredients, pile preparation and pasteurizing of compost. The whole process of compost preparation takes 25 to 30 days. Some of the compost units have been supported by National Horticulture Board under MIDH.

Spawn suppliers: Spawn suppliers play pivotal role in supply of quality spawn to the Mushroom growers. Some of the compost manufacturer also supply spawn along with compost to the mushroom growers. Mushroom producers informed that compost manufacturers of the district are providing compost along with spawn. Some of the growers purchase spawn from Sonipat, Haryana and Directorate of Mushroom Research, Solan, Himachal Pradesh.

Producers: Producers pack freshly harvested mushrooms in 200 gm packs in 25 gauge polythene bags. Packaging in polythene increases shelf life by 3-5 days as respiratory rate is reduced. They sell the produce to the vegetable traders in the mandi. On some occasion they supply the produce to restaurants or marriage halls. Most of the producers informed that they sell the produce in Sangrur mandi while few sell it to traders in Ludhiana as well. In peak season when prices fall in the mandis producers sell to processors. Bajwa Mushroom, Kurukshetra is the major buyer of mushroom from Sangrur farmers.

Traders: Traders sell the produce to aggregators or traders in cities like Chandigarh or Delhi NCR in bulk quantity.

Processors: Sangrur district currently has no processing unit for Mushroom and thus processors from Haryana buy Mushroom from producers and traders here in peak season.

Retailers: Retailers buy fresh Mushroom from wholesalers/traders in the nearby mandis. They further sell it to the consumers.

4.19.8.5. Market demand of value-added products

In India Mushroom is majorly consumed fresh, as its highly perishable in nature high temperature results in browning. Major value added products of Mushroom are canned, dried, pickled, frozen, powder etc. These are further used for manufacturing of soups, noodles, pasta, biscuits, ketchups, functional foods etc. Some of the common value added products processes are discussed below.

Freeze-drying: By this method shelf life of Mushroom is extended up to 3-4 months. Sliced Mushrooms are immersed in 0.05% sodium meta bisulphite and 2% common salt. Further mushroom is blanched and subsequently cooled. Freezing takes place at -12 degree Celsius and stored at minus 20 degree Celsius.

Dehydration: Dehydration of Mushroom involves pre-treatment, drying and storage. Mushroom is first cleaned and blanched in boiling water and immersed in cold water. Mushroom is dripped in water containing 0.2% potassium meta bisulphite and 1% citric acid. Drying can be done by either sun drying, flow dryer and vacuum drying.

Canning: Canning is commonly used preservation method of mushroom especially button mushroom. About 50% of the processed Mushroom is canned. Mushroom are dipped in salt solution consisting of 2% common salt, 2% sugar and 0.3% citric acid and filled in cans. Cans are further sterilized

Market size of canned mushroom in the global grade is estimated at USD 1 billion in 2018. Overall canned food market is growing at a CAGR of 4%[69]. As per our discussion with some exporters, currently, China, Taiwan and Indonesia are leading manufacturers of processed mushroom in the world. Major importing countries of canned Mushroom are Germany, USA, Canada, Japan etc.

4.19.8.6. Major Issues faced by micro food processing enterprises of the ODOP

Currently there is no mushroom processing unit in the district. During our discussion with processing units of other states, they informed price volatility, highly perishability of the raw material and inconsistent supply are the major constraints faced by them.

4.19.8.7. Product cost analysis

Product cost analysis for canned mushroom and dehydrated mushroom has been done based on inputs from scientists at KVK, Sangrur.

	Canned Mushroom	Dehydrated Mushroom
Items	Amount (INR)	Amount (INR)
Raw Material	45-50 per kg	45-50 per kg
Operational cost	30-32 per kg	60-70 per kg
Labor & other charges	10-12 per kg	40-45 per kg
Packaging, Transportation and marketing cost	15-16 per kg	28-30 per kg
Total production cost	95-120 per kg	260-280 per kg
Price at wholesaler level	180-200 per kg	340-355 per kg
Retail price	260-280 per kg	400-450 per kg

[69] Model Detailed Project Report on Canned Mushroom Unit, IIFPT

4.19.8.8. SWOT Analysis

As mentioned earlier, Mushroom has been selected as ODOP for the Sangrur district. Following is the SWOT analysis for the Mushroom

SWOT Analysis	
Strengths: • Huge agro waste available for compost purpose • Suitable climatic condition for mushroom cultivation • High marketable surplus • Surge in demand of Mushroom • Close vicinity to the consuming markets	**Weakness:** • Lack of pre-cooling, storage, and processing for Mushroom • High electricity cost for controlled temperature set up • Lack of proper marketing facility • Non availability of quality spawn in the close vicinity
Opportunities: • Upsurge in demand due to health conscious population • Potential for export of the product. • Tapping the large domestic market for sale in other states. • Setting up of processing unit for manufacturing of functional foods from Mushroom	**Threats:** • Entry of large players in mushroom processing in nearby states • Ensuring the adherence to hygiene and regulatory requirements

4.19.8.9. Identified gap

Various gaps were identified at the firm and cluster level, where work needs to be done in order to increase the scale of activities for ODOP. Following are the major firm level and district level gaps identified through stakeholder consultations.

S. No	Sectors	Gaps	Recommendations
1	Skill training needs	Lack of technical know-how for Mushroom processing	Training and capacity building on various value added products processing with the help of SLTIs, KVKs, DLTIs etc.
2	Manufacturing practices	No processing unit for the ODOP is present in the district.	Training and capacity building on better manufacturing of value added products of mushroom with the help of SLTIs, KVKs, DLTIs etc.
3	Technologies	Unawareness about technologies available for Mushroom processing	Awareness creation about technologies available through establishment of incubation centre for Mushroom processing. This will also enhance skills of entrepreneurs along with providing hands on training to the entrepreneurs through learning by doing.

Cluster/district level

Infrastructure	Up-gradation proposals
A) Public Infra	Sangrur district has good public infrastructure in terms of connectivity and urban infrastructure.
B) Common facilities	Common incubation center at Sangrur can be established to help the entrepreneurs to take up mushroom processing during peak season.
C) Testing facilities	Testing facilities are unavailable, and establishment of testing lab can help in improving the standards through better access to testing. Individual micro enterprises should also be encouraged to set up food testing lab with basic equipment.
D) Common Branding and Marketing	After establishment of sizeable number of processing units in the district, a common brand can be established under the branding component of the PM FME scheme to help the micro enterprises with better marketing access. It can help them in realizing better price for their products.

4.19.8.10. Way Forward: Areas of interventions & suggestions

4.19.8.10.1. Establishment of incubation centre

Sangrur district has a good production base of Mushroom. Most of the farmers produces seasonal mushroom and sell it in nearby mandis or to processor in Kurukshetra district of Haryana. There is no processing unit in the district for Mushroom. Some progressive farmers have visited Bajwa Mushroom and Randhawa Mushroom out of interest. Hence, this creates a dire need to create an incubation centre for progressive farmers of the district who are ready to become entrepreneurs. Incubation centre with 3-4 different mushroom processing lines like canning, dehydration etc. This will help in providing hands on training to entrepreneurs regarding processing technologies. In this incubation centre entrepreneurs can bring in mushroom from their farm and get it processed here and fetch better prices for their produce through value addition. This will help farmers to overcome price crash in glut season.

4.19.8.10.2. Training and capacity building of the enterprises under the scheme

During interaction with Mushroom growers in the district it was found that they lack skills pertaining to mushroom processing. Mushroom growers can be trained about value added products of Mushroom, manufacturing practices, technologies available, marketing & branding etc. Training and capacity building can be conducted with the help of SLTI, DLTIs, KVK etc. to ensure wider reach.

4.19.8.10.3. Support through the individual enterprise subsidy component

PM FME scheme has the component of individual application, where the processors can be provided with the benefit of credit linked subsidy to help them in upgradation of their units. Farmers should be encouraged to set up mushroom processing unit and take up the benefits under the individual component of the scheme through awareness creation.

4.19.8.10.4. Support in branding and marketing

After substantial number of micro food enterprises have been set up and gone into commercial production in the district, then a common marketing and branding for the Mushroom processed products can be proposed.

4.20. Bathinda

4.20.1. Socio economic profile

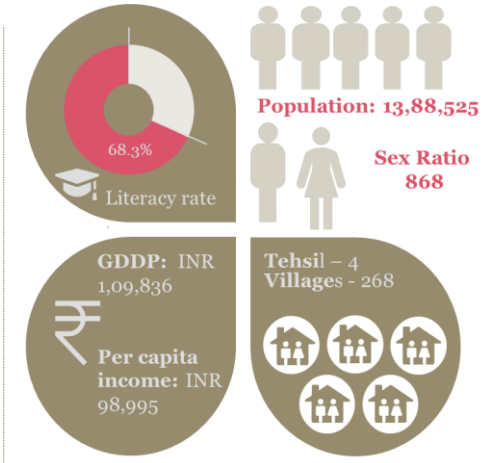
District Bathinda is situated in the Southern part of Punjab State in the heart of Malwa region.The district is surrounded with district Sirsa of Haryana State in the South; district Barnala and district Mansa in the East, district Moga in the North and district Faridkot and district Sri Muktsar Sahib in the North-West.

Headquarter of the district is located at Bathinda town. The district is divided into the 4 tehsils name as Bathinda, Rampura Phul, Maur and Talwandi Sabo. These tehsils are further divided into the nine blocks of Bathinda, Sangat, Nathana, Rampura, Phul, Maur, Balianwali, Bhagta Bhai ka and Talwandi Sabo. The district has 268 inhabitated villages.

The district Gross District Domestic Product (GDDP) and per capita income during 2015-16, at current prices, was much below than the state average.

4.20.2. Demographic profile

According to the 2011 census, Bathinda district has a population of 13,88,525 of which male and female population were 53.52% and 46.48% respectively. Out of the total population of the district, 64% residing in rural and 36 % is urban. The district has recorded a decadal growth rate of 17.3%. The district has density of 414 persons per sq. km. The district has a sex ratio of 868 females per 1000 males. The literacy rate of the district was 68.3%.



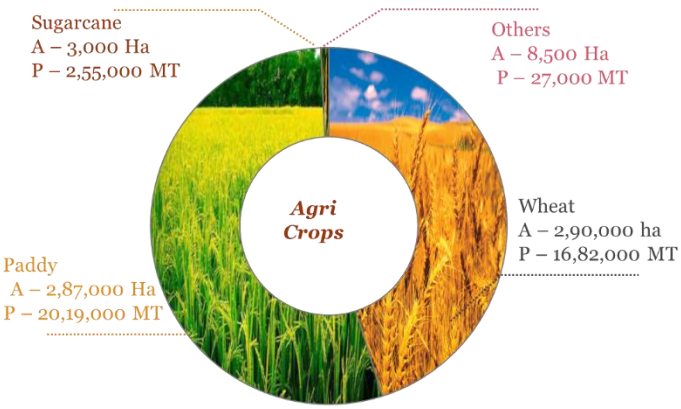
4.20.3. Climate and Rainfall

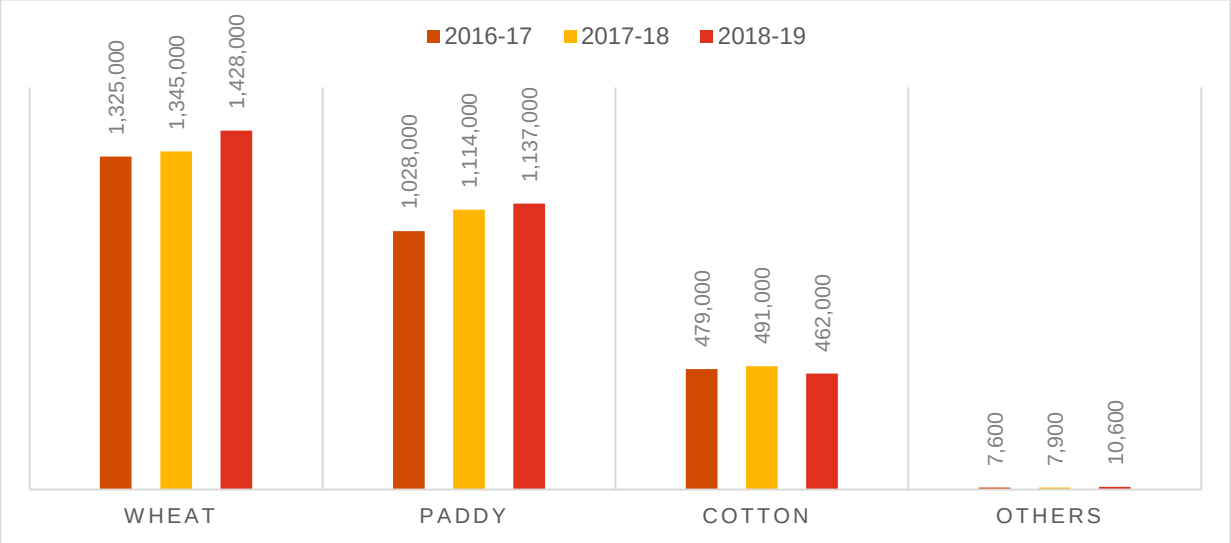
Geographically Bathinda district falls in the Central-Southern part of Punjab. The district has a very hot summer, mild rainy season and dry but embracing winter. The climate, on the whole, is dry in the district. May - June are the hottest months of the season. The temperature occasionally touches 47^{0}C and scorching dust-laden winds blow during the hot season. January is the coldest.

4.20.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is 87%. The district has the cropping intensity of 189%. The whole of the district is a low-lying flat area.

The district Bathinda is the second highest producer of wheat after district Sangrur. Wheat and paddy are the main Rabi and kharif crops of the district. The other crops of the district are barley, mustard, gram etc.





Graph 154: Production trends of field crops in Bhatinda district

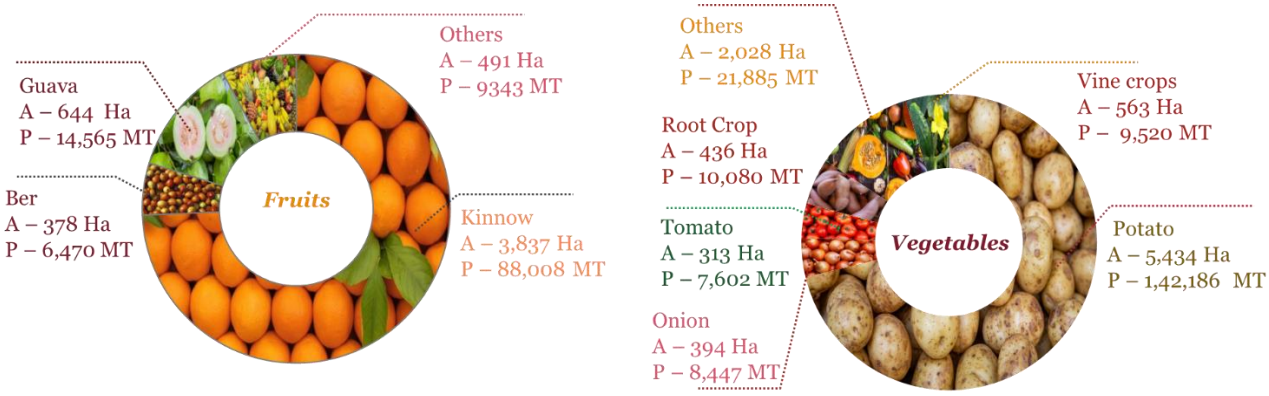
Source: Department of Agriculture, Govt. of Punjab

4.20.5. Horticulture profile

The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc. Overall there is cumulative growth of over 14% in the area under vegetables in last four years (from 2016-17 to 2019-20). Out of all vegetables in the district, maximum area is under Potato.

Graph 155: : Major Field crops grown in district Bathinda (2018-19)

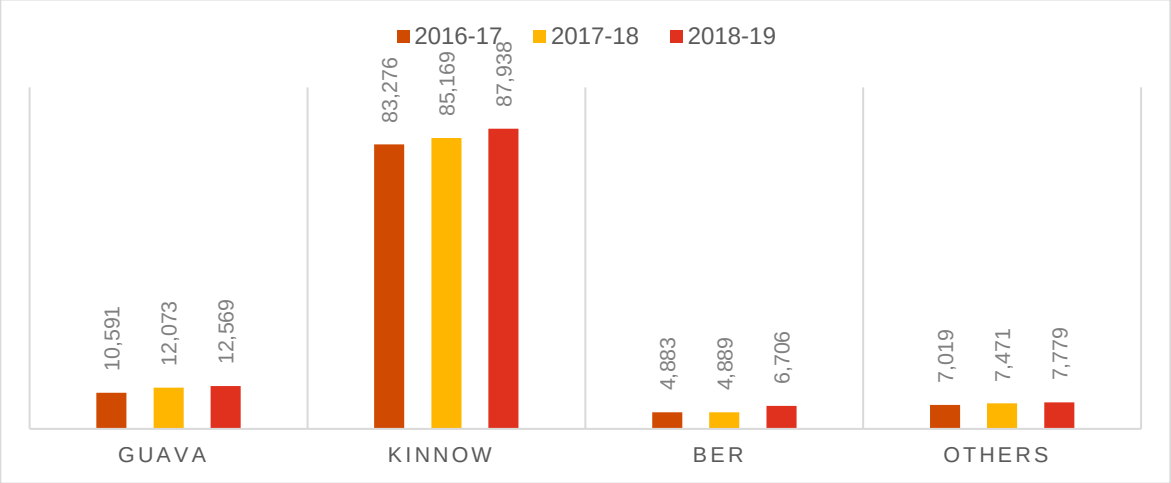
The district produces a wide variety of fruits like guava, kinnow, peach, ber etc. During the period from 2016-17 to 2019-20, the area under fruit crops is reported a cumulative growth of 3%



Graph 156: Major fruits and vegetables grown in district Bathinda (2019-20)

Production trend-Fruits

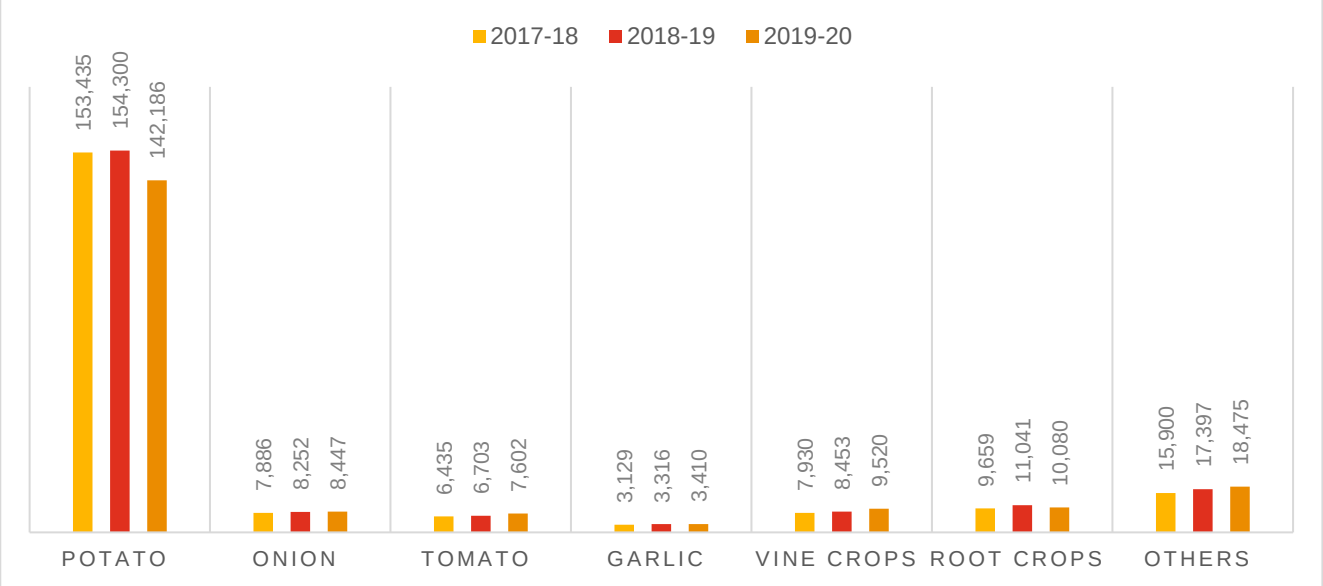
All fruit crop has shown increasing trend of production in the district.



Graph 157: Production trend of fruits in Bhatinda district (MT)

Production trends- Vegetables

Production of all vegetables except Potato has shown increasing trend in last three years.

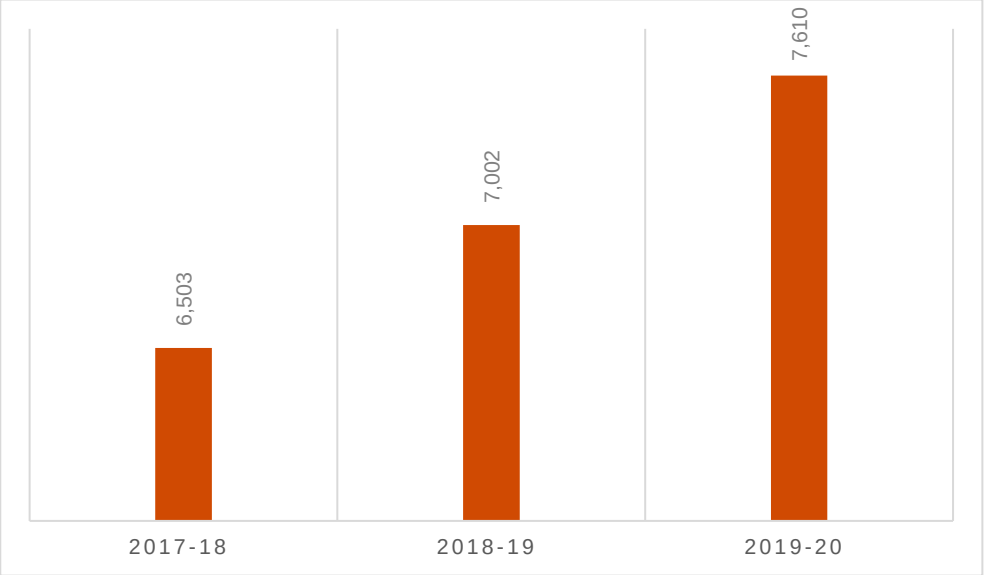


Graph 158: Production trend of vegetable crops in Bhatinda district

4.20.6. Allied activities

Production trend-Fish

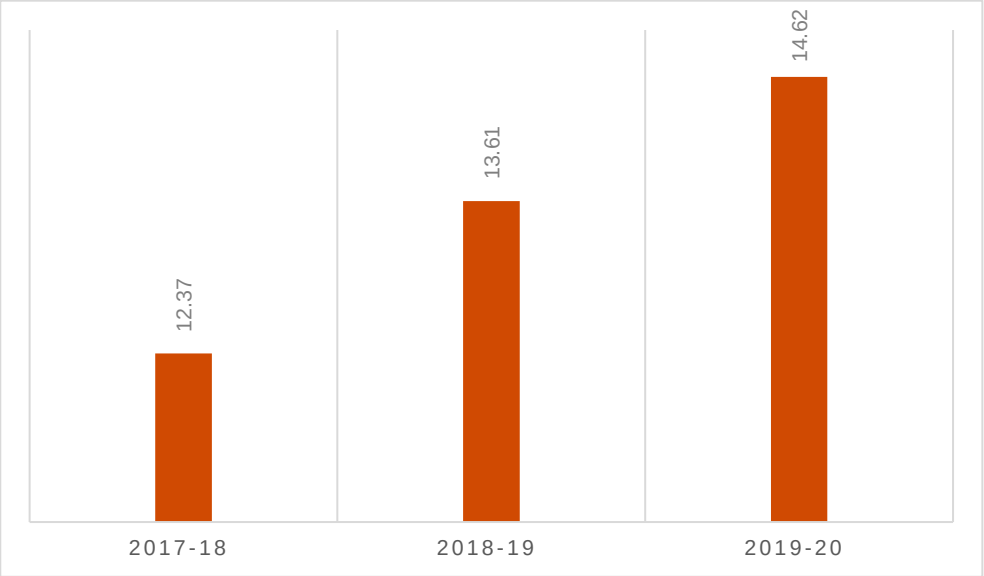
The area and production of fish is consistently increasing in the district for the past three years. The district produces both IMC varieties of fish and Shrimp. However, shrimp is in small quantities. Special efforts are being made to bring saline affected waterlogged areas of Bathinda under shrimp culture as shrimp is comparatively tolerant to salinity and can adopt to the salinity levels of 5-10 ppt (parts per thousand).



Graph 159: Production trend of fish in Bhatinda district (MT)

Production trend-Milk

The production of milk in the district is increasing year after year with 10.98 lakh liter/day during 2019-20.



Graph 160: Production trend of milk in Bhatinda district (LLPD)

4.20.7. Industrial profile

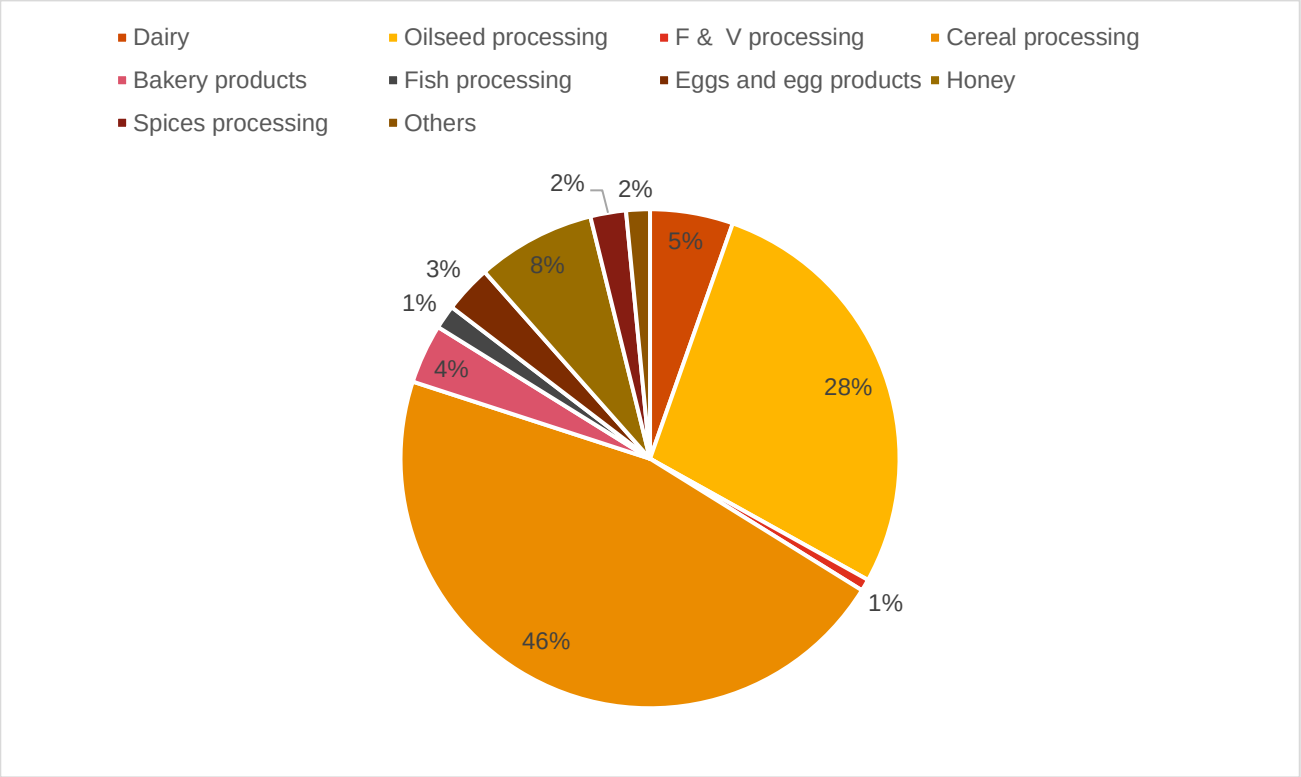
There were 4462 registered Micro Small enterprises in the district and 17 registered medium and large enterprises providing employment to 23998 and 6759 persons respectively, as per FY 2014-15.

Table 24 Industry in Bathinda

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	4462
2	Registered Medium & Large Units	No.	17
3	Employment in MSE Sector	No.	23998
4	Employment in Large and Medium Industries	No.	6759
5	No. of Industrial Areas	No.	4

6	Turnover of MSE Sector	Rs. Lakh	148175
7	Turnover of Large & Medium Sector	Rs. Lakh	268047

Source: District Industries Centre, Bhatinda



Graph 161: Spread of different micro food enterprises in Bhatinda

About 46% of the micro food enterprises are into cereal processing, 28% into oilseeds processing, 8% into honey processing, 5% into dairy processing, 4% into bakery.

The district has about 195 small sized rice mill, two medium sized basmati paddy milling units engaged in domestic sale as well as export of rice, five medium sized solvent extraction units. There are over 50 cattle feed units processing locally available de-oiled cake (cotton seed). Cargill India has a cattle feed unit in the district with a production capacity of 10,000 MT per month. The majorly micro enterprises are mainly into manufacture of cattle feed and expelling of oil from cotton seed and Mustard.

There is no unit of processing fruits and vegetables in the organized sector. However, there are number of individuals/ SHGs/FPOs etc. engaged in manufacture of pickles, murraba, haldi, squash, spices, etc. There exist a beekeeper association which has 350 members in it. The beekeepers from the district have organized themselves in a FPO and are involved in honey processing. There are about 30 honey processors in district Bathinda.

The state co-operative Milkfed has milk processing plant in the district which handles 1 LLPD. Besides, there are over 500 dairies run by individuals and micro enterprises that process milk to manufacture paneer, curd, lassi, kulfi, etc. for local consumption. There are about 400+ bakery units present in the district.

4.20.8. ODOP

Honey has been selected as ODOP of the district.

Beekeeping or Apiculture is an age-old practice in India and is an integral component of agriculture, rural development, and national economic development. It plays a critical role in conservation of ecosystems over the world. Beekeeping is an important allied activity that supports livelihood of rural households especially in tribal and hilly areas at large scale. Apiculture is prevalent in areas with rich flora. In addition to the revenue obtained from honey and other bee products, pollination activities of honeybees are important which contribute to the increased crop yield to an extent of 20-80 per cent in most of the cultivated crops through cross pollination.

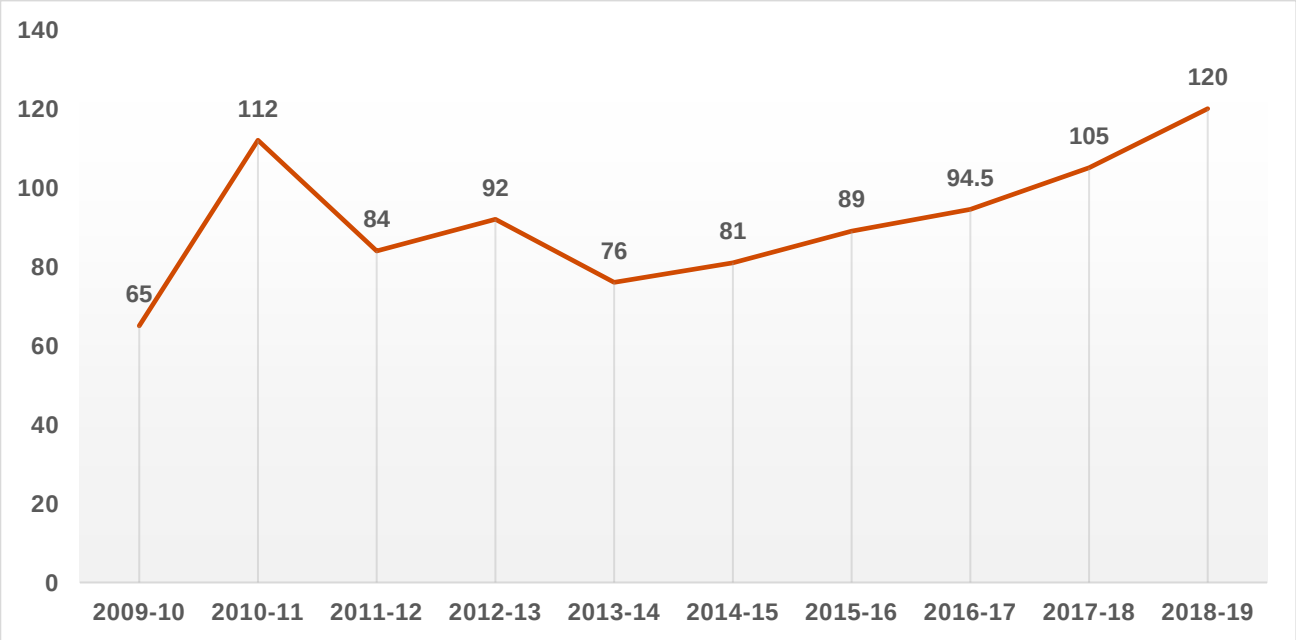
India is home to wide range bee species, in Northern, Eastern and Western states of India *Apis mallifera and Apis Ceranaindica* are predominantly found whereas in southern states *Apis ceranaindica* are found. Major sources of honey production are Rapeseed / Mustard, Eucalyptus, Litchi, Sunflower, Barseem, Forest flowers, citrus, coffee, tamarind etc.

Products and byproducts of beekeeping are honey and wax, pollen, propolis, royal jelly and bee venom.

4.20.8.1. Cluster of Honey

National level

India is one of the leading honeys' producing countries in the world, recording a production of about 120 thousand MT in the year 2018-19[70].The production of honey has increased over the previous years by 27.10 per cent from 2016-17 and by 15.46 per cent from 2017-18.

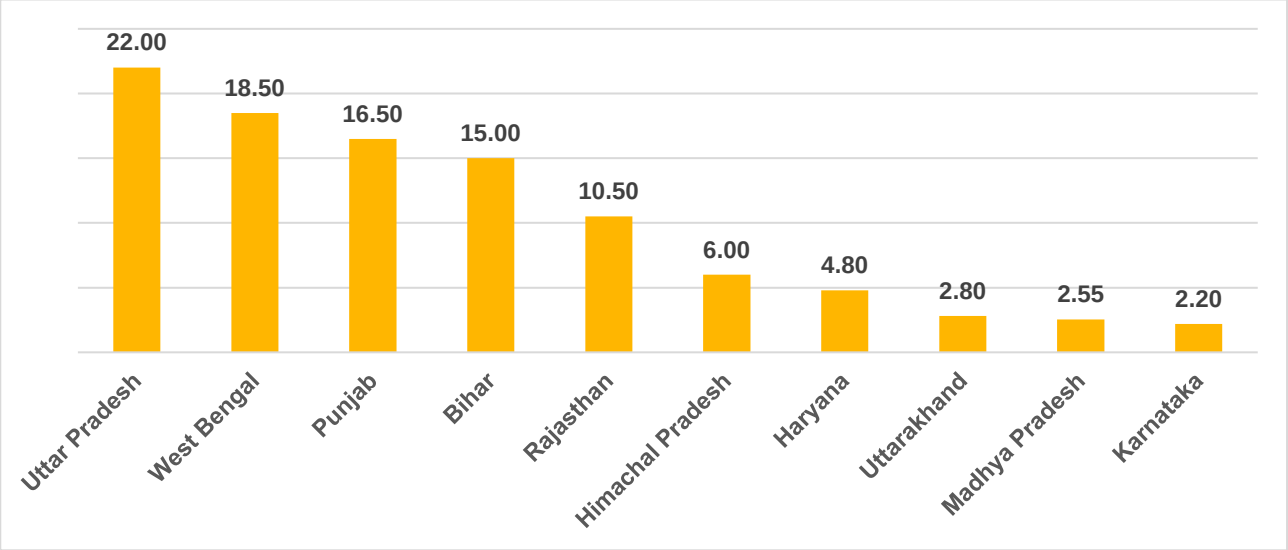


Graph 162: Year wise data of Honey production in India ('000 MT)

Source: National Horticulture Board

Among different Honey production states Uttar Pradesh ranks first in production, followed by West Bengal and Punjab (as per data of year 2018-19).

[70] National Horticulture Board



Graph 163: Honey production in top states of India in FY 18-19 ('000 MT)

Source: National Horticulture Board

Government is giving impetus to beekeeping in India, INR 500 crore has been allocated under Atmanirbhar Bharat scheme for National Beekeeping and Honey Mission for FY 21 to FY 23. Mission encompasses holistic development including beekeeping, beehive products, including collection, processing, storage, marketing, value addition, R&D etc.

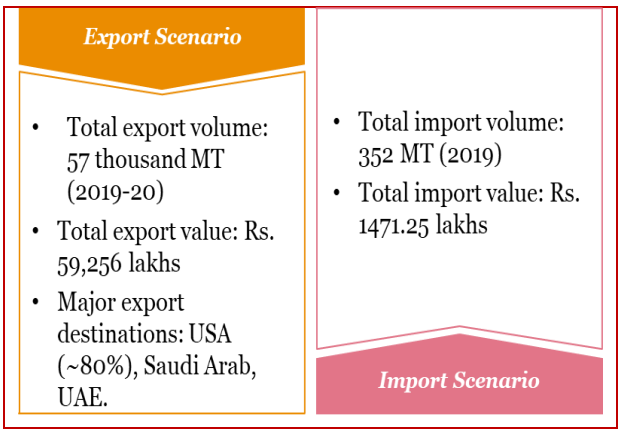
Share of India's contribution in global trade has increased substantially from 3.6% in FY16 to 5.32% in FY 19. The country has shown a positive trend on the same aspect, as compared to previous years.

Table 25: India's export position in honey trade

Year	% contribution in global trade	Rank
2019	5.32	6th
2018	4.50	8th
2017	4.70	7th
2016	3.69	10th

Indian honey is majorly exported to US (~80 per cent). India's position in the world trade in terms of imports is very minuscule percentage – 0.10 per cent out of total import volume on the global map.

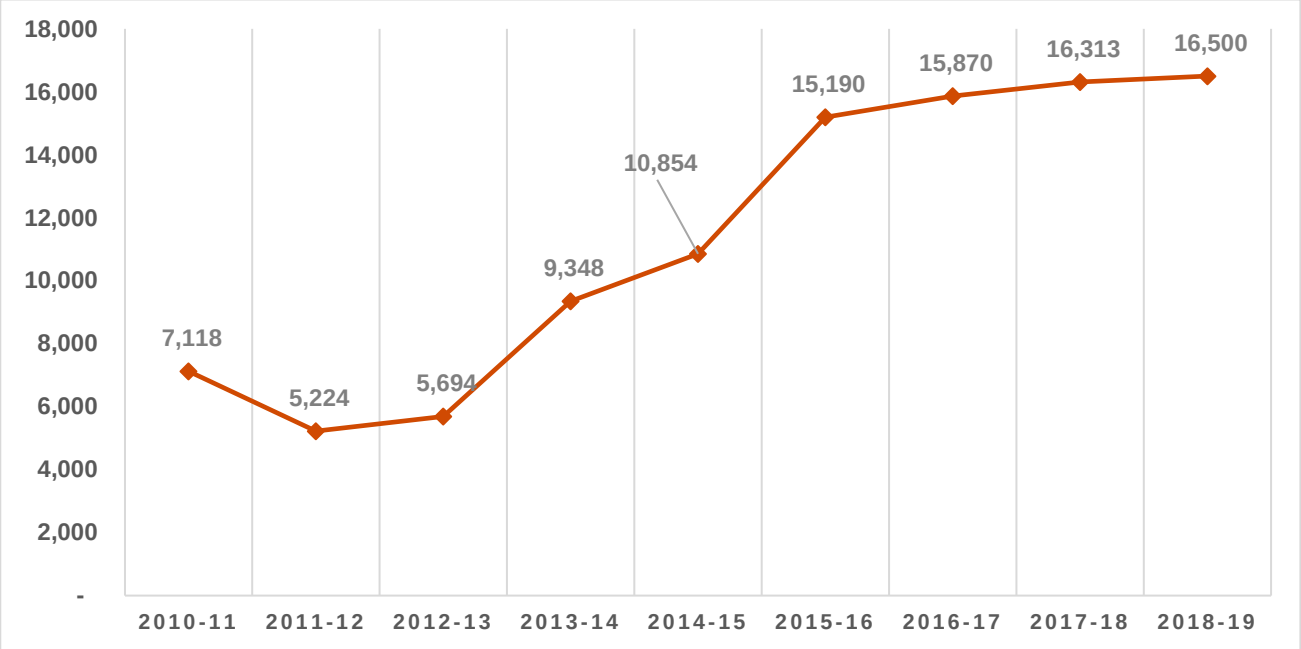
A brief snippet of exports and imports from and to India is depicted in the infographic herein.



The aforementioned export figures of the country depict a huge untapped potential for the sector.

Clusters within the state: Bathinda

Punjab ranks 3rd in India in the production of natural honey after the states of Uttar Pradesh and West Bengal. As per the data 2018-19, Punjab produced 16.50 thousand tons of honey and contributed to 13.75 per cent of the total production of honey (120,000 MT) in the country. The climatic conditions and flora in Punjab are quite suitable for commercial beekeeping. Honey bee colonies have propagated in areas with Mustard, Sunflower, Cotton fields and eucalyptus plantation or forest cover. Litchi based honey production has been taken up by Pathankot beekeepers. Based on season, beekeepers migrate their colonies to districts like Ludhiana, Jalandhar and Hoshiarpur and Rajasthan by July-end.



Graph 164: Honey Production in Punjab (MT)

Source: National Horticulture Board

Bhatinda district is one of the major contributors in Honey production in Punjab. Honey processing cluster is setting up in the district. The honey processing cluster has been setup in Tungwali village, which is 20 Km away from Bhatinda district head quarter.

The Tungwali Honey Processing Cluster is the first cluster of the Punjab which is implemented under the scheme named SFURTI, Ministry of MSME, Govt of India with the support of grant of rupees 249 lakh and 68 lakh contribution of society. The nodal agency for the project is National Institute of Micro, Small and Medium Enterprises (NIMSME), Hyderabad. The project implemented under the supervision of District Industries Centre, Bathinda. The project will enhance the livelihood of Beekeepers and other people who associated with beekeeping and honey related businesses[71].

[71] https://tungwalihoney.com/

The Tungawali Cooperative Society

The Tungawali Cooperative Society was incorporated on 03-03-2003 and total 25 members are associated with the society. The society is engaged in the processing, packaging and marketing of honey. These 25 members are engaged in the honey production. The society has taken the benefits under SFRUTI scheme for setting up of honey processing, manufacturing, and packaging. The total grant availed under the SFRUTI scheme by the society was Rs 3.35Cr. The society established the plant with a capacity of 5MT/day with this grant support.

Major source of revenue for the society is sales and marketing of the honey produced by the members. The society is playing an important role in ensuring the better price realization for the honey produced by members. The society procures the raw honey produced by members for processing in its own facility.

The members were involved in the honey production before the formation of society in Year 2003. The society was engaged in the honey production and marketing activities since then, but it was happening on a limited scale. The real push came during 2017, when the society received the grant of Rs 2.04 Cr. under SFRUTI scheme for the establishment of honey cluster. The scale of the business got huge push as society was able to develop required infrastructure with the grant received under the scheme. Approximately 100 MT of honey was sold during FY 2018-19. The sales volume reduced significantly during FY 2019-20 due to pandemic related disruption. Total 80 MT of honey was sold during FY 2019-20. Business started to pick again during FY 20-21 and total 90MT of honey was sold worth Rs 1.08Cr.

The processing facility of the society is available to external honey producers, where they can come and get their honey processed by paying service charge. Around 90 external producers are making the use of processing facility on regular basis. The availability of processing facility has proved to be a big boon for the external producer's as they are able to fetch better price for the processed honey.

Along with the honey, the society also provide services for packaging of the processed honey. It manufactures bottles and jars which can be purchased by the user for packaging of the processed honey. The society has the equipment required for manufacturing bottles, buckets and jars. The society charge Rs 5/kg for processing and Rs 1/kg for packaging.

The society provides training and capacity building support to honey producers and is also authorized to provide certification. The society is an approved training partner for Khadi village board. Any willing producer can approach the society for training and training sessions are conducted on the basis of batch availability. The training is provided in collaboration with khadi and village gram board.

4.20.8.2. Quality parameters

Quality control and standardization of honey are pertinent for enhancing sales in domestic markets. There are certain quality specifications as per which exports in the international market take place. Especially, in terms of level of pesticides and insecticidal residue in the finished product.

Quality specifications set by Food Safety and Standard Authority of India (FSSAI)[72]- which is an autonomous body under Ministry of Health and Family Welfare under Government of India- is listed in the table below:

[72] Circular dated 01.07.2020 - FSSAI

Table 26: Quality standards by FSSAI

Sl.	Parameters[73]	Limits
1.	Specific gravity at 27 degrees (C)	>= 1.35
2.	Moisture	<= 20
3.	Total reducing sugars	
	Carviacalossa and honeydew honey	>= 60
	Blends of honeydew honey with blossom honey	>= 45
	Others	>= 65
4.	Sucrose	
	Carviacalossa and honeydew honey, max	<= 10
	Others	<= 5.0
5.	Fructose to glucose ratio	0.95-1.50
6.	Total ash	<= 0.50
7.	Pollen count and plant element/g	>= 5000

Apart from the ones listed above, there are certain other parameters detailed out by FSSAI that are to be adhered to for selling and exporting honey. These prescribed specifications undertake a pivotal role in product labelling.

4.20.8.3. Turnover & employment of the Beekeepers

Production

Beekeepers get income from sale of honey, wax, and pollen. Major expenditure is initial cost on the purchase of bee boxes, colonies, honey extracting machine, gloves, veil, and other tools.

Revenue from 50 colonies of Honeybee is shown in the table below: -

#	Particulars	Price	Income
1	Honey production @25 kg per colony, total production (25*50=1250) kg	200/- per kg	250,000
2	Cost/ sale price of bee colonies of 8 frame each multiplied during the year i.e., at least 50 colonies (50x300x8) = (15000x8)	2400/- per colony	120,000
3	Production of bee pollen (250 kg) @ 5 kg/ colony	360/- per kg	90000
	Sub Total		**460,000**

Table: - Revenue analysis of Honey production from 50 colonies.

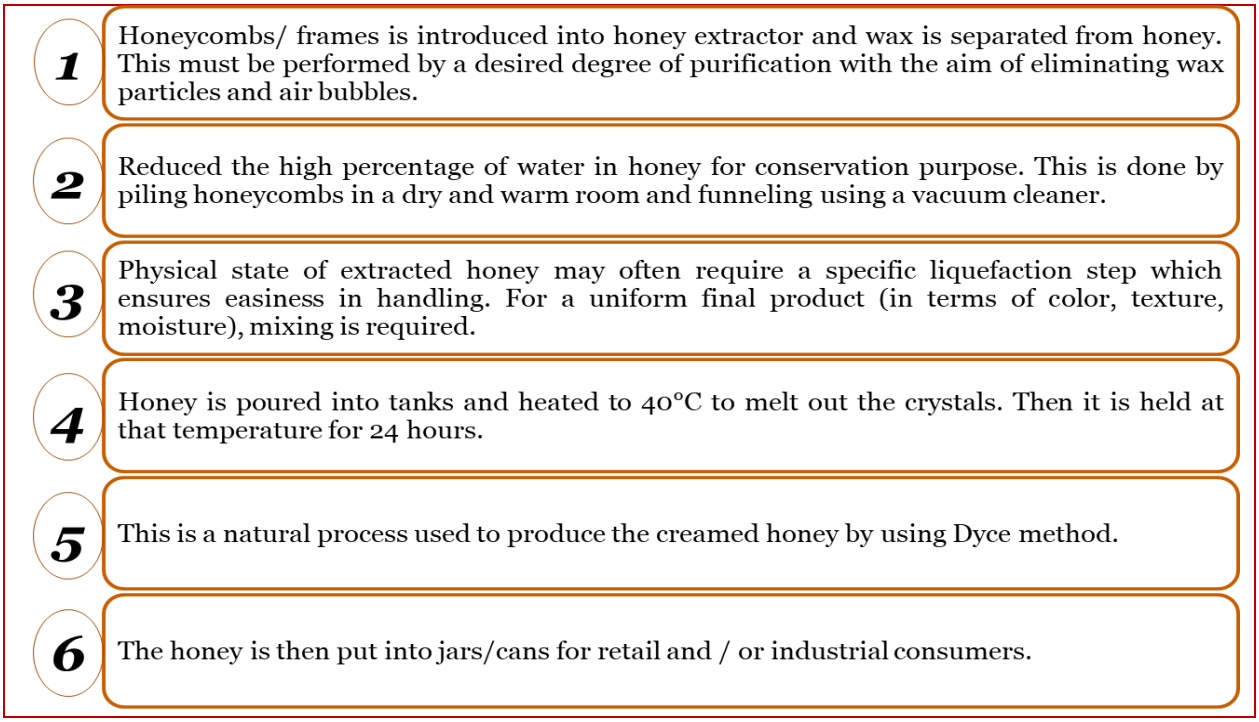
A production system of 50 colonies can provide employment to 2-3 people.

Processing

The industry of honey is a complex sequential chain of processing operations. It involves many steps in processing from the initial extraction to the packaging of the final food product. In general, the processing involves steps Initial extraction, Dehumidification, Liquefaction and mixture, Heating, Pasteurization, Crystallization and Final packaging.

An indicative procedure is depicted in the below infographic:

[73] Unit = percent by mass (for 1 to 6)



After the initial harvest, the material (e.g., honeycombs, frames) is introduced into the so-called honey extractor: a container able to remove honey by means of the centrifugal force. The operation is carried out into special rooms, with possibility of heating. At the exit from the extractor, the honey is (a) collected by gravity in tanks placed often on the floor (wax is separated from honey) and (b) sent to the decanters with the aid of pumps from the same floor. The extraction is performed by a desired degree of purification with the aim of eliminating wax particles and air bubbles, which are possibly mixed with honey during extraction.

The purification is carried out with two different techniques: decanting and filtration. The processed honey is immediately bottled in clean wide mouthed bottles. It is then sealed by PP Caps. Bottles are wiped dry and labelled. Filled, sealed & labeled bottles are then packed in labeled cardboard boxes

18 Manpower can be employed for the Honey Processing Unit. Which includes 1 Plant Operator, 4 Skilled Labor, 8 Unskilled Labor, 4 Administrative Staffs and 1 Accountant.

4.20.8.4. Socio economic profile of the Beekeepers

It was found that majority of the beekeepers are in young age group (67.8%) and remaining (32.2%) are in the middle age group. More than two third (68%) of the beekeepers are having education up to metric level, whereas 28.6 per cent of respondents are having education up to higher secondary. Only 3.6 per cent of the respondents were having education up to graduation level.

Great majority of the respondents (82.1%) are from general category background while small proportion (10.7%) from backward category. The number of beekeepers from schedule caste category are only 7.2 per cent.

More than one third (35.7%) of beekeepers are small category farmers having land holding less than 2 ha., while 32.1 per cent are medium category farmers. The beekeepers are also from marginal category (17.9%) and 14.3 per cent were landless. This indicates that the economic status of the landless, marginal, and small farmers can be improved by motivating them to adopt bee-keeping enterprise as main profession or as subsidiary occupation with the agriculture.

About 75 per cent of the beekeepers are having farming as major occupation along with bee keeping, about 18 per cent have adopted bee keeping as main occupation. About 7.0 per cent of the beekeepers are from the service cadre.

4.20.8.5. Infrastructure available in the district

Honey processing cluster is developed in the Tungwali village of Bhatinda district which is 20 Km away from district headquarter. The Tungwali Honey Processing Cluster is the first processing cluster of the Punjab which is implemented under the scheme named SFURTI, Ministry of MSME, Govt of India with the support of grant of rupees 249 lakh and 68 lakh contribution of society. The nodal agency for the project is National Institute of Micro, Small and Medium Enterprises (NIMSME), Hyderabad. The project implemented under the supervision of District Industries Centre, Bathinda. The project will enhance the livelihood of Beekeepers and other people who associated with beekeeping and honey related businesses[74].

4.20.8.6. Technologies available for processing in the district

The processing cluster is equipped with modern technology-based honey processing machine. The unit is managed by Tungwali Honeybee Producer Co-operative Industrial Society situated at village Tungwali, Bathinda, Punjab. It spreads in Land Area of 8 kanals which has been taken on lease. It contains designed Warehouse for storage, machineries which include extraction to packing machines.

4.20.8.7. Human resource scenario

Bee keeping and Honey processing require skilled labors which are scantily available. The scarcity is felt severely for skilled human resource in the district. The labors are available from local as well outside states like UP and Bihar.

4.20.8.8. Skill set of manpower

Skilled human resource is lacking in the district. Basic skills required for beekeeping like removing honey crop from hive, manipulating honeybee brood, preparing, and using bee smoker, opening and reassemble a beehive, managing pests and disease within a honeybee colony and assembling and maintaining beekeeping components etc are lacking there in the local human resources available in the district.

It is observed that there is a need of appropriate skill development and training to be done for workers employed in processing units. Focus is to be provided for capacity building activities of these workers. Trainings related to technological upgradation is required. Also, the need of practical hands-on is essential. Training should focus on multi-faceted areas of apiculture like marketing, product knowledge, technology, etc. apart from basic knowledge of operations of beekeeping.

4.20.8.9. Testing facilities available in the district

Little presence of testing facilities in the districts is another area of concern. An alternative could be mobile testing vehicles which could collect sample from each area of all districts where beekeeping is being done. Focus should also be given to the small sized units, as there is a lot of adulteration involved in honey as a product which makes it difficult for a brand to impart trust on the consumers

Honey testing facility is developed at the Tungwali processing cluster. Testing facilities are also there at FSSAI labs.

[74] https://tungwalihoney.com/

4.20.8.10. Institutional support available for the Honey

"Sweet Revolution" is helping in the holistic development of beekeeper in the state. Central Sector Scheme "National Beekeeping and Honey Mission (NBHM)" for overall promotion & development of scientific beekeeping and production of quality honey & other beehive products is also helping in expansion of honey processing in the district. Local cooperative societies like Tungwali Honeybee Producer Co-operative Industrial Society are involved in Honey processing. Such societies will help in active participation of local community in the honey processing activity.

KVK, Bhatinda conducts capacity building programme for honey production and processing. Department of Entomology, PAU conducts qualitative and quantitative research on beekeeping.

4.20.8.11. Support infrastructure available for the Honey production / processing

There are about 30 honey processors in district Bathinda. Progressive Beekeepers Association has 350 members engaged in collection and extraction of mustard honey. In 2018-19, the honey production in the district was 825 MT. Tungawali village is developing as a Honey processing cluster in the district. All the beekeepers have required instruments for bee keeping.

Point of concern especially of small sized beekeeping units, is the issues of theft. Insurance protection for the product could be introduced to protect these small sized entrepreneurs involved in the apiculture business to provide some amount of relief to them during these circumstances. Incentives could be introduced for security equipment like CCTV cameras, etc. for the units.

4.20.8.12. Financial linkages available for Honey processing in the district

There are different schemes which are helping in promotion of beekeeping ad processing. The government has formed several boards for providing help and guidance to the Bee farmers but among all of the National Bee Board (NBB) and Khadi and Village Industries Commission (KVIC) are the prominent. Punjab state co-operative agricultural developing bank also offers loans for beekeeping or apiculture.

But still many banks are patchy in providing credit facilities to the farmers. Farmers need to pay high transaction cost. Lack of information on credit product and small scale of operation found to be major limiting factor in accessing the credit. Many farmers not able to get credit facility to establish processing unit because of non-availability of asset for mortgage.

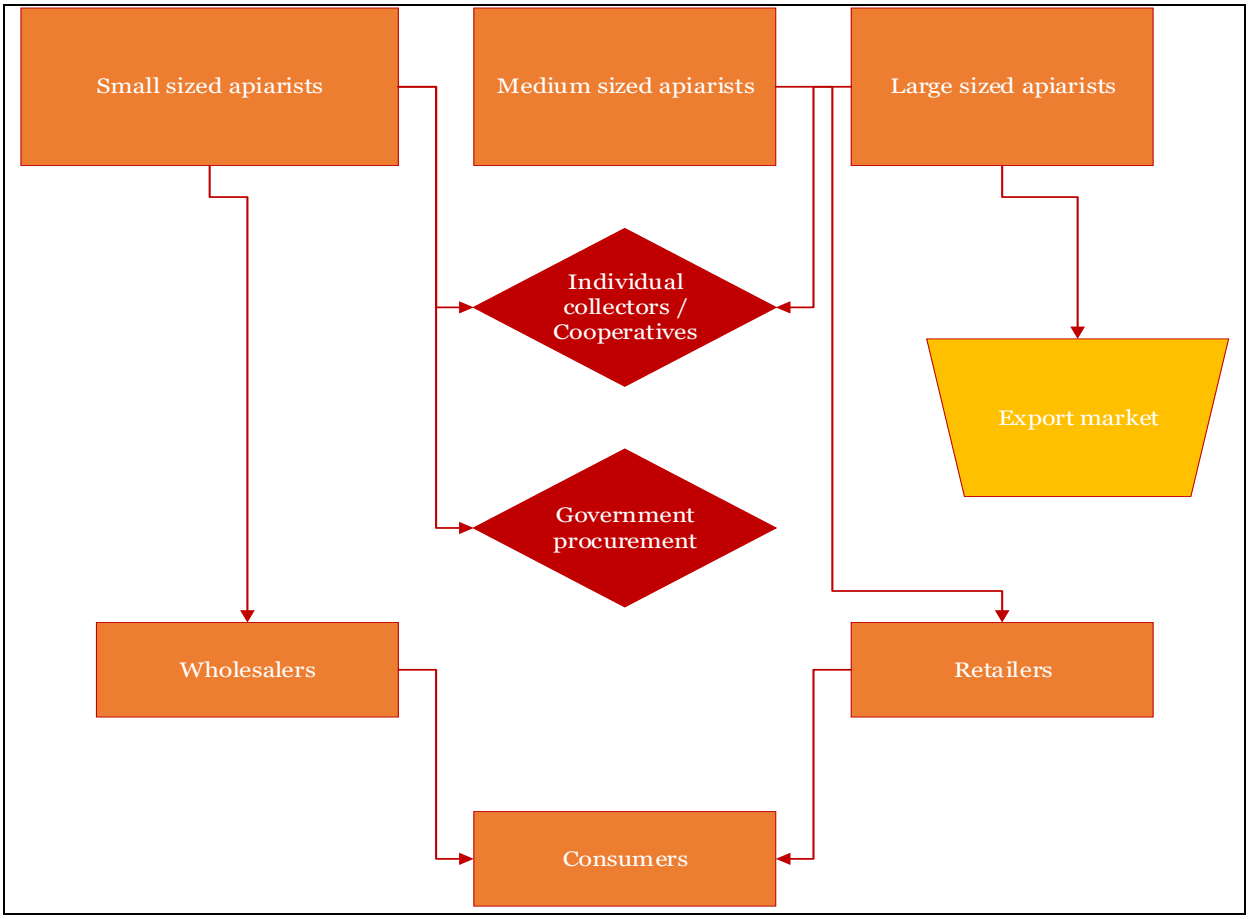
4.20.8.13. Environmental impact due to Honey processing

Beekeeping and honey processing is one of the socio-economic activities, which are friendly to forests and the environment in general. In many ecosystems, bees are important pollinators ensuring the maintenance of those ecosystems. For a long time, agriculture has recognized the value of pollination by bees. Even backyard beekeepers witness dramatic improvements in their gardens yield: more and larger fruits, flowers, and vegetables. Pollination service to the plants and help in getting increased fruit setting and yield. The farmers said that in several crops, particularly mustard, they felt that the productivity had increased slightly. Farmers attributed this to improved pollination due to beekeeping[75].

4.20.8.14. Value chain mapping

Value chain of the honey in the district can be divided based on size of apiarist. Small sized apiarists sell the produce to wholesalers and then wholesalers sell it to consumers. Medium sized apiarists sell to aggregators/cooperatives and government procurement. Some of the large sized apiarists sell to export market.

[75] https://birdlucknow.nabard.org/wp-content/uploads/2020/03/11-Promoting-Bee-Keeping-DNPPCL.pdf



The list of stakeholders consulted for honey have been annexed along with this SLUP report.

4.20.8.15. Identified need gaps

- During our secondary and primary research and discussion with stakeholders of beekeeping in Punjab, it was observed that there is a need of appropriate skill development and training to be done for workers employed in processing units. Focus is to be provided for capacity building activities of these workers. Trainings related to technological upgradation is required. Also, the need of practical hands-on is essential. Training should focus on multi-faceted areas of apiculture like marketing, product knowledge, technology, etc. apart from basic knowledge of operations of beekeeping.
- Presence of testing facilities in the districts is another area of concern. An alternative could be mobile testing vehicles which could collect sample from each and every area of all districts where beekeeping is being done. Focus should also be given to the small sized units, as there is a lot of adulteration involved in honey as a product which makes it difficult for a brand to impart trust on the consumers.
- Another point of concern discussed, especially of small sized beekeeping units, was the issues of theft. Insurance protection for the product could be introduced in order to protect these small sized entrepreneurs involved in the apiculture business to provide some amount of relief to them during these circumstances. Incentives could be introduced for security equipment like CCTV cameras, etc. for the units.
- Transportation and logistics are also one of the challenges faced by the small-sized units.

4.20.8.16. Firm level gaps

Based on stakeholder interaction in the district we have summarized gaps and recommendations for the holistic development of the honey processing in the district.

	Sectors	Gaps	Recommendations
1	Skill training needs	Lack of skilled manpower and knowledge related to Bee keeping and Honey processing aspects.	It is observed that there is a need of appropriate skill development and training to be done for workers employed in processing and production units. Focus is to be provided for capacity building activities of these workers. Trainings related to technological upgradation is required. Also, the need of practical hands-on is essential. Training should focus on multi-faceted areas of apiculture like marketing, product knowledge, technology, etc. apart from basic knowledge of operations of beekeeping. Organizing exposure-cum-learning visits for individual beekeepers, beekeepers' organizations and supporting institutions to successful enterprises in different areas/countries to facilitate knowledge sharing and learning.
2	Manufacturing practices	Processing cluster is established in Tungwali village of district.	Small scale processing unit and mobile testing facilities should be developed in different villages. Supply chain infrastructure should be developed so that honey producers can get service from processing cluster in the Tungwali.
3	Technologies	The processing cluster is equipped with modern technology-based honey processing machine. The unit is managed by Tungwali Honeybee Producer Co-operative Industrial Society situated at village Tungwali, Bathinda, Punjab.	Modern technologies at production level need to be accessible for different activities like removing honey crop from hive, manipulating honeybee brood, preparing, and using bee smoker, opening and reassemble a beehive, managing pests and disease within a honeybee colony and assembling and maintaining beekeeping components.
4	Access to finance	Many banks are patchy in providing credit facilities to the farmers. Farmers need to pay high transaction cost. Lack of information on credit product and small scale of operation found to be major limiting factor in accessing the credit. Many farmers not able to get	Considering the importance of Honey production in the cluster, there is a need to provide adequate level of finance and technical support to promote Honey processing chain in the State. Need of enhanced levels of assistance.

	Sectors	Gaps	Recommendations
		credit facility to establish processing unit because of non-availability of asset for mortgage.	
5	Access to mentorship/service	Access to information on the factors affecting the honey value chain (positively or negatively) such as technical aspects, weather, market, quality, price, government schemes, subsidy, etc.	Access to information and mentorship should be facilitated by linking beekeepers to information service providers. Platforms should also be created for organizing multi-stakeholder meetings and workshops to facilitate information sharing among various stakeholders such as government, nongovernment, and private sector organizations

4.20.8.17. SWOT Analysis

As mentioned earlier, honey has been selected as ODOP for the Bathinda district. Following is the SWOT analysis for the bakery product in these districts.

SWOT Analysis	
Strengths: • Production of high-quality produce. • Expertise of people in apiculture. • Suitability of climatic condition for commercial bee keeping.	**Weakness:** • Unorganized nature of production. • Lack of efficient marketing channel for the remunerative marketing of the produce • Small scale of production at individual level.
Opportunities: • Opportunity for common branding and marketing through organizing the small producers • Opportunities for collaboration with organized retail players for the sale of the product.	**Threats:** • Maintaining the quality of the produce due to rising production cost. • Lack of training and capacity building in order to meet the hygiene regulatory requirements

4.20.8.18. Identified gaps and recommendations

Various gaps were identified at the firm and cluster level, where work needs to be done in order to increase the scale of activities for ODOP in cluster districts. Following are the major firm level and district level gaps identified through stakeholder consultations.

Infrastructure	Up-gradation proposals
A) Public Infra	Public infrastructure is available in the district. Development of supply chain facilities and marketing facilities will help in increasing productivity and income of farmers in the district.
B) Common facilities	Common facilities such as honey processing units,

Infrastructure	Up-gradation proposals
	hive distribution centers shall be set up with the support of PM FME scheme. ICAR-KVKs, HPBI,NABARD and KVIC can support in FPO formation. FPOs will collect honey from producers, and this will reduce the role of middlemen and reduce the gap between price at point of collection from beekeeper and market price (which is wide at present).
C) Testing facilities	There should be mobile testing vehicles which could collect sample from each area of all districts where beekeeping is being done. Focus should also be given to the small sized units, as there is a lot of adulteration involved in honey as a product which makes it difficult for a brand to impart trust on the consumers
D) Institutional support	The central govt should support / facilitate for setting up of State Bee Boards/ State Beekeeping and Honey Missions/ other institutional framework which may include cooperative system/ FPCs/ FPOs, etc. for overall promotion and development of scientific beekeeping in the States. The women groups should be empowered in beekeeping and thrust should be given to marginalized farmers. To strengthen beekeepers should be done by developing institutional framework through collective approach viz.; formation of SHGs/ FPOs/ Beekeepers Cooperatives/ Federations, etc Infrastructure for packaging, storages, cold Storage, etc. for honey & other beehive products should be involving FPOs, / Firms/ Societies, etc.
F) Marketing support	Postharvest and marketing infrastructures, including honey processing plants, storages/ cold storages, collection, branding, marketing, etc. should be developed. As adulterated honey available in the market is hampering the price Minimum support price should be announced for honey because farmers of the area witnessed the unfair trade practices which severely affected the entire farming community hence the concerned authorities are advised to extend the online trading platform (e-NAM) to cover the entire Honey production in a phased manner.

4.20.8.19. Suggested interventions

Particulars	Gaps/ Problems	Suggested Interventions	Intervention Agencies	Actions under PMFME
Processing units	• Non availability of processing infrastructure	• Strategic promotional	• Individual entrepreneurs	• Assistance under the

	• Lack of interest in taking up the processing activities • Lack of access to credit for expansion	activities to mobilize local enterprises/farmers for setting up small processing units. • Setting up of Common Incubation Facility	• Farmers • SHGs • Farmer Producer Companies • Existing Processing Units • KVKs • Private Institutions	individual and group component part of the PMFME scheme
Capacity Building	• Low technical know-how on processing process and hygiene • Lack of formal training on processing	• Training and capacity building under PMFME scheme	• State Level Technical Institution, PAU Ludhiana • DRPs	• Mobilization of potential beneficiaries for training
Marketing & Branding	• No concrete knowledge on market enhancement and processes/techniques to follow • No big buyers are present • Low emphasis on packaging	• Development of common brand for selling of produce	• SNA • Farmers/ Investors/ SRLM	• Establishment of common brand under the branding and marketing component of the scheme
Common Incubation Facility	• Lack of quality processing infrastructure	• Creating a common infrastructure for processing of honey and F&V for micro enterprises and individuals	• SLTI • SNA • Private Institutes	• Setting up of common incubation facility at Bathinda

The intervention will help in better price realization to Honey growing farmers. Framers will be motivated and there will be expansion in Honey production area. Honey processing will help in fetching export market and it will help in income inequality among farmers, by increasing income. Increase in production and value addition infrastructure will help in generation of employment opportunity in the region. Strong institution at ground will help in established market and skill, capacity building of farmers.

4.20.9. Non ODOP

Other than honey there is ample opportunity to set up grain based products like bread, biscuits, noodles, baby foods in the district. To boost crop diversification in the district, there is need to encourage fruit based pulp, pickle, puree, chutney, syrup units in the district.

4.21. Tarn Taran

4.21.1. Socio economic profile

Tarn Taran was formed in 2006 as the 19th district of Punjab. Tarn Taran is one of the border districts which is carved out of Amritsar District and lies in the North West frontier of Punjab. The district is bounded by district Amritsar in the North East, district Kapurthala in the East and district Ferozepur in the South. The district shares international boundary with Pakistan. It is bounded by river Beas in the South Eastern side. Harike Wetland, also known as 'Hari-ke-Pattan', is the largest wetland in Asia, falls in the Tarn Taran district.

Tarn Taran is one of the most historical town with history spanning over 400 years. It is an important religious town due to its connectivity with the fifth Sikh Guru Arjun Dev Ji, who founded the town. Guru Sahib created this city for the welfare of people. He was the first to initiate the noble cause of curing the leprosy patients.

Headquarter of the district is in Tarn Taran city. The district is divided into three tehsils namely Tarn Taran , Patti, and Khadur Sahib. The district is divided into 8 development blocks namely Gandiwind, Bhikiwind, Tarn Taran, Khadur Sahib, Naushera Pannuan, Chohla Sahib, Patti. and Valtoha. The district has 478 inhabited villages.

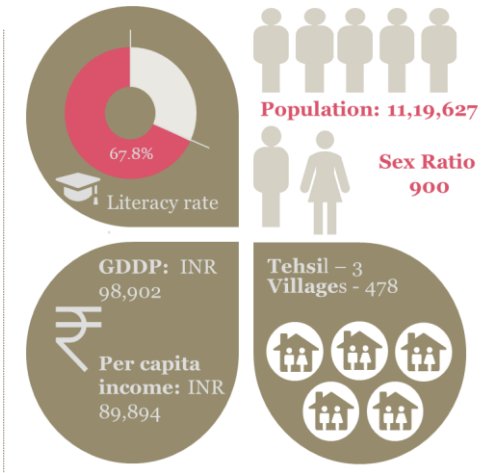
The Gross District Domestic Product (GDDP) and per capita income of the district at current prices is much below than the state average.

4.21.2. Demographic profile

According to the 2011 census, Tarn Taran district has a population of 11,19,627 of which male and female population were 52.64% and 47.36% respectively. Out of the total population of the district, 87.3% residing in rural and 12.7 % in urban. The district has recorded a decadal growth rate of 19.2%. which is significantly higher than other districts. The district has density of 464 persons per sq. km. The district has a sex ratio of 900 females per 1000 males. The literacy rate of the district was 67.8%[76].

4.21.3. Climate and Rainfall

The climate of the district primarily is characterized as general dryness except in monsoon season. A hot summer and a bracing winter. The heat during the summer remains intense and hot laden winds which blow during afternoon adds much to the discomfort. The temperature touch the maximum in May and June. The January becomes the coldest month with a maximum temperature 18.9 degree centigrade and minimum 4.7 degree centigrade.



Graph 165: Socio economic profile of Tarn tartan district

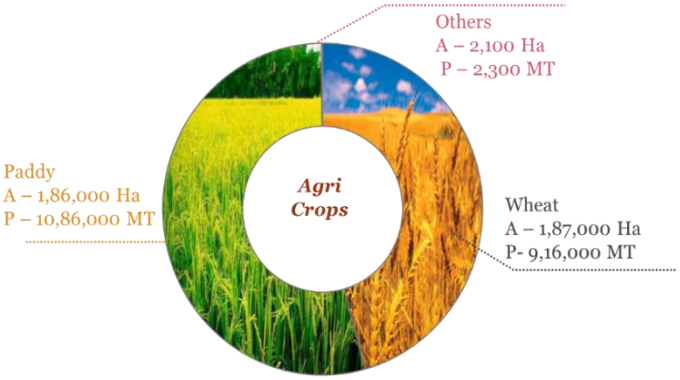
Source: Census 2011

[76] Source: Census 2011

4.21.4. Agriculture profile

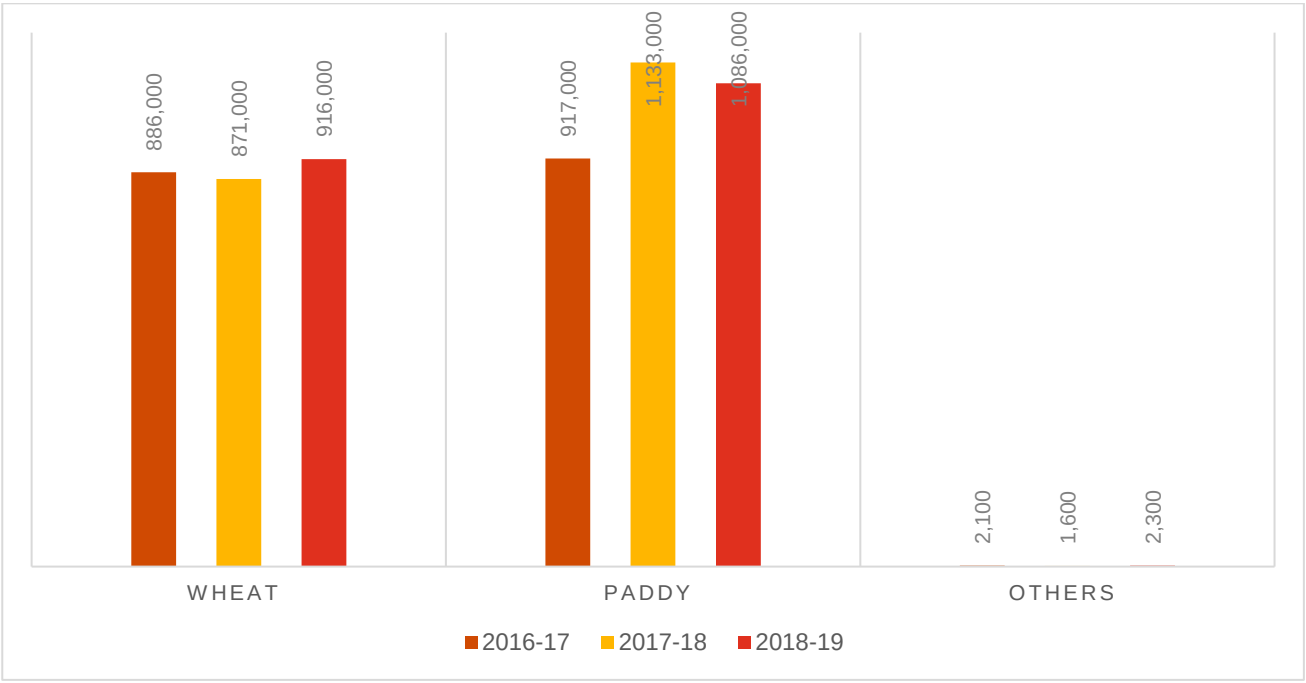
Out of the total geographical area of the district, the net sown area is 90%. The district has the cropping intensity of 182%. The whole of the district is a low-lying flat area. Wheat and paddy are the main Rabi and kharif crops of the district. The other crops grown in the district area Kharif & rabi oilseeds, Kharif Pulses in small quantities.

The graph shows that there has been an increase in production of wheat whereas production of paddy has shown erratic trend.



Graph 166: Major Field crops grown in district Tarn Taran (2018-19)

Source: Department of Agriculture, Govt. of Punjab



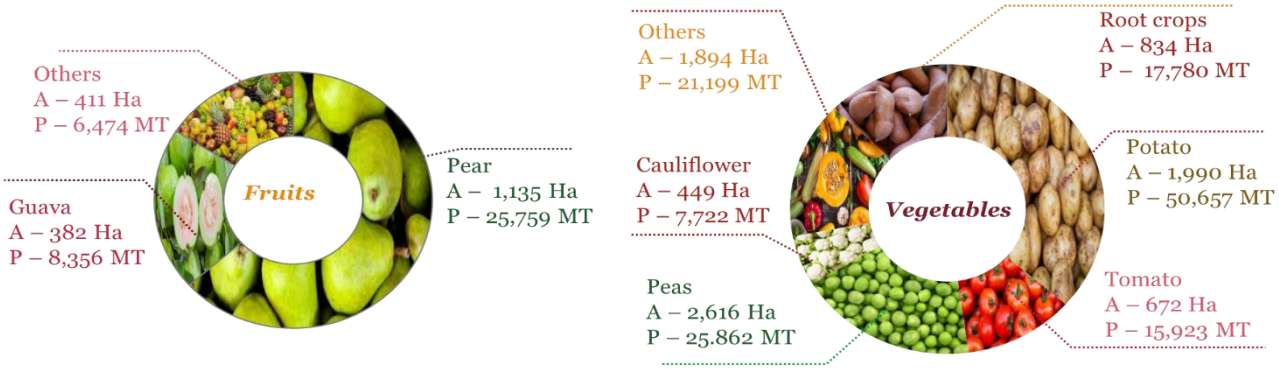
Graph 167: Production trends of field crops in Tarn Taran district

Source: Department of Agriculture, Govt. of Punjab

4.21.1. Horticulture profile

The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc. Overall, there is cumulative growth of 11% in the area under vegetables in last four years (from 2016-17 to 2019-20). Out of all vegetables in the district, maximum area is under Potato and peas.

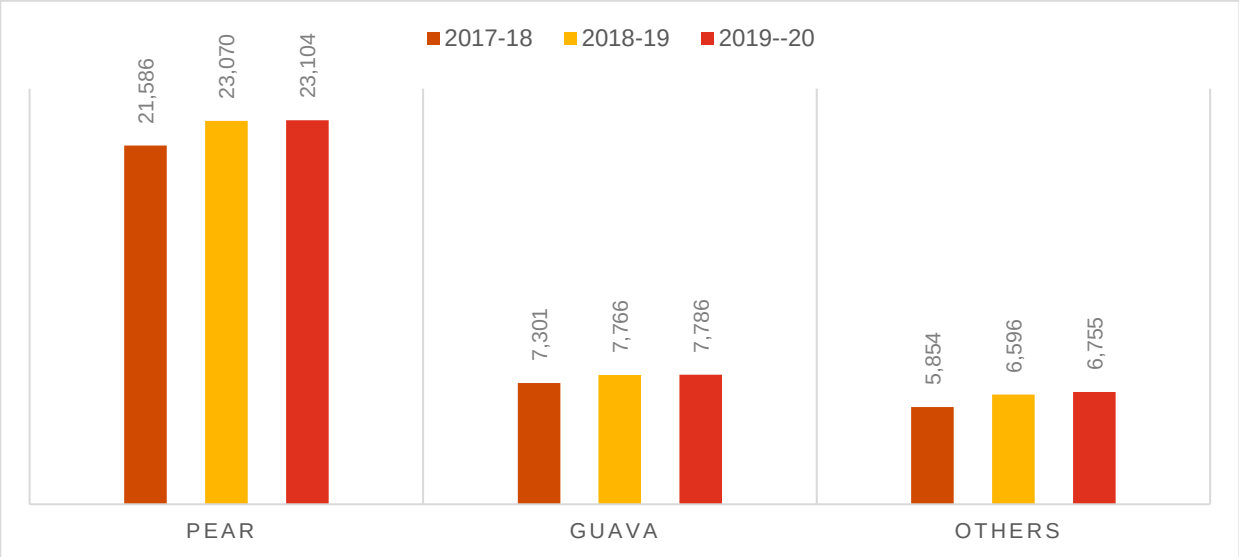
The district produces a wide variety of fruits like guava, kinnow, lime lemon, pear, mango, ber etc. of these **area under pear is maximum** During the period from 2016-17 to 2019-20, the area under fruit crops is reported a cumulative growth of 16%



Graph 168: Major Fruits and vegetables crops grown in district Tarn Taran (2019-20)

Production trend-Fruits

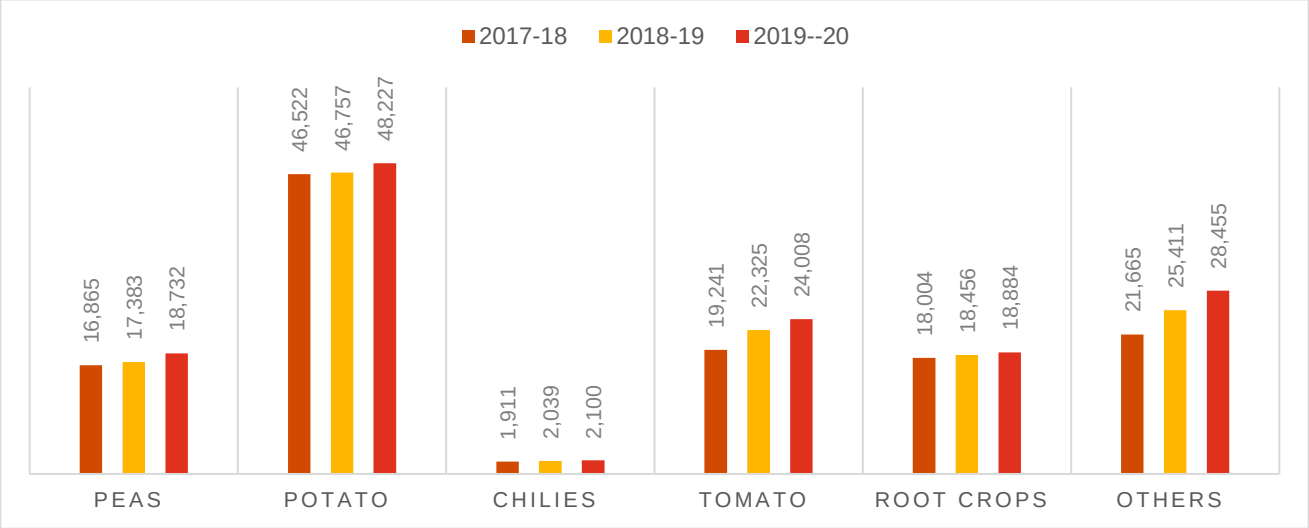
Production of pear, guava and other fruit crops have increased over last three years.



Graph 169: Production trend of fruit crops (MT)

Production trend-Vegetables

Production of all vegetables has increased over last three years. This is the result of initiatives taken by horticulture department.



Graph 170: Production trends of vegetables in Tarntaran district (MT)

4.21.2. Allied activities

Production trend-Fish

The production of fish has decreased from 7,035 MT in 2016-17 to 5,811 MT in 2018-19, a cumulative fall of 17% in three years. The district produces IMC varieties of fish and the surplus production is sold in Jalandhar, Bathinda and Ludhiana markets

Production trend-Milk

The district is one of the largest producers of milk with daily production of over 20.5 lakh litre. There are two small to medium sized milk plants in private sector. But, there are many dairy farmers processing milk to manufacture paneer, curd etc. for local distribution.

4.21.3. Industrial profile

There were 752 registered Micro Small enterprises in the district and 6 registered medium and large enterprises providing employment to 2717 and 609 persons respectively, as per FY 2014-15.

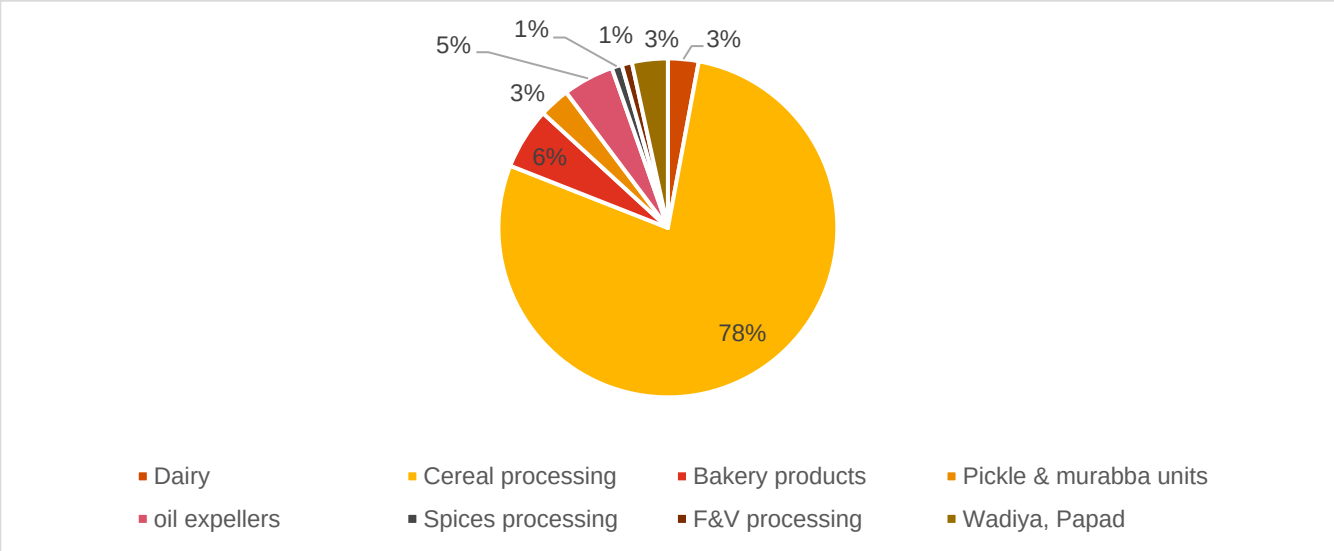
Table 27 Industry in Tarn Taran

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	752
2	Registered Medium & Large Units	No.	6
3	Employment in MSE Sector	No.	2717
4	Employment in Large and Medium Industries	No.	609
5	No. of Industrial Areas	No.	2
6	Turnover of MSE Sector	Rs. Lakh	12004.38
7	Turnover of Large & Medium Sector	Rs. Lakh	38098.67

As the district is one of the lead producers of paddy (mainly basmati). The district is dominated by cereal processing unit. About 78% of the micro food processing units in the state is into cereal processing. The district has number of shelling paddy and atta chakkis doing job work.

There are about 6% units in bakery products including conventional namkeens. They sell it within the district and in Amritsar. Though there is rare F &V processing facility, most of the processing units are situated in Amritsar district. There are only two vegetable processing plants in the organized sector in the district, processing tomato and pears.

There are number of individuals/ SHGs/FPOs etc. engaged in manufacture of pickles, murraba, haldi, squash, spices, etc. The district is one of the largest producers of milk There are two small to medium sized milk plants in private sector.



Graph 171: Spread of micro food enterprises in Tarn Taran district

Source: Primary Survey

4.21.4. ODOP

Pear has been selected as ODOP of the district.

Pears is a deciduous fruit, grown under a wide variety of climatic regimes, ranging from cold dry temperature hilly conditions to warm humid subtropical conditions. It is found grown in many places of India like Karnataka, Tamil Nadu, Kerala, Uttar Pradesh, Jammu and Kashmir, Punjab and Himachal Pradesh. The fruit has a milk flavor rich in phenolics. Its low acid content and low sugar content contributes to its suitability for consumption by person suffering from acidity and diabetics. Pears are a rich source of protein, vitamins and minerals like calcium, phosphorus and iron.

The area under pear is steadily increasing in North India. In Punjab, pear occupies an area of 3501 hectares with an annual production of 81892 tonnes (2019-20). With the introduction of new promising semi-soft pear cultivars, the area under pear is likely to increase further. The district tops in the production of pear amongst all districts and contribute 31% of the production of the state (2019-20). Pear farmers of Punjab mostly sell their produce to pre harvest contractors or in local Mandis through various intermediaries and rarely receive the fair price. Processing facility is not adequate in the district whereas the district has potential in processing of the fruit.

4.21.1. Non ODOP

Based on production milk, pea and fish can be potential ODOP in the district. There is a need for diversification from conventional crops to horticultural crops and allied activities to augment income of the farmers.

4.22. Patiala

4.22.1. Socio economic profile

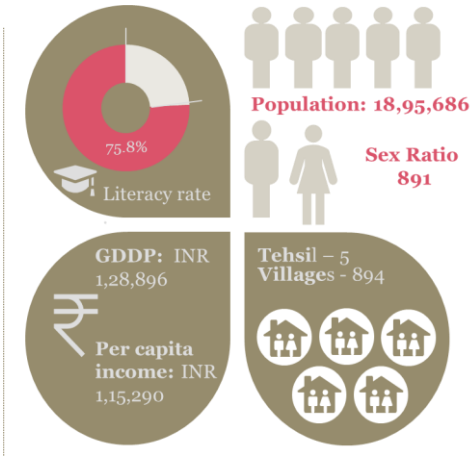
Patiala district, which is one of the famous princely states of erstwhile Punjab, lies in the south-eastern part of the State. The district is said to have been founded about 1762 AD, by Baba Ala Singh, the founder of Patiala State. The word Patiala is constituted of two words Patti and Ala, which means territories of Ala It is bounded by district Fatehgarh Sahib, SAS Nagar and Union territory of Chandigarh in north, Sangrur district in west, Ambala district (Haryana State) in east, and Jind and Kaithal districts of Haryana State in South -South west. The district Patiala forms a part of the Indo-Gangetic plain

Headquarter of the district is located in the Patiala town. The district is comprising of 5 tehsils, Patiala, Nabha, Rajpura, Samana and Patran. There are nine development blocks namely Patiala, Rajpura, Nabha, Samana, Bhunerheri, Patran, Ghanour, Shambu Kalan and Sanour. The district has 894 inhabited villages.

The district Gross District Domestic Product (GDDP) and per capita income at current price, is below the state average.

4.22.2. Demographic profile

According to the 2011 census, Patiala district has a population of 18,95,686 of which male and female population were 52.88% and 47.12% respectively. Out of the total population of the district, 59.73% residing in rural and 40.26 % in urban. The district has recorded a decadal growth rate of 19.6%. which is significantly higher than other districts. The district has density of 570 persons per sq. km. The district has a sex ratio of 891 females per 1000 males. The literacy rate of the district was 75.8%.

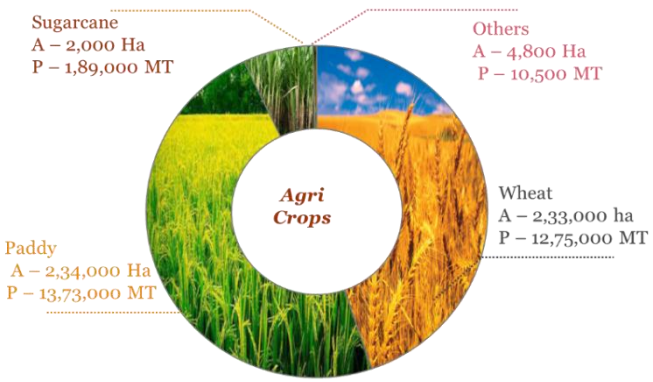


4.22.3. Climate and Rainfall

The climate of the district is classified as tropical steppe, semi-arid and hot which is mainly dry except in rainy months and characterized by intensely hot summer and cold winter. Hot winds blow during summer, occasionally accompanied by dust storms. The temperature may touch 45^0C or more on some days. Severe cold is experienced during months of December and January, sometimes the temperature touch the freezing point. The winter rains are also experienced during these months. The normal monsoon rainfall is 547 mm. Monsoon rainfall contributes 81% of annual rainfall in the district.

4.22.4. Agriculture profile

Out of the total geographical area of the district, the net sown area is 80%. The district has the cropping intensity of 199%. The whole area of the district is covered by Indo-Gangetic alluvium. Soil is rich in nutrients and suitable for growing foodgrains and vegetables. Wheat and paddy are the main Rabi and kharif crops of the district. The district is the third largest producer of the Paddy and wheat amongst all the districts. The other crops grown in the district area Sugarcane, maize, sunflower etc.

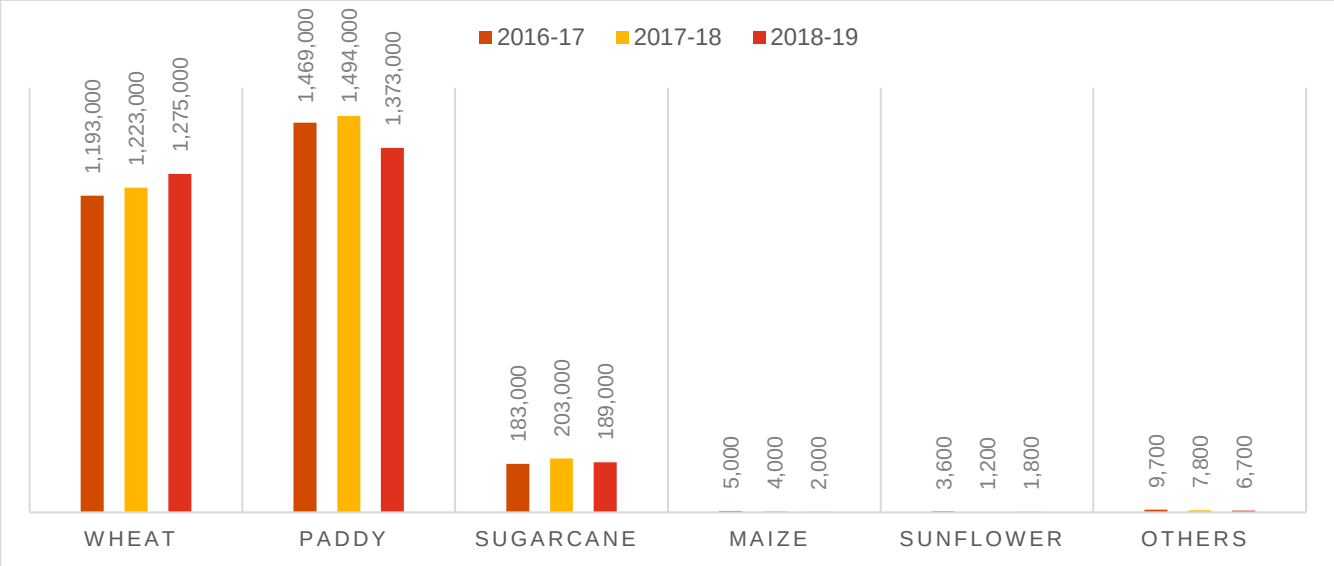


Production Trends-Agricultural crops

Production of wheat has increased in last three years whereas production of Paddy and sugarcane has decreased in the same period.

Graph 172: Major Field crops grown in district Patiala (2018-19)

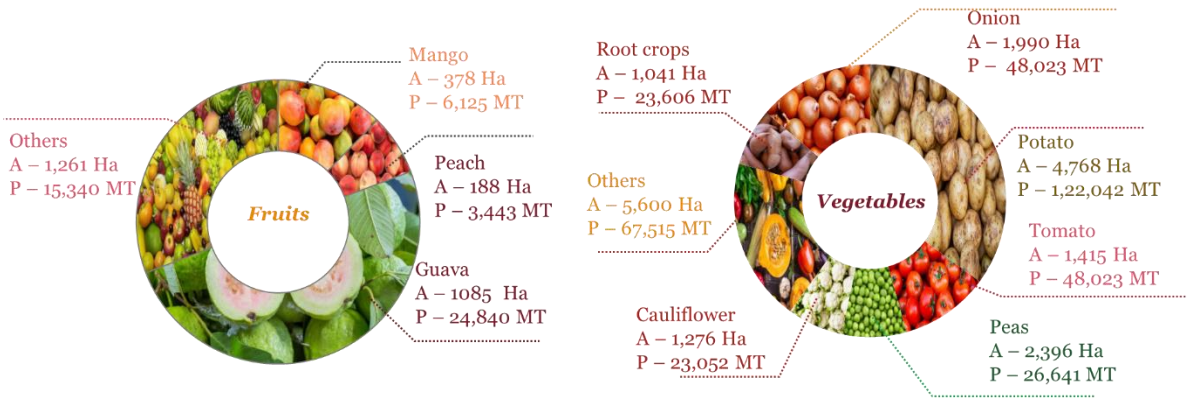
Source: Department of Agriculture, Govt. of Punjab



Graph 173: Production trends of agricultural crops in Patiala district

4.22.5. Horticulture profile

The district produces a wide range of vegetables like potato, peas, vine crops, root crops, cauliflower, tomato, chillies, cabbage, okra, etc. Overall there is cumulative growth of 8% in the area under vegetables in last four years (from 2016-17 to 2019-20). District Patiala has the second highest area under onion with 1990 Hectare (2019-20) in the state. Out of all vegetables in the district, maximum area is under Potato.

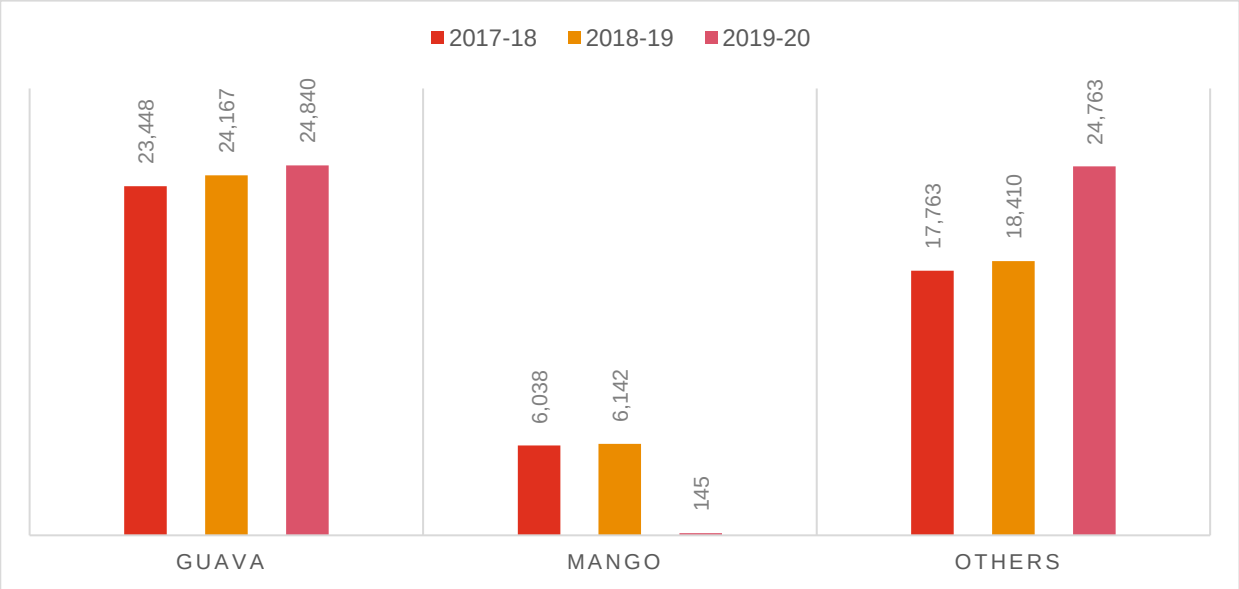


Graph 174: Major Fruits and vegetables crops grown in district Patiala (2019-20)

The district produces a wide variety of fruits like guava, mango, ber, pear etc. The district Patiala tops in the production of guava in Punjab. The area under guava is maximum in the district. During the period from 2016-17 to 2019-20, the area under fruit crops is reported a cumulative growth of 26%. Department of Horticulture has is planning to set up Guava Estate at Wazidpur, Patiala to improve the quality and productivity of Guava.

Production trends-fruits

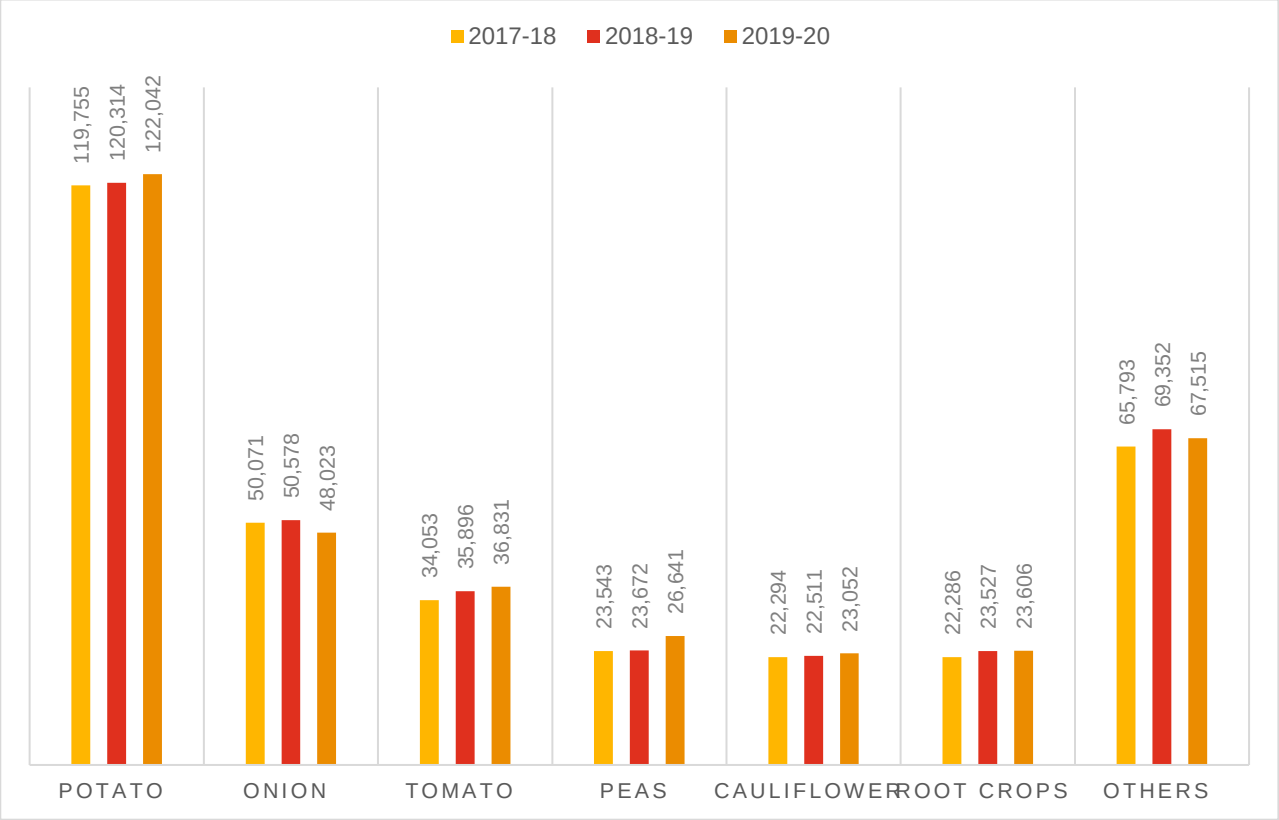
Production of guava and other fruits like peach, pear, kinnow has increased over the years. However production of Mango has decreased.



Graph 175: Production of trends of fruits in Patiala district (MT)

Production trends-vegetables

Production of potato, tomato, root crops and peas have increased in last three years however production of onion and cauliflower has decreased in the same period.

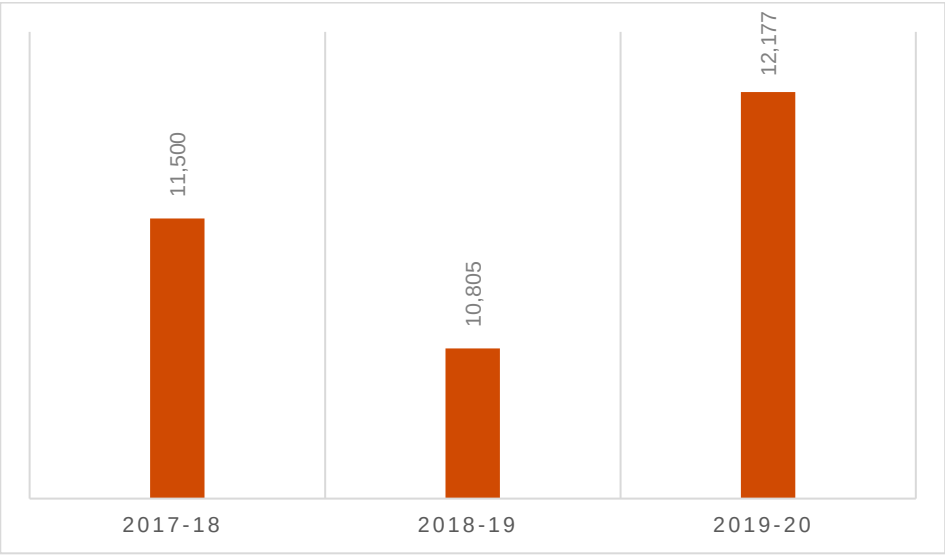


Graph 176: Production trends of vegetable crops in Patiala district (MTs)

4.22.6. Allied activities

Production trend- Fish

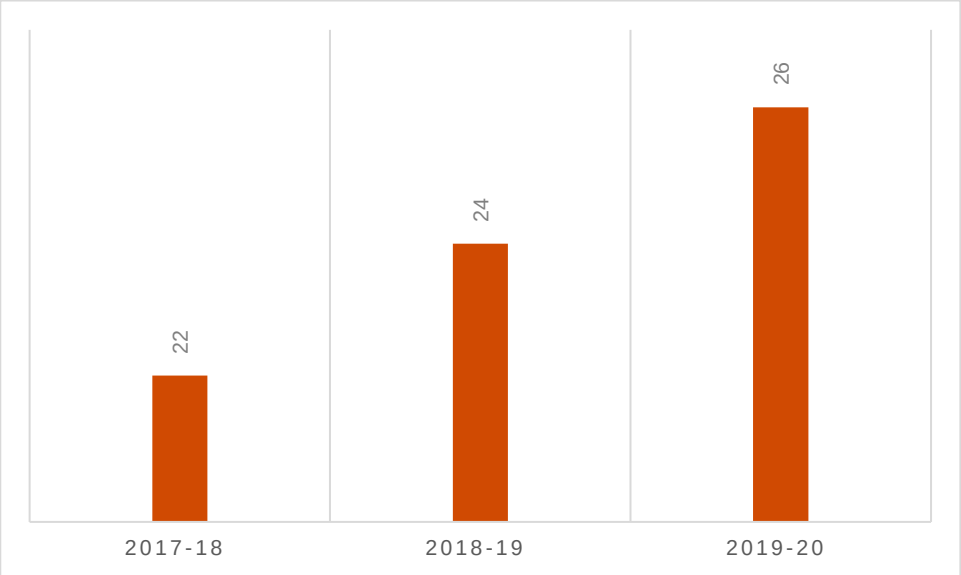
The district Patiala is the **highest producer of fish amongst all districts in the state with production of 12,177 MT during 2019-20**. During last three years, the district recorded a cumulative growth of 6%. The farmers grow carp and pangas varieties of fish.



Graph 177: Production trend of Fish in Patiala district (MT)

Production trend- Milk

District Patiala is the highest producer of milk (26 lakh litre/day) in the state. There are 3 to 4 medium sized milk processing plants manufacturing pasteurized milk, butter, paneer, curd and other value added products.



Graph 178: Production trend of milk in Patiala district (LLPD)

4.22.7. Industrial profile

There were 5048 registered Micro Small enterprises in the district and 31 registered medium and large enterprises providing employment to 41233 and 11960 persons respectively, as per FY 2014-15.

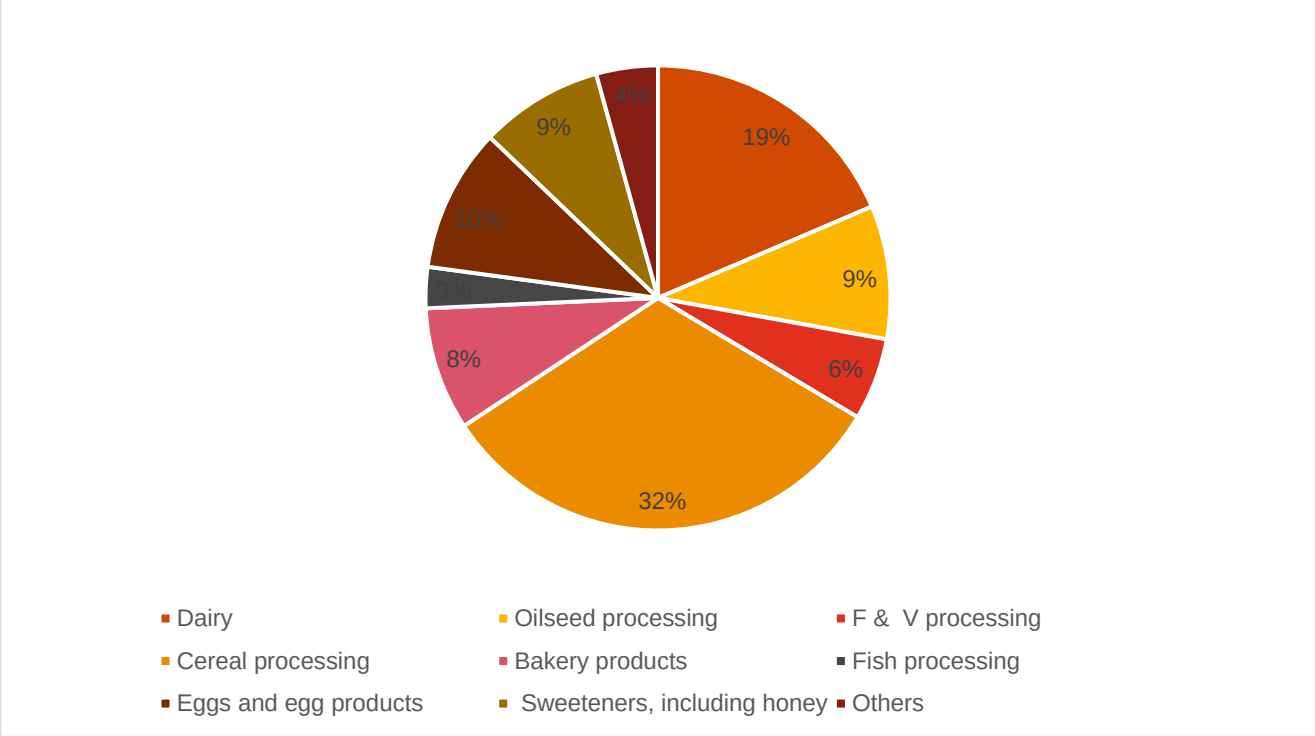
Table 28 Industry in Patiala

Industry at a Glance (2014-15)			
Sr. No.	**Head**	**Unit**	**Particulars**
1	Registered Micro & Small Units	No.	5048
2	Registered Medium & Large Units	No.	31
3	Employment in MSE Sector	No.	41233
4	Employment in Large and Medium Industries	No.	11960
5	No. of Industrial Areas	No.	5
6	Turnover of MSE Sector	Rs. Lakh	262064.062
7	Turnover of Large & Medium Sector	Rs. Lakh	329384.20

In the district there are more than 700 rice mills (avg. capacity 2 MT/hr) shelling common variety of paddy for state procurement agencies, over 1,200 atta chakkis and about 25 mini flour mills manufacturing non-branded wheat flour and other products. There are about 10 to 12 micro enterprises/individuals, processing *sarson* (oil expellers) to mustard oil and cotton seed to crude edible oil. There are number of FPOs/SHGs and individual micro enterprises in the district engaged in the manufacture of pickles, murraba,haldi, sherbet, chutneys, rose water, fruit wine etc.

District Patiala is the highest producer of milk amongst all districts of the state. Milked unit handles 1.50 LLPD of milk. There are 3-4 medium sized milk processing plants manufacturing pasteurized milk, butter, paneer, curd and other value added products, over 200 micro enterprises/individuals processing 500 litre to 5,000 litre per day

of milk to manufacture paneer, pasteurized milk, khoya, curd, cream, sweet meat, etc. for local sale. there are over 300 bakeries and savouries units and over 95% of these units are unorganized and informal.



Graph 179: Spread of micro food enterprises in Patiala district

Source: Primary Survey

4.22.8. ODOP

Guava has been selected as ODOP of the district.

Patiala district has the highest production of guava and area under cultivation is also highest in guava. Per hectare average yield of guava in Punjab stands at 22.57MT. The total production of guava in Patiala stands at 24840MT with 1085 hectares of area under cultivation of guava in the district. Patiala is closely followed by Ludhiana with a total production of 23691MT and 1031 hectares of area under cultivation in the district[77].

Guava cultivation has been promoted by the department of horticulture in the district. With the impetus of department of horticulture area under Guava cultivation in the district has increased from 945 ha in 2015-16 to 1085 ha in 2019-20. Production of Guava has increased at a CAGR of 3% in last five years. Commonly grown varieties in

Patiala and Nabha are major Guava producing blocks in the district. Ghanour and Rajpura are third and fourth largest Guava producing blocks in the district. Nabha has maximum yield per plant compared to other Guava growing blocks in the district. There are three government fruit nurseries situated at Patiala, Nabha and Wazidpur. Government is also setting up Guava estate at village Wazidpur to promote Guava cultivation in the district.

PAU has a regional research station for fruits at Bahadurgarh, Patiala. Research station has a focused approach on research and development of Guava's production technologies and nursery production.

KVK Patiala conducts training and capacity building of the farmers on production technologies, improved package of practices, nursery production, post-harvest management. KVK also distributes fruit fly trap to Guava farmers to control fruit fly infestation in the Guava orchards. During our interaction with the KVK scientists, they informed

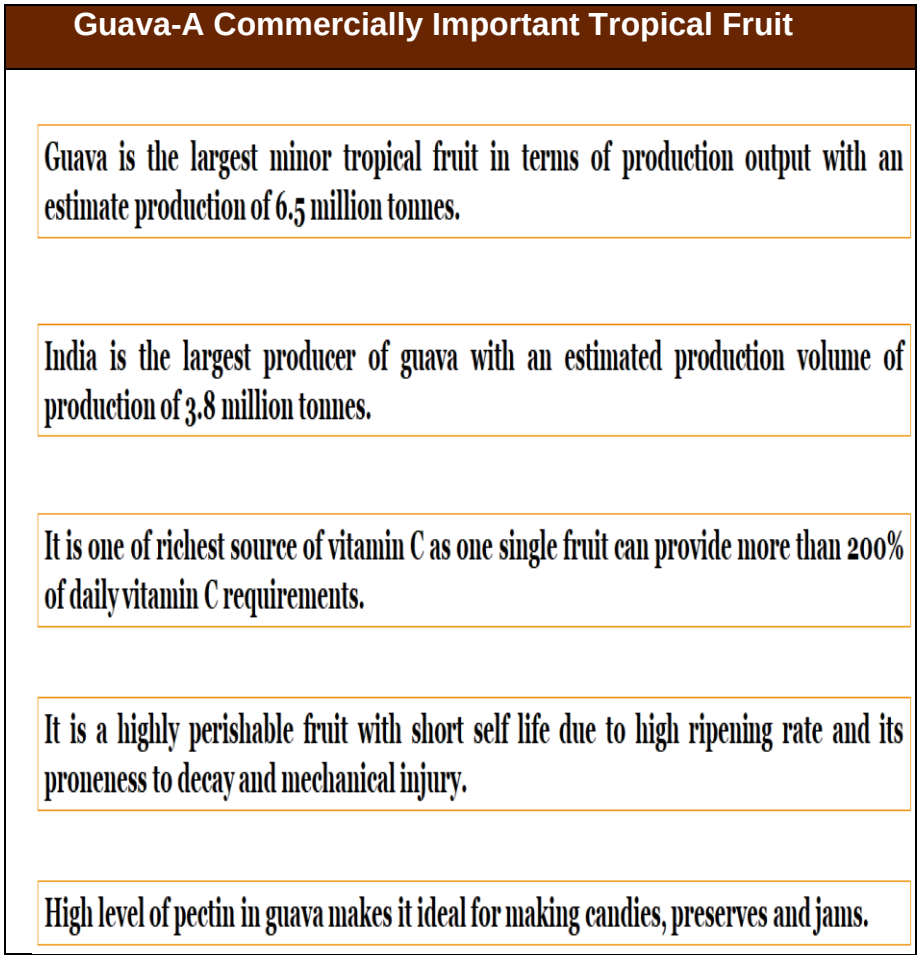
[77] Department of Horticulture, Government of Punjab

potential for Guava processing in the district. Currently, Guava produced is sold for table consumption to local traders, who further sell it to different districts in Punjab and Delhi NCR.

During the interaction with the farmers, it was found that accessibility of quality planting material is a challenge for expansion of area under Guava cultivation in the district.

Guava is a tropical fruit which are of round or pear shaped and cultivated in tropical and sub-tropical regions of the world. It is generally consumed fresh and is one of the most popular fruit across the world. There are multiple species of guava which are cultivated in different countries of the world. The most cultivated and commercially traded species of the guava is apple guava (*Psidium Guajava).* Guava tree starts giving fruits in two years when grown from the seed. The size of the guava fruits ranges between 4 to 12 centimeters depending on the species. When immature and until a very short time before ripening, the fruit is green, hard, gummy within and very astringent.

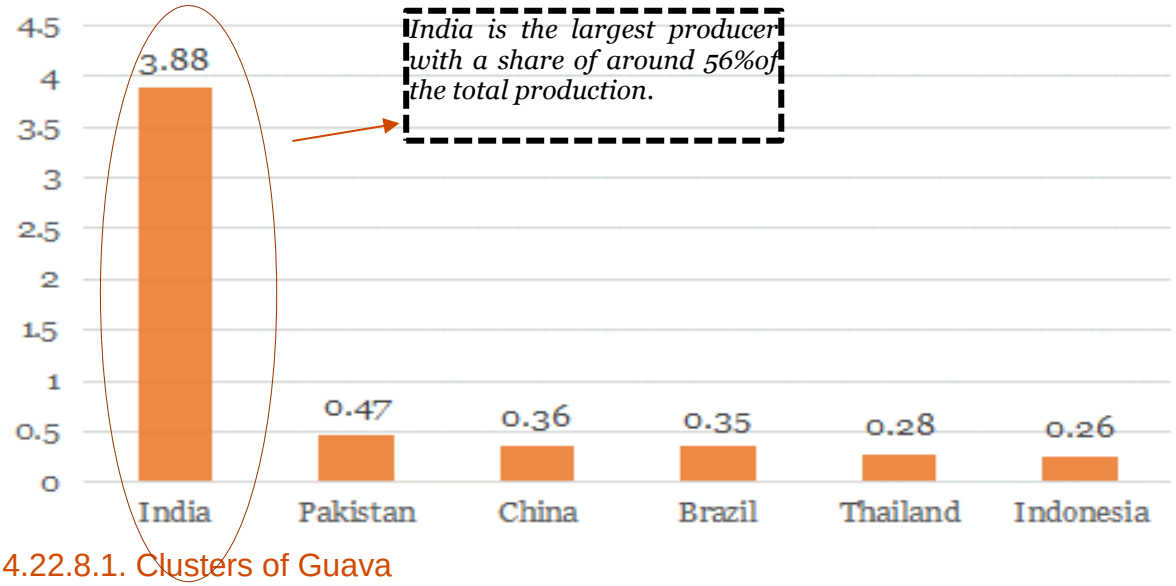
They have pronounced and typical fragrance which can be easily differentiated. Guavas are a great source of vitamin C and dietary fiber. Although nutrient contents varies across the species, a single guava fruit can contain 257% of the daily requirement of vitamin C. Such a high content makes it one of the richest source of vitamin C. Other than being a great source of vitamin C, guava is fairly rich antioxidants and contains significant amount of magnesium, potassium, calcium, and vitamin A. It is an immunity booster fruit and helps in controlling blood sugar level.



It grows well in plain and sub-mountainous region and the optimum temperature for guava production ranges between 23 °C and 28 °C. Guava fruit can tolerate high temperature and drought, but young plants can get killed by the severe frost condition. Average annual rainfall of 1000 to 2000mm augurs well for the guava cultivation provided it does not coincide with the flowering and harvesting seasons. It can grow well in any type of soil ranging from alluvial to laterite except severely waterlogged soil. Well drained soils are best for the commercial cultivation of guava. It is a highly perishable food with short self-life and can get bruised easily. The total

production of Guava is estimated to be around 6.5 million tonne[78]s with India being the largest producer in the world. India produces around 50% of the total production volume of the guava. Other major producers are China, Brazil, Pakistan and Egypt.

Guava: Production Across the World[79]



4.22.8.1. Clusters of Guava

4.22.8.1.1. National clusters:

Most of the guava produced in India are consumed domestically with very small volume being exported to countries like US, EU, Saudi Arabia, Kuwait and Jordan. The popular varieties of guava grown in India are Sardar, Allahabad Safeda, Lalit, Pant Prabhat, Dhareedar, Arka Mridula, Khaja (Bengal Safeda), Chittidar, Harija. Some hybrid varieties like Arka Amulya, Safed Jam and Kohir Safeda have been also developed and grown in the country. Allahabad safeda and Sardar are the two major variety with high share in total guava production. Both the variety have high yielding capacity and are accepted all over the world.

Allahabad Safeda: *It is one of the most famous and demanded variety, which is used for both table and processing purpose. The fruit is round in shape and not very large.*

Sardar: *Fruits of this variety are large and huge in size as compared to Allahabad safeda. Seeds are in bounty and harder than Allahabad safeda.*

Lalit*: It is a hybrid variety of high yielding pink fleshed guava developed by central institute of subtropical horticulture Lucknow. It is suitable for both table purpose and processing.*

Punjab Pink: *Fruits of this variety are of medium to large size and skin color is golden yellow summer season. Flesh of fruit is of red color with pleasant flavor. It gives high average yield of 155kg per tree.*

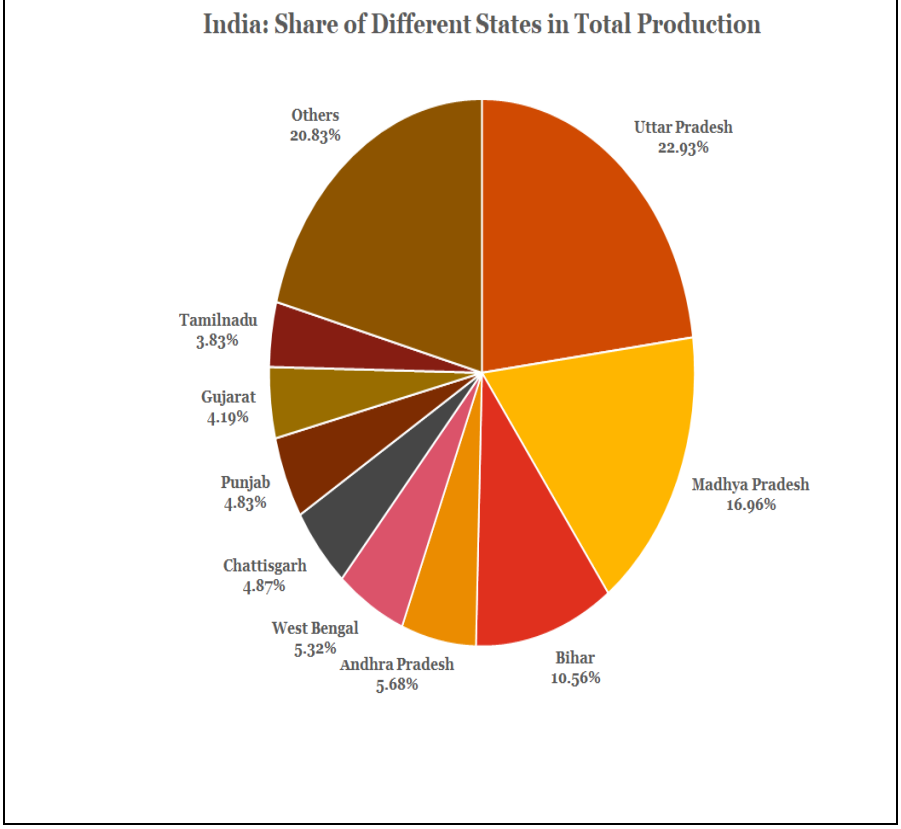
Punjab Safeda*: Flesh of this variety is creamy and white with strong flavor. Fruits are of medium to large size.*

[78] *Minor Tropical Fruit: A Paper by FAO*

[79] *Minor Tropical Fruit: A Paper by FAO*

As per estimates, guava is the fourth most widely grown fruit crop in India. Total area under guava cultivation in India is estimated to be around 287,000 hectare with Uttar Pradesh being the largest producer state. Other major producer states are Madhya Pradesh, Bihar and Andhra Pradesh.

India: Guava Production and Share of Different States[80]



4.22.8.1.2. Clusters within the state: Patiala

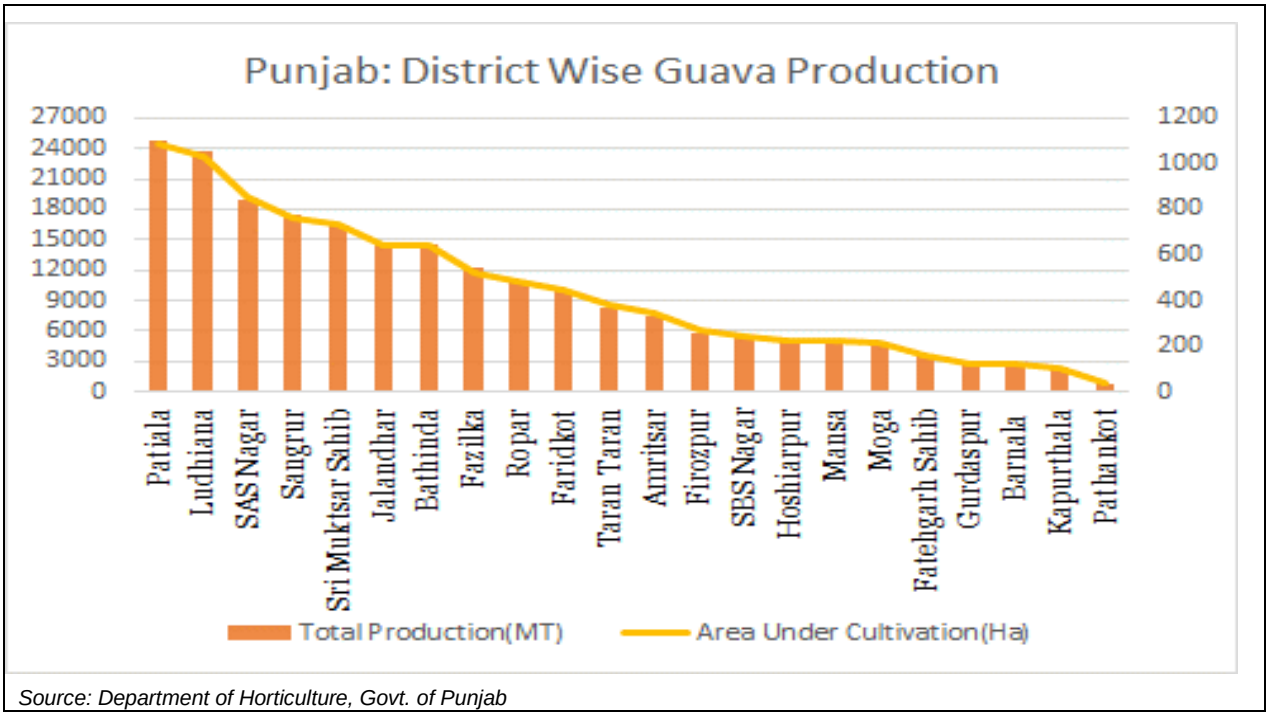
Punjab comes at 7th rank in India in terms of guava production with a share of 4.83% in total production of the state. The total production of guava in the state stands at 217738 MT and the total area under cultivation of guava in the state is 9645 hectare[81].

Patiala, Ludhiana, SAS Nagar, Sangrur, Sri Mukatsar Shahib, Jalandhar, Bhatinda and Fazilka are major Guava producing districts.

Patiala district has the highest production of guava and area under cultivation is also highest in guava. Per hectare average yield of guava in Punjab stands at 22.57MT. The total production of guava in Patiala stands at 24840MT with 1085 hectares of area under cultivation of guava in the district. Patiala is closely followed by Ludhiana with a total production of 23691MT and 1031 hectares of area under cultivation in the district[82].

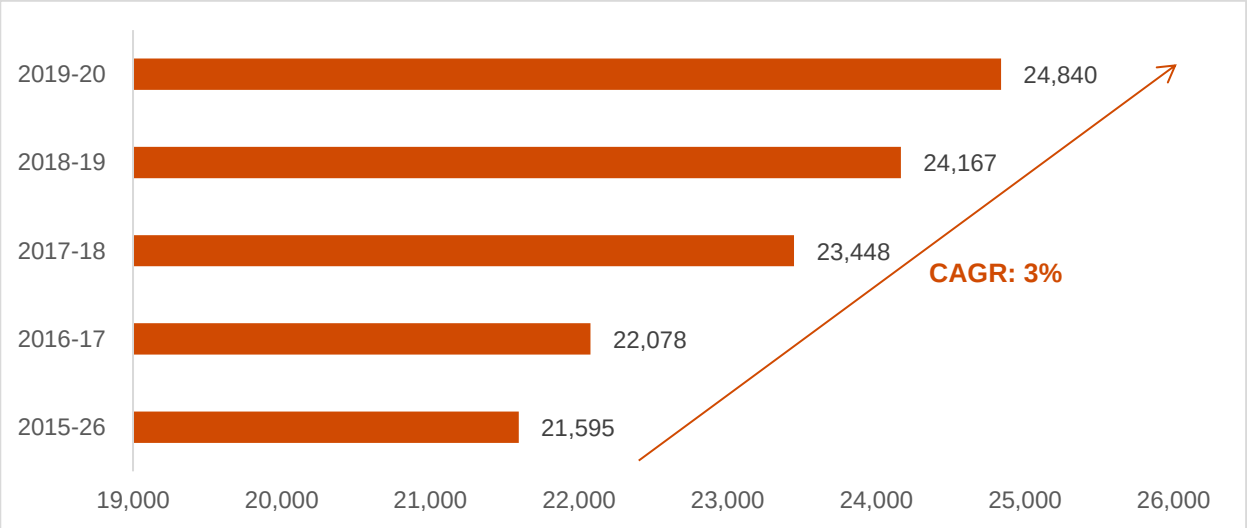
Punjab: District Wise Guava Production[83]

[80] *Area Production Statistics 2019-20: National Horticulture Board*
[81] *2019-20 Agriculture and Horticulture Statistics: Dept of Horticulture, Punjab*
[82] Department of Horticulture, Government of Punjab
[83] *2019-20 Agriculture and Horticulture Statistics: Dept of Horticulture, Punjab*



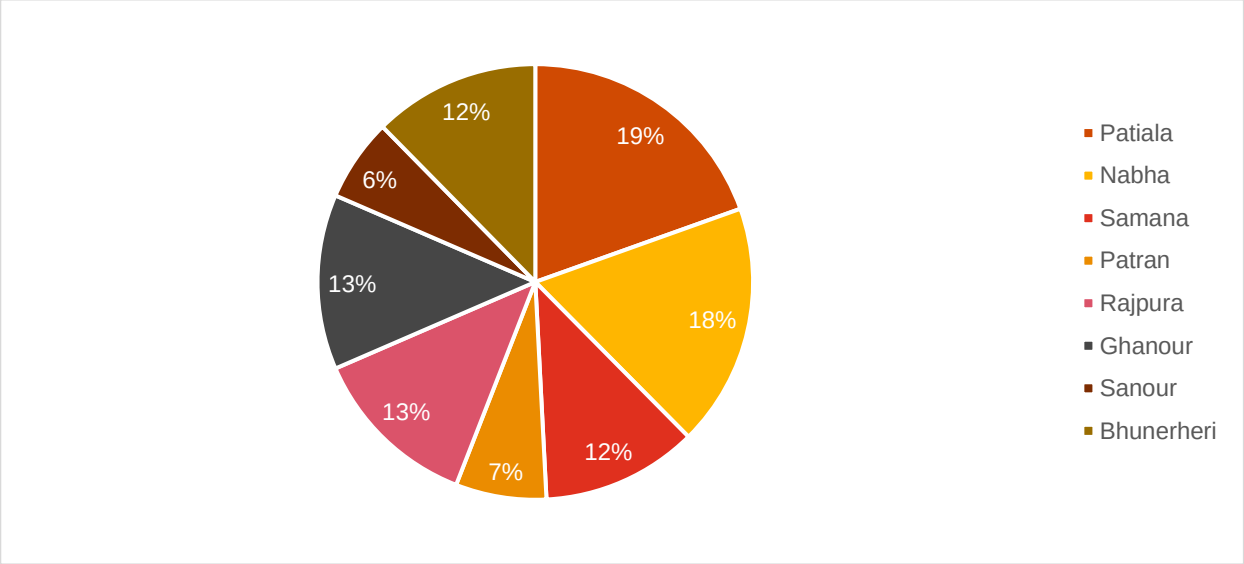
Source: Department of Horticulture, Govt. of Punjab

Guava cultivation has been promoted by the department of horticulture in the district. With the impetus of department of horticulture area under Guava cultivation in the district has increased from 945 ha in 2015-16 to 1085 ha in 2019-20. Production of Guava has increased at a CAGR of 3% in last five years. Commonly grown varieties in the district are Allahabad Safeda, Hissar Safeda, Sardar and Hissar Surekha.



Graph 181: Guava production in Patiala district (MT)

Patiala and Nabha are major Guava producing blocks in the district. Ghanour and Rajpura are third and fourth largest Guava producing blocks in the district. Nabha has maximum yield per plant compared to other Guava growing blocks in the district. There are three government fruit nurseries situated at Patiala, Nabha and Wazidpur. Government is also setting up Guava estate at village Wazidpur to promote Guava cultivation in the district.



Graph 182: Block wise contribution in Guava cultivation

PAU has a regional research station for fruits at Bahadurgarh, Patiala. Research station has a focused approach on research and development of Guava's production technologies and nursery production.

KVK Patiala conducts training and capacity building of the farmers on production technologies, improved package of practices, nursery production, post-harvest management. KVK also distributes fruit fly trap to Guava farmers to control fruit fly infestation in the Guava orchards. During our interaction with the KVK scientists, they informed potential for Guava processing in the district. Currently, Guava produced is sold for table consumption to local traders, who further sell it to different districts in Punjab and Delhi NCR.

During the interaction with the farmers, it was found that accessibility of quality planting material is a challenge for expansion of area under Guava cultivation in the district.

4.22.8.2. Turnover & employment

The district of Patiala has no dedicated processing unit for Guava, so details of turnover and employment cannot be furnished.

4.22.8.3. Socio economic profile of the ODOP producers

Most of the Guava growers in the district are small and marginal farmers with average landholding of 2 acres. Though as per interaction with the farmers and other stakeholders it was found that most of the orchards are given on lease to manage by the orchard owners. The orchard also handover the orchards to pre-harvest contractors at flowering stage only.

4.22.8.4. Infrastructure and technology

Patiala district is well connected by road and rail network to nearby districts of Punjab and states like Haryana and Delhi NCR. Other infrastructural aspect like power availability, transportation is also good as the state as a whole has one of the best infrastructures in the country. Although the basic infrastructure available in the district is good for trade of Guava but the district lacks packhouses for primary processing and secondary processing units for Guava. Most of the Guava produced is marketed for table consumption in Patiala or Ludhiana. From Ludhiana further it is sold to Delhi NCR market. Some of the micro enterprises in the district are processing Guava at a very small scale mainly manually. Some of the microenterprises we met were making pickles, jam and jelly of Guava at household level. One entrepreneur has tried manufacturing guava wine, but he failed to market it due to limited demand in the state. Due to lack of primary and processing infrastructure in the district post-harvest losses are high. As per the stakeholder interaction it was evident that there is a dire need to promote processing of Guava in the district.

4.22.8.5. Human resource and skill set

As Guava processing is meagre in the district skilled manpower availability is a challenge. Though Krishi Vigyan Kendra, Patiala situated at Nabha road mentored by Punjab Agricultural University is conducting various capacity building program for farmers and microenterprises for post-harvest management and processing off Guava.

4.22.8.6. Institutional support and support infrastructure

KVK is providing training for processing of Guava in the district. Regional research station in Patiala is having focus on research and development of Guava. This has given impetus to Guava production in the district. However, the existing support infrastructure for production gives immense opportunity for Guava processing in the district.

4.22.8.7. Financial linkages

Due to lack of collateral, availing finance from banks/financial institutes is a challenge for micro food enterprises. Though SHGs and FPOs through special schemes have upper edge to avail finance for various activities. Most of the nationalized banks and scheduled commercial banks have branches in the district. State Bank of Patiala is the lead bank of the district.

4.22.8.8. Product cost analysis

As processing activities for Guava value addition is not currently done in the district hence this section cannot be covered.

4.22.8.9. Value chain analysis

As per stakeholder interaction in the district, the marketing surplus in for guava is estimated to be around 98%. The marketing of the guava is done through various channels. Most widespread channel is to enter into a pre harvest contract with the contractor by the grower. Other than this, marketing is done through commission agents who facilitate the selling to wholesalers or retailers. Broadly, following channels are used for the marketing of guava.

8. *Producer---Pre-Harvest Contract---Wholesaler(Through Commission Agents)---Retailers----Consumer*
9. *Producer---Wholesaler(Through Commission Agents)---Retailers---Consumer*
10. *Producer---Retailer(Through Commission Agents) ----Consumer*
11. *Producer---Consumer*

Maximum transaction happens through first two channels. The share of producer in consumer's rupees is highest in channel 4, but transactions happening through this channel are negligible due to its limited potential for high volume marketing.

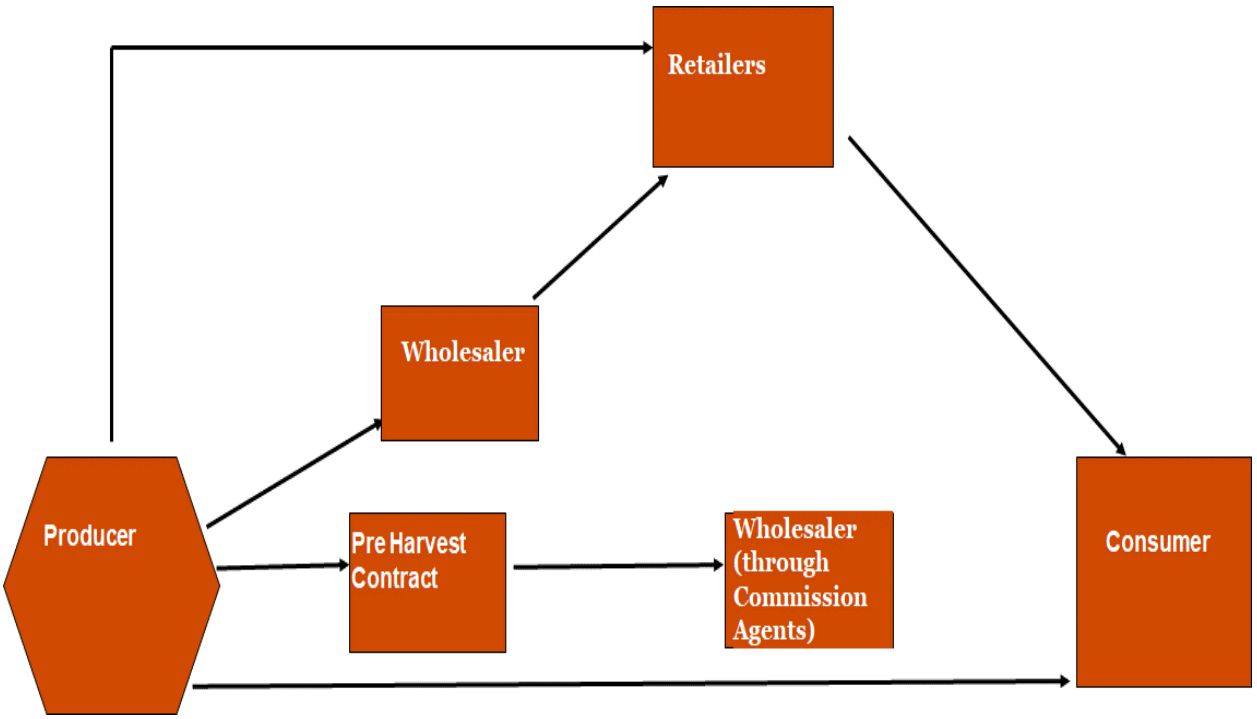


Figure 18: Guava marketing channels

Marketing Costs

Marketing costs are the actual expenses incurred in bringing goods and services from the producer to the consumers. The marketing costs normally include;

- Commission and market fees
- Handling Charges at local points
- Transport and storage charges
- Handling charges by wholesaler and retailer

In Punjab, market fee for fruits, vegetables and grains are same but commission charges in vegetables are greater than grains. Tentative market fees, commission charges and taxes on guava in Punjab are described below in the table:

Table 29: Marketing cost

S. No	Particulars	Charges (%)
1	Market Fee	2%
2	Commission Charge	5-6%
3	Rural Development Fund	2%
4	Miscellaneous Charges (Handling, weighing, loading, unloading, cleaning etc.)	3-4%

Source: Primary Survey

Price discovery by intermediaries

The price determining mechanism is briefed below:

- **Pre harvest contract:** Pre harvest contract is entered by the growers with contractor on the basis of estimated production volume and prevalent market prices for the fruits. Contractor is responsible for incurring the expenses in harvesting and other expenses
- **Auction through commission agents:** Fruit is auctioned at the market yard and auctioning process is facilitated by the commission agents. The price is generally determined by the demand and supply situation.
- **Wholesalers and retailers:** They generally work on markup basis and final consumers negotiate the price. Wholesaler do the markup through by adding his required margin.

Marketing Margin

Total marketing margin is cost involved in moving the guava from producer to consumer and profit of various market functionaries. Absolute value of the total marketing margin varies from market to market, channel to channel and time to time. The prices of guava and farmer's share in consumer's rupee varies inversely with the length of the marketing channel. Price build up (based on the assumption) in guava is described in table below:

Table 30: Marketing margin in Guava

S. No.	Particulars	% Share to consumer Rupee
1	Net price received by producer	50-55%
2	Marketing cost paid by producer	7-8%
Farmers sale price		**57-58%**
3	Handling charges, commission, market fee, losses etc.	8-10%
Wholesaler's Purchase Price		**65-68%**
4	Wholesaler's Margin @10%	10%
Wholesale price in the market		**75-78%**
5	Retailers Charges on handling, losses@ 10%	7-8%
Retailer's Purchase Price		**82-85%**
6	Retailers Margin @15%	15%
Consumers purchase price or Retailer's sale price		**100%**

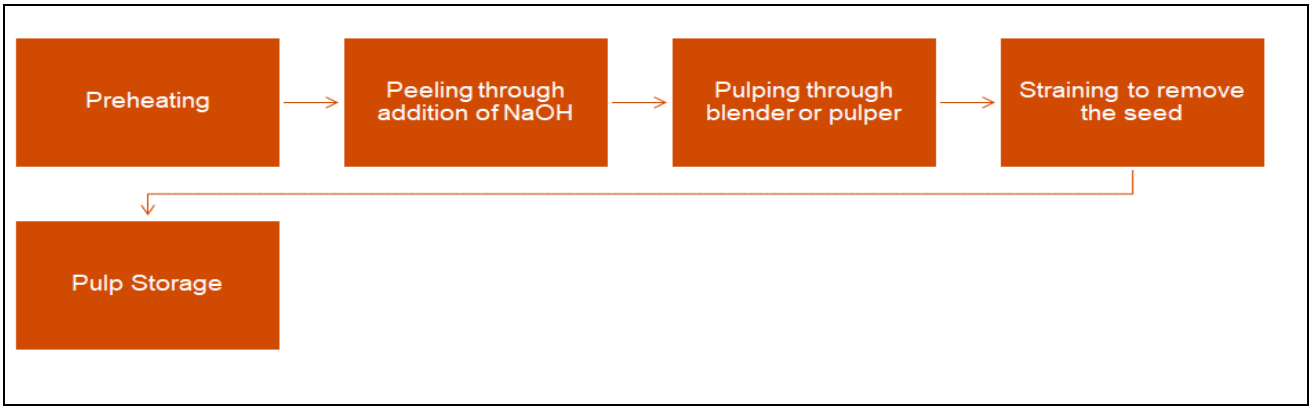
4.22.8.10. Value added products of Guava

4.22.8.10.1. Products & by products of Guava

Due to its ease of cultivation, high nutrient content and ease of processing into various industrial products, guava fruit has great potential for making variety of value-added products through processing. Major products obtained through guava processing are guava pulp, jam, juice, jelly chocolates, wine and guava powder. Following is the description of major value-added products obtained from guava processing.

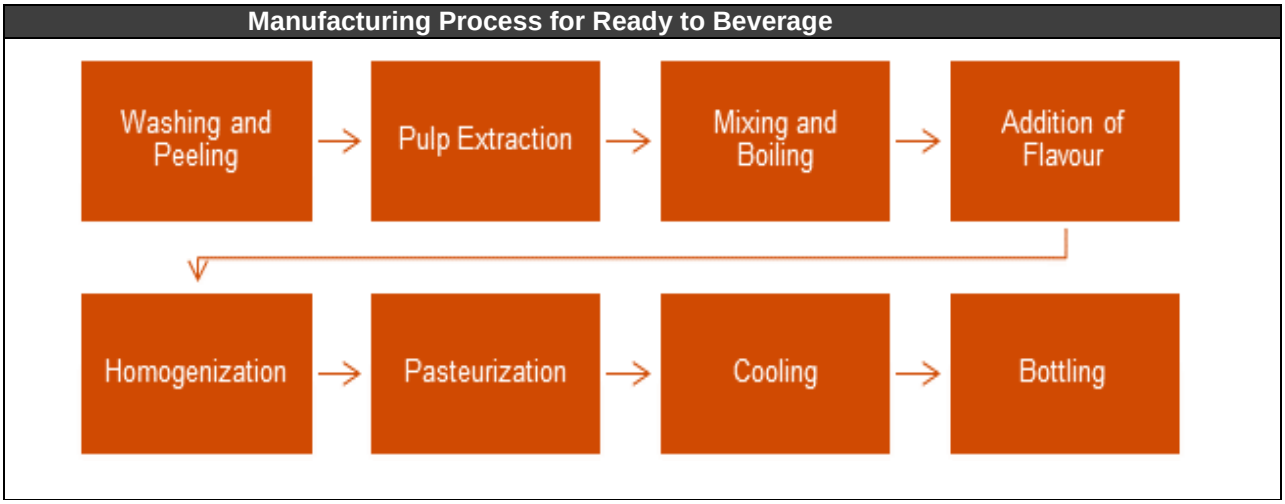
Guava Pulp:
Guava pulp is a convenient form guava fruit preservation, which can be preserved by addition of potassium metabisulphite at low concentrations. Following are the steps involved in manufacturing.

Extraction of Guava Pulp



Ready to Serve Guava Beverage

Ready to serve guava beverage is made from guava pulp and have huge potential for marketing as consumption of ready is increasing. It is made from extracted pulp by boiling and homogenization. Flavors are also added to the beverage during manufacturing process.



Guava Jams and Jellies

Guava jams and jellies are produced through cooking of pulp after adding of sugar, jellifying substances and other suitable additives for achieving the desired consistency. Slightly ripened fruits are best for processing into guava jellies. The fruits are first cut into small pieces and boiled for about 45 minutes. After that the juice is extracted by filtration using strainers or clean muslin clothes. Further processing involves addition of sugars to the extracted juice after which the mixture is boiled to 105°C or formation of a sheet when a small portion is cooled off in a spoon. The amount of sugar used depends on the pectin levels of the extracted juices This is followed by hot filling into clean and sterilized jars.

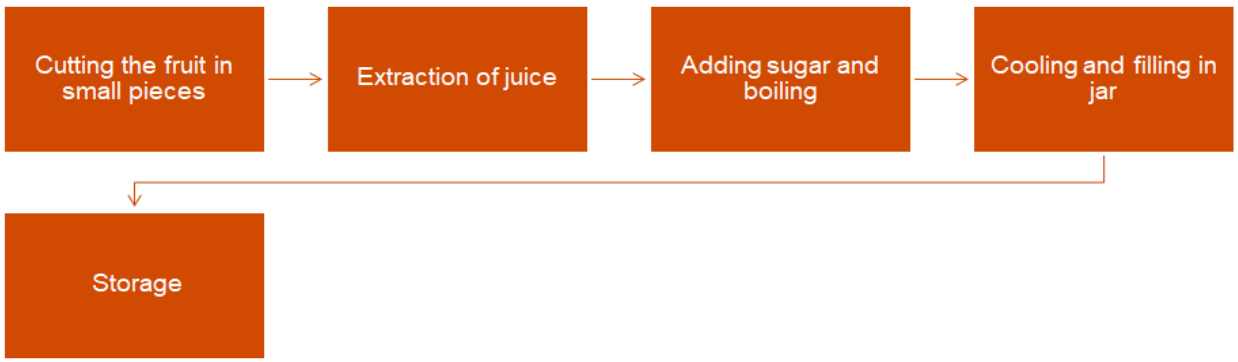


Figure 19:Guava Jelly Manufacturing Process

Dehydrated Guava Products:

Drying results in preservation of fruits through reduction of the moisture content as it inhibits growth of microorganisms by preventing enzymatic reactions. There are various drying methods including sun and solar drying. Sun drying results in contaminated and poor-quality products as compared to products obtained through osmotic dehydration, vacuum, freeze and spray drying techniques. Sun drying causes up to 84% losses in the heat labile nutrients such as ascorbic acid and the water-soluble vitamins such as thiamine and niacin therefore limiting its application as a suitable preservation method. Osmo-dried guava slices are made from guavas of around 1.5cm thickness which are dipped in sugary syrups of 0.05% potassium metabisulphite and citric acid. It results in decrease in the moisture content and increases in solid and sugar levels that have preservative effects. The method does not have adverse impact on appearance of the guava slice and their flavor.

4.22.8.11. Packaging and storage life

Guava is generally packed in baskets which are made from locally available plant material. Wooden or corrugated fibre board boxes are used along with cushioning materials viz. paddy straw, dry grass, guava leaves or rough paper for distant market. Good ventilation is important to avoid build-up of heat. Guava is a delicate fruit which requires careful handling during harvesting and transportation.

4.22.8.12. Tests done for the product

Qualitative tests

Following tests are required to be conducted for Guava fruit;

1. **Total Solids:** Procedure same as described in analysis of mango
2. **Total soluble solids (TSS):** Procedure same as described in analysis of mango
3. **Determination of pH Value:** Procedure same as described in analysis of mango
4. **Determination of Total Sugars:** Procedure same as described in analysis of mango
5. **Determination of Ascorbic Acid (Vit-C):** Guava is an excellent source of vitamin C (299 mg/100 g). The amount of ascorbic acid is determined by 2,6- Dichlorophenol-indophenol Visual Titration Method.

Reagents used: 3 % metaphosphoric acid solution, standard ascorbic acid solution and 2, 6 Dichlorophenol-indophenol dye solution.

First, standardization of dye is done by titrating the standard ascorbic acid solution with dye solution to determine dye factor. Then, 5-10 gm of sample is weighed and 30-35 ml of 3% metaphosphoric acid is added and centrifuged at 10,000 rpm for 10 min. Then aliquot of 10 ml is taken and titrated against the dye solution. Triplicate readings are taken for each sample and the ascorbic acid calculated using the following formula: -

$$\text{Ascorbic acid}\left(\frac{\text{mg}}{100\text{gm}}\right) = \frac{\text{Titre value} \times \text{Dye factor} \times \text{volume makeup} \times 100}{\text{Aliquot of extract taken} \times \text{Wt. or volume of sample taken}}$$

4.22.8.13. Identified gaps

4.22.8.13.1. Firm level

As we have already discussed that there are very few units in Guava processing in the district, technical know-how about Guava processing is lacking. Gaps and recommendations are summarized based on stakeholder interaction in the district.

	Sectors	Gaps	Recommendations	Costing
1	Skill training needs	Lack of technical know how about post-harvest management and	Training and capacity building on topics like post-harvest management, food safety and hygiene, better manufacturing	

	Sectors	Gaps	Recommendations	Costing
		processing of Guava.	practices, marketing and branding etc. in association with KVK, Patiala, regional research station of PAU, SLTI and DLTIs Along with training and capacity building exposure visits to Guava processing units or pilot plants in universities/technical institutes may be arranged. In collaboration with CFTRI, NIFTEM, IIFPT, CIPHET, Indian Institute of Packaging and PAU knowledge about innovative technologies available for Guava processing can be disseminated to the micro enterprises in the form of seminars/workshops/exposure visits along with development of IEC materials	
2	Manufacturing practices	As Guava processing is new for micro food enterprises no standard guava processing practices are followed. Manufacturing skills of value added products is lacking among micro food enterprises in the district		
3	Technologies	As processing of Guava is meagre in the districts, there is a lack of know how about technologies available for Guava processing		
4	Access to finance	Due to lack of collateral, availing finance from banks/financial institutes is a challenge for micro food enterprises. Though SHGs and FPOs through special schemes have upper edge to avail finance for various activities.	Regular follow ups with SLBCs and DLBCs for supporting micro food enterprises to have access to finance can be done by SNA and DRPs. Frequent meetings with district lead bank to sensitize them about PMFME scheme can be done by DRPs.	No cost involved
5	Access to mentorship/service	Lack of access to mentorship/services for food processing is available for the micro food enterprises in the district	In collaboration with food processing based incubation centres mentor mentee programmes can be arranged for the interested micro food enterprises in the district	

4.22.8.13.2. Cluster/district level

Based on stakeholder interaction with farmers, traders, micro food enterprises, scientists, retailers, government officials following gaps have been identified.

Infrastructure	Gaps
A) Public Infra	Public infrastructure to support food processing industries is good in the district.
B) Common facilities	No common facilities available for primary or secondary processing of Guava in the district
C) Testing facilities	Inadequate food testing facilities available in the district
D) Safety standards	Unawareness about food safety standards of processed food products among micro food enterprises.

4.22.8.14. SWOT analysis

As mentioned earlier, guava has been selected as ODOP for the Patiala district. Following is the SWOT analysis for the guava in these districts.

SWOT Analysis	
Strengths: • High volume of production in the district. • High market surplus for the marketing of fruit. • Proximity to important urban centres.	**Weakness:** • Increasing cost of production due to high input cost • Highly perishable nature of the fruit. • Limited processing opportunities in the district.
Opportunities: • Untapped potential for processing opportunities. • Opportunities for export of the processed product. • Enterprising spirit of the people.	**Threats:** • High fluctuation in prices due to demand supply mismatch • Lack of efficient market channels for the marketing of fruit.

4.22.8.15. Way Forward: Areas of interventions & suggestions

Guava processing is minimal in the district, with increasing production and area under the crop with the support of Department of Horticulture opens up new avenues in terms of processing. Through stakeholder interaction it is clearly evident that Guava is mostly sold for table consumption to traders in the district or Ludhiana. Hence, there is a wide scope of capacity building of farmers and microenterprises in post-harvest management, processing. Various components of PM FME scheme can be leveraged to catapult the industry to higher level. From the detailed discussions with the various stakeholders in the district, we are proposing various intervention for the development of ODOP based industry in the district

4.22.8.15.1. Establishment of incubation centre

Incubation centre is a type of common infrastructure which can be established under the scheme. As per the guidelines, the incubation centre should involve one or more product lines which could be utilized by the smaller units on a hire basis for processing of their produce.

As we understand through various stakeholder interaction minimal processing of Guava produced takes place in the district. Hence, incubation centre will act as a pilot centre for the micro food enterprises to venture into the processing of Guava. Different lines of guava processing like integrated packhouse with ripening chambers, guava pulp manufacturing line along with Guava juice manufacturing can be proposed. This will help

microenterprises to incubate at the centre and then after developing confidence in the processing microenterprises can venture into processing themselves.

The incubation center can also carry out the training and capacity building for the micro food enterprises and Self-Help Groups to give them hands on experience of processing for manufacturing various value added products of Guava which has immense potential.

4.22.8.15.2. Support through the individual enterprise subsidy component

The PM FME scheme has the component of individual application, where the processors can be provided with the benefit of credit linked subsidy to help them in upgradation of their units. The microenterprises in the district should be encouraged to take the benefits under the individual component of the scheme through sensitization programme along with viability of Guava Processing unit. Existing microenterprises can avail support for technology upgradation. As one of the micro enterprises we met is into manufacturing of multiple products at household level and would require help for mechanization of existing processes.

Gajak manufacturing is another potential product which can be supported under the scheme. Existing microenterprises mostly manufacture gajak manually and sell it to traders in the district or to retailers in Chandigarh. While interaction with these microenterprises revealed that there is a scope of technology upgradation through mechanization and packaging equipment. These microenterprises can be supported for technology upgradation of their existing facility in the district.

4.22.8.15.3. Training and capacity building of the enterprises under the scheme

During the interaction with various stakeholders, it was found that processing of Guava is meagre. Hence, this creates a dire need to train entrepreneurs, farmers about post-harvest management, value addition of Guava. Special training programmes can be conducted in collaboration with SLTI and KVK, Patiala on Guava processing and business planning for Guava processing unit.

Training and capacity building component of the scheme can be leveraged for the training and capacity building of the enterprises. Training and capacity building can be undertaken on topics like post-harvest management, food safety and hygiene, better manufacturing practices, marketing and branding etc.

4.22.8.15.4. Marketing and branding under the scheme

During the interaction with various stakeholders, it was found some of the microenterprises are involved in pickle, Jam and Jelly manufacturing from Guava. But they require marketing support as currently some of them are selling at the fairs and exhibitions or through traders in Himachal Pradesh. If some umbrella brand is created for marketing and branding support for these existing enterprises, this will boost processing of Guava in the district.

Proposed interventions are summarized in the table below as per the requirement of the TOR;

Infrastructure	**Up-gradation proposals**
A) Public Infra	Public infrastructure in the district is good and require no improvement as per the stakeholders we have interacted with.
B) Common facilities	Incubation center at Patiala with different processing lines of Guava will help microenterprises to enhance their skills in processing. It will also provide hands on training to microenterprises through learning by doing. Here microenterprises can process their produce on service charge bases
C) Testing facilities	Patiala district has only one food testing lab cum canning facility. One common food testing facility can be proposed to ensure quality of processed products manufactured by microenterprises.

D) Safety standards	Separate modules on food safety and standards in collaboration with SLTI, DLTIs can be organized for microenterprises and SHGs/FPOs
E)Institutional support	Exposure visits in collaboration with state and national level technical institutes/ larger processing units can be arranged for microenterprises.
F)Marketing support	Marketing support for branding and marketing of products manufactured by the existing microenterprises either into ODOP or non-ODOP is required. This will create 'Patiala Guava' as brand at state and national level. This will fetch better prices to the micro-enterprises and farmers for their products.

4.22.8.16. Key impacts

Post-harvest losses in Guava reaches to the tune of 17% from farm gate to retailer if fresh fruit is sold. If proposed interventions executed, then post-harvest losses will be minimized and farmers will fetch better prices for the produce.

4.22.9. Non ODOP

Based on production trends and inclination of producers Fish and Mushroom can be next potential ODOP of the district. Currently there are no processing units in the district for Fish and Mushroom and both the commodities has ample opportunities for value addition.

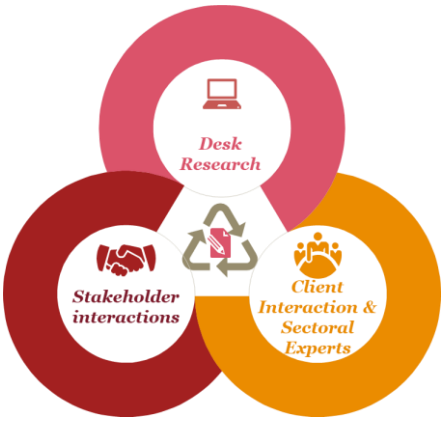
5. Approach & Methodology

5.1. Objective of the assignment

Punjab Agro Industries Corporation has engaged PwC for providing services for preparation of the State Level Upgradation Plans for the PM Formalization of Micro Enterprises Scheme. We understand that the baseline study and detailed cluster study will be helpful to generate key indicators that would be used to understand the current scenario about the Agro-processing sector, which would further aid in development of micro food enterprises in the state

5.2. Broad approach taken to conduct the study

A multi-stage logical approach was taken through a collaborative process involving all stakeholders across programme value chain to assess the need gaps for the intervention, the design of the intervention and its impact.



The following stages were involved in designing the SLUP:

i. ***Analyze:*** Critical analysis of prevailing food processing ecosystem in the districts.
ii. ***Consult:*** Collaborative consultation and brainstorming around the need of the scheme, processes thereof, impact of the scheme, success factor, challenges etc.
iii. ***Integrate & triangulate:*** Findings from various primary & secondary sources put through a logical process of integration and triangulation to build an overall refined understanding of the scheme.
iv. ***Design the SLUP:*** SLUP was designed after following steps.

The approach mentioned above has been explained in detail below;

Approach to the assignment	Components of the approach
Analyze	**Analyse existing ecosystem:** ○ **Baseline study:** Conducted a baseline study in food processing sector in Punjab. ○ **Analyses:** Analysed the existing schemes/policies/programmes of central and state governments related to food sector. We will also analyse the prevailing regulation, production, and safety standards.
Consult	A comprehensive Research framework designed for conducting primary consultation and surveys. The Primary tools would be administered to gather data around pre scheme need gaps, understanding of scheme design among beneficiaries, perceptual impact etc.
Integrate & triangulate	○ The facts and findings accrued through the above two processes integrated and triangulated around key variables to find out abnormalities and deviations. ○ Triangulation administered through observations collected through Primary Surveys, Secondary Analysis and project documents furnished by the foundation.
SLUP	Based on the studies carried out in the aforementioned steps, State Level Upgradation Plan is prepared

5.2.1. Study area

The study was conducted in the entire state of Punjab covering all 22 districts (before formation of 23rd district i.e., Malerkotla).

5.2.2. Sampling

Semi structures interview questionnaire devised for government officials and SHG/ FPO members We have consulted 50 individual micro food enterprises/SHGs/Cooperatives in each district. For individual micro enterprises structured questionnaire was developed. The sample size of micro enterprises inclusive of SHG member and FPO member is illustrated below:

Sr. No	Products (ODOP)	District	Micro-food enterprises interacted with (Individual/SHG/FPOs/co-operative)
1	Pickle & Murraba	Amritsar	50
2	Poultry meat & fish product	Barnala	50
3	Jaggery and Allied	Hosiarpur	50
		Fatehgarh Sahib	50
		Gurdaspur	50
4	Litchi	Pathankot	50
5	Potato	Jalandhar	50
		Moga	50
6	Tomato	Kapurthala	50
7	Peas	SBS Nagar	50
8	Honey	Bathinda	50
9	Milk & Milk products	Sri Mukatsar Sahab	50
		Mansa	50
		SAS Nagar	50
		Faridkot	50
10	Mango	Roopnagar	50
11	Onion	Sangrur	50
12	Kinnow	Fazillka	50
13	Chillies	Firozpur	50
14	Pear	Tarantaran	50
15	Guava	Patiala	50
16	Bakery Products	Ludhiana	50
		Total	**1100**

5.2.3. Sources of Data

The mode of collection of data was both through primary survey and through secondary resources.

Secondar data

The secondary data is collected from various sources like MoFPI, CII, APEDA, NABARD, Department of Agriculture and cooperation (GoI), Department of Animal Husbandry and Dairying (GoI) various departments of Govt. of Punjab, articles, journals, reports etc. and online sources towards agricultural produces, export and processing.

5.2.4. Interaction with stakeholders

We have interacted with multiple stakeholders like scientists from KVK, Officials of NABARD, GM, DICs, Horticulture Development Officers, Agriculture Development officers, Officials from SRLM, representatives from Industry association, Input suppliers to get an insight of current scenario, challenges and opportunities for the ODOP processing.

6. ODOP

PM FME Scheme adopts One District One Product (ODOP) approach to reap the benefit of scale in terms of procurement of inputs, availing common services and marketing of products. ODOP for the scheme will provide the framework for value chain development and alignment of support infrastructure. There may be more than one cluster of ODOP product in one district. There may be cluster of ODOP product consisting of more than one adjacent district in a State. The ODOP product could be a perishable agri produce, cereal based product or a food product widely produced in a district and their allied sectors.

With respect to support to existing individual micro units for capital investment, preference would be given to those producing ODOP products. However, existing units producing other products would also be supported. In case of capital investment by groups, predominately those involved in ODOP products would be supported. Support for common infrastructure and marketing & branding would only be for
ODOP products.

The government has conducted a baseline study to identify ODOP for all 22 districts. The ODOP identified are the food product for a district, keeping in perspective the focus of the scheme on perishables, products processability, scalability etc. The identified ODOP includes fruits, vegetables, meat/poultry, honey and products like Murabba, pickle and bakery. List of ODOP identified are depicted in the map and table given below;

Figure 20: Map showcasing identified ODOP

Table 31: Identified ODOP for 22 districts

Sr. No	Products (ODOP)	District
1	Pickle & Murraba	Amritsar
2	Poultry meat & fish product	Barnala
3	Jaggery and Allied	Hosiarpur Fatehgarh Sahib Gurdaspur
4	Litchi	Pathankot
5	Potato	Jalandhar Moga
6	Tomato	Kapurthala
7	Peas	SBS Nagar
8	Honey	Bathinda
9	Milk & Milk products	Sri Mukatsar Sahab Mansa SAS Nagar Faridkot
10	Mango	Roopnagar
11	Onion	Sangrur
12	Kinnow	Fazillka
13	Chillies	Firozpur
14	Pear	Tarantaran
15	Guava	Patiala
16	Bakery Products	Ludhiana

Detail about each ODOP is given in subsequent sections

7. Profiling of identified groups

7.1. Overview of existing ecosystem for groups in Punjab

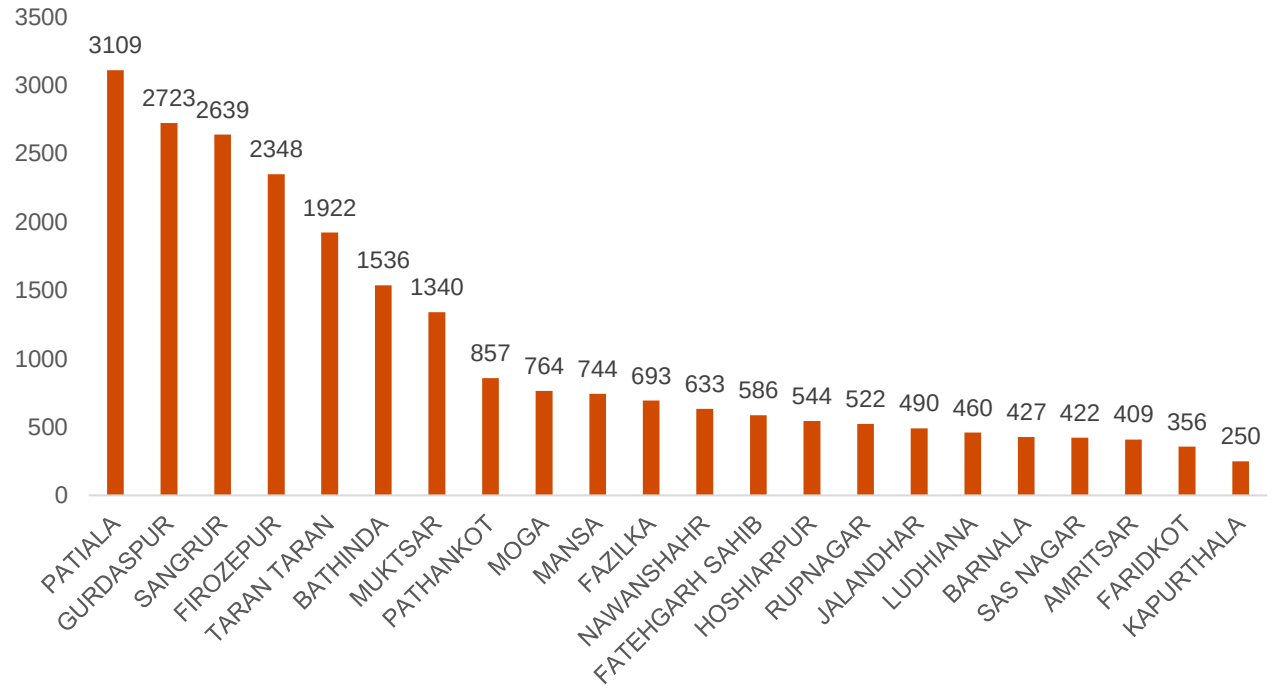
7.1.1. Self-help groups

In Punjab, Government organization, NGOs and banks have facilitated the creation of SHGs and majority of SHGs are promoted by Government Organizations. Though Punjab is not one of the leading States in the SHG movement, of late, the State has picked up the momentum in formation and credit linkage of SHGs. As on 31st March 2019, cumulatively 44637 SHGs have been saving linked and 31495 SHGs have been credit linked in the State[84]. Average loan per SHG in the state of Punjab is INR 0.50 lakhs which is less than national average of INR 2.16 lakhs.

There are 23,774 Self Help Groups formed with the support of State Rural Livelihood Mission. It is evident from the graph that Patiala, Gurdaspur, Sangrur, Ferozpur and Taran Taran, Bhatinda and Muktsar has more than 66% of the total number of SHGs in the state.

Most of the SHGs in the state have 16-20 members in their SHGs. NGO promoted SHGs had more number members in SHGs than bank or government promoted SHGs. Most of the SHGs in the state were formed with a motive to get government subsidy or avail loan. Most of the SHGs have been supported under Swarnajayanti Gram Swarojgar Yojana.

As per primary interaction with the SHGs it was observed that most of SHGs conducted regular monthly meeting to collect savings and provide loan to members. SHGs involved in enterprise activity meet regularly to perform activities related to the enterprises.



Graph 183: :District wise SHGs supported by SRLM in the state

Source: NRLM, Ministry of Rural Development

[84] State Focus Paper-Punjab 2020-21, NABARD

As per State Focus Paper published by NABARD state ha credit potential of INR 3280.18 crores to the fund SHGs/JLGs/ODs.

About 300 SHGs across the state are involved in food processing activities across the state. Most the SHGs are involved in Pickle, Murabba, Wadiya, Papad and Spices processing activities. In districts like Bhatinda dairy based SHGs are also prevalent. Procurement of the raw material is done from the nearby mandis. Manufacturing process takes place at one of the SHG members house. Activities undertaken by the SHGs are manual and the products are packed in polythene or plastic jar without branding. SHG members during interaction informed that they mainly sell their products in fair/exhibitions at national/ state level. These melas are organized by DRDAs, at district and block levels. They also put up their stalls in weekly haats in the near by cities. SHGs receive training from SRLM and Krishi Vigyan Kendra in the district.

Interventions required

i. **Capacity building:** SHG members informed that they require capacity building for post-harvest management of the produce and Good Management Practices.

ii. **Marketing, packaging and branding:** Apart from capacity building support in terms of marketing, packaging, branding, technology upgradation and common infrastructure for processing and storage is required.

iii. **Common infrastructure:** SHGs has suggested to provide common infrastructure in the close vicinity. This common infrastructure may be equipped with plant & machineries for processing activities. The common infrastructure should also have storage space for finished products and raw material.

Figure 21: Pickles packaging and participation in weekly haats

7.1.2. Farmers producer companies

In Punjab, there are 103 FPOs (as on 31 Dec 2019) covering 7,235 farmers promoted by NABARD working in various sectors. Out of these, 67 FPOs have been promoted under the PRODUCE fund and 19 FPOs under NABARD's promotional fund (FSPF) and 17 under a specifically earmarked NABARD fund for Producer Organizations (PODF) covering a gamut of activities like agro processing, dairy, goatery, vegetable cultivation, etc[85]. District of Gurdaspur and Hoshiarpur has a greater number of FPOs in comparison to other districts in the state. District wise list of FPOs is annexed.

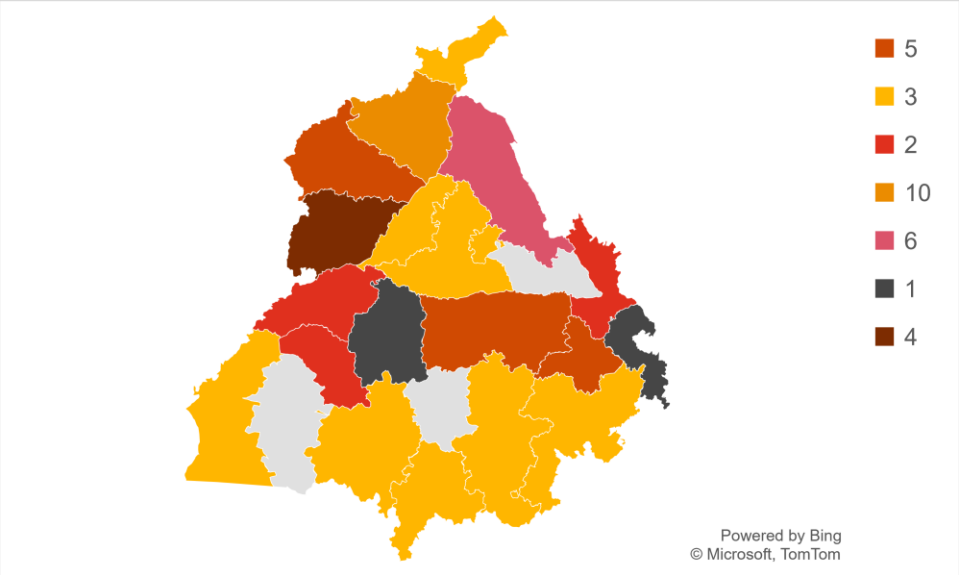


Figure 22: Map showing district wise no. of FPOs promoted by NABARD under PRODUCE fund

Although these FPOs are still in nascent stage but it has brought visible change in collectivizing the operations of farming of small and marginal farmers. Through FPOs the access to agri-inputs, extension services, market, etc. have become easy and economy of scale is being reflected in their operations. Less than 1% of the existing FPOs is involved in food processing activities.

SFAC has supported 7 FPOs covering 6288 farmers in the state of Punjab.

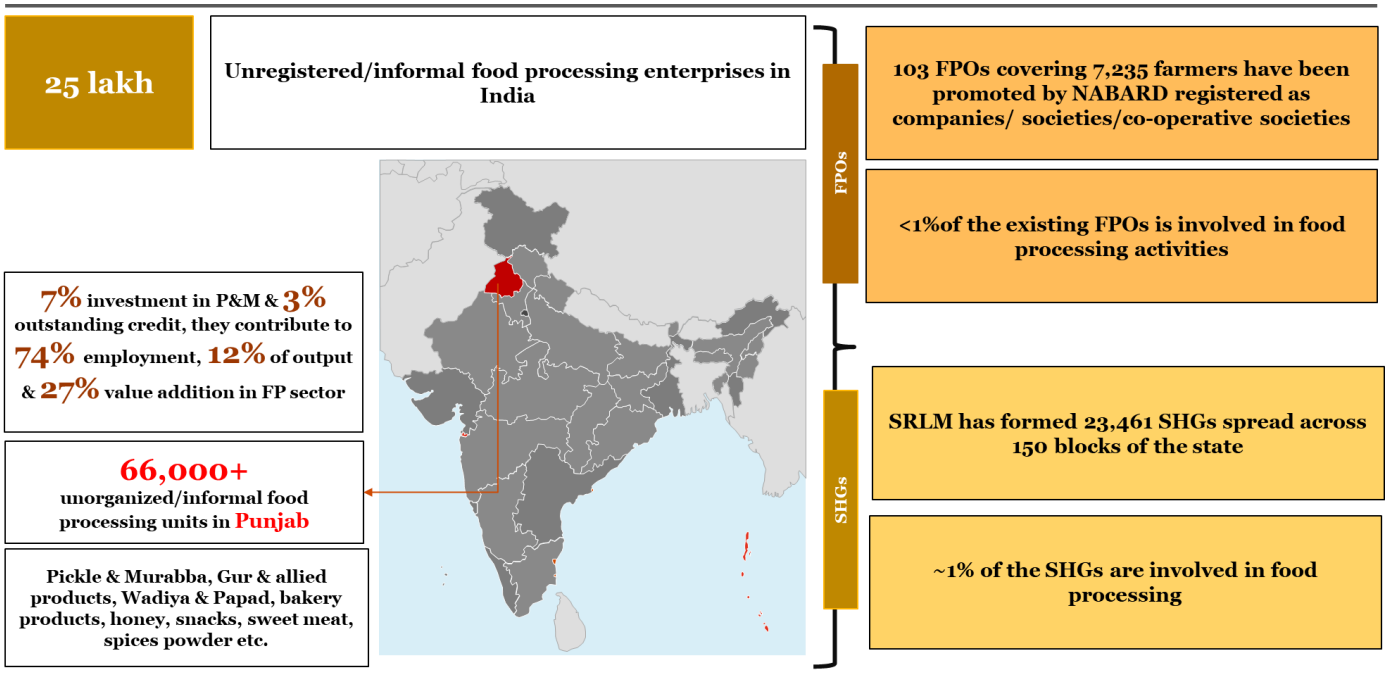


Figure 23: Overview of the unorganized sector in food processing

[85] State Focus Paper- Punjab 2020-21

8. Benchmarking – Case Studies / Success stories

Unati Cooperative Marketing cum Processing Society Ltd, Talwara

About the cooperative

The Unati Cooperative Marketing-cum-Processing Society Ltd. (hereafter referred as Unati or the Unit or cooperative) is a Cooperative Society registered under Punjab State Cooperative Act. 1963. It is managed by 14 core members with expertise in 'Biotechnology, Agronomy, Plant Pathology, Soil Sciences, Ayurveda, and Pharmaceuticals' and 311nominal (non-shareholding) farmers/collectors. The unit came into existence in 2003. The project was funded by the Department of Bio-Technology, Government of India through Punjab State Council for Science and Technology, Chandigarh under which a facility for processing of 'Amla' with backward integration so as to benefit the local people, was established. During 2004-07, the Department of Bio-Technology through Punjab State Council for Science and Technology, Chandigarh supported unati in establishment of the processing unit which was handed over to the cooperative in 2007. Since then the unit had been progressing by leaps and bounds and was 100 per cent self-financing one, without any direct government financial aid, subsidy and bank loan. Unati is one of the most successfully run self-sustainable co-operative with livelihood generation at its core.

Procurement of Raw material

Unati collects and cultivates raw material through backward integrated cooperative structure through 400+ community members of Unati. Produce is collected by farmers at village level and transported to the processing facility. Member farmers receive pre agreed basic price of the produce and share in the profit/bonuses. There is ample raw material available in the cluster.

Products manufactured

Unati is involved in manufacturing of various value-added products like Amla valued added products (juice, candies, chutney, honey dipped amla, powder, pickle, murabba etc.), Fruit based burfies (Amla, Apple, Bael, Guava, Mango, Pineapple), value added jaggery products, fruit-based vinegar, vegetables, fruits and medicinal plant-based juices.

Marketing channels

Unati already has a well-established distribution network and it is expected to play a prominent role in the sale of the selected products. They are associated with 3 super stockists, 14 distributors, 1100 retailers across Punjab, Haryana, Himachal Pradesh and Delhi NCR for marketing of the produce. Unati already has tie up with D- Mart for sale of aasnaa products. D-Mart is a well-established supermarket chain present in 221 locations across Maharashtra, Gujarat, Andhra Pradesh, Karnataka, Telangana, Chhattisgarh, Delhi NCR, Tamil Nadu, Punjab and Rajasthan.

All products manufactured or marketed by Unati are certified organic products. Different certification has been obtained from APEDA, India Organic, Halal India, USDA Organic, Oner cert, FSSC 22000. The cooperative is market linked with big brands as Apollo Pharmacy, Medplus Pharmacy, Healthkart.com, Godrej Natures Basket, and many more. It is also involved in job work like manufacturing of various products for the big brands like Dabur, Patanjali, Apollo Pharmacy which are then marketed under these brand name. Unati also exported their product to Europe, USA, Canada and Dubai. The unit sold its products directly also, through the cooperatives in Hoshiarpur, Gurdaspur and a few other places in Punjab. It is first in India to have organic certified apple cider and jamun vinegar. Its turnover for the FY 21-22 is expected to reach the figure of Rs 40 cr.

Facilities available

- It has state of art infrastructure for value addition spread over 5-acre in Talwara, Distt. Hoshiarpur, Punjab Participation of 990+ members
- It has team of professional technocrats
- It has Inhouse quality and R&D labs
- It has member of state level food processing industry association

Workforce

Unati has more than 200 employees (mostly local women) which generates livelihood for thousands of people. Most of the work force is local except some technical positions like food technologist etc. Over years Unati have successfully restored natural bio-reserves in 80,000 acres of organic certified area of lower Shivalik hills.

The Unati Cooperative is a true example of women leadership and empowerment, various operations of which being run by local women. The company has more than 400 members and a core handling team. The organization is being managed by Mrs. Rajni Sharma (President), Mr. Swami Kamal (Vice-President), Mr. Jyoti Saroop (General Manager) and Mr. Sunil Dutt Dogra (G.M Marketing).

Key strategies implemented

The highly skilled team expert in biotechnology, food sciences, sociology, agronomy, soil sciences by their hard work created the best fusion of modern technological process in the processing of the Unati's product with high nutritional index. The Unati's goals to provide the best products and focus on the sustainable utilization of agriculture and natural bio resources of the lower Himalaya for the empowerment of the rural communities. The following are the key strategies adopted/followed by the unit to become successful.

1. Value addition and better market linkage:
   Association with the unit benefitted the farmers by way of their market linkages and value addition in the product for better price realization. The collected products are processed and sell in the distant market or have proper market linkages. Which yield in increase in income at the farmer level.
2. Focus more on naturally existing bioresources than the cultivated ones.
3. Skill development and create local resources.
4. Excellent extension, training and procurement facilities.
5. Disseminated new production/practices technologies like lemon crops, bitter gourd which have medicinal importance, and which results in getting good market price than the convention crop of Rice and wheat.
6. Focus on cultivating organic products.
7. It has also promoted community and social development programmes like Unati Slum and Landless Income Generation Programme, Unati Skill India Programme, Unati Swachh School Abhiyan in the area.

Impact

The unit that had a humble start in 2001 grew by 2007 into a successful business enterprise. It received one time financial assistance from the government for setting up of the processing activities, well supported by wide market linkages. Besides, a paradigm shift towards cultivation of the input crops resulted in higher returns due to assured purchase by the unit.

Unati has transformed from a small rural development project into a successful business enterprise with turnover of Rs. 15.00 crore in 2016-17, generating income of more than Rs. 3.00 crore to local Community. The Unati model is designed on the basis of self- sustainable where the revenue generated supports the social component of the program. The unit moto is to serve organic to the peoples along with the upliftment of people in all sense. Their team consist a greater number of women workers in-comparison to male to increase women empowerment.

Sahyadri Farmer Producer Company Ltd. (SFPCL)

About the SFPCL

Sahyadri Farmers Producer Co. Ltd. (SFPCL) started as a private enterprise of grape exporters and has established itself as an FPC in grapes and also a variety of horticulture crops. SFPCL is operating in Nasik district of Maharashtra which has excelled in a short span of time. It has leveraged its presence in the total value chain by involving itself in all the activities of the supply chain including processing and export. The primary objective of the company was to provide the best of infrastructure and adequate production and processing facilities to the farmers to make them participate in the value chain. By providing continual extension services through its use of ICT, SFPCL has ensured standard inputs to farmers. It lays emphasis on export markets, particularly in Europe. SFPCL ensures that customers can track their products from the farm plot to the destination. This emphasis on the quality and traceability has ensured that SFPCL products are preferred and FPO member-farmers earn more than non-members. The company is working with a tagline “of the farmers, by the farmers, for the farmers”. Sahyadri was a movement started by Shri. Vilas Shinde, Chairman of the company, with focus on the welfare of the farmers to get them their righteous due, while doing business profitably.

The company is working with about 8000 farmers including 11 farmer producer organizations with a capital base of ₹ 52 crore and employed 250 staffs. Majority of the farmers working with this company are small and marginal farmers. The members of the company are involved in cultivation of high value crops like vegetables and fruits. Majority of the members are cultivating grapes by using the technology of Global GAP with the technical backstop of the company. Even in other crops the focus of the company is to produce safe and hygienic food.

Key strategies implemented

The company planned to have branded traceable product mix that would promote sustained growth and ensure the supply of the best quality produce to the consumers at reasonable prices. The idea behind the enterprise was to buy all the Fruits & Vegetables offered by the farmers in strict compliance with food safety standards. The challenges before the company was to provide the best of infrastructure, adequate production and processing facilities to the farmers, who had very low level of awareness about Good Agriculture Practices (GAP). The key strategies planned at every stage from production to processing to marketing, by the company to become successful is as follows:

1. **Production:** Production includes scientific cultivation of specific fruits and vegetable which is having enormous demand, both in the national and international market.

2. **Processing:** The safety standards are taken into consideration for processing of the fruits and vegetables. Aseptic fruit processing is followed for products by sterilizing and is packed in drums/containers to maintain the sterility, which allows the products to maintain a longer shelf life without any preservatives till the opening of the aseptic bags. The products covered by this process include tomato, mango, guava and papaya pulp. With the all latest technologies in processing. Latest technologies are used for processing of fruits and vegetables like plate freezers for freezing fruit pulps/purees like Mango, Guava, Papaya etc., Individual Quick Frozen (IQF) for increasing the shelf life for e.g. Mango dices, papaya dices, pineapple dices, Sapota dices, onion dices, sweet corn, cut bitter gourd etc.

3. **Marketing:** SFPCL adopts a wide-ranging marketing strategy covering both domestic as well international markets. Such strategy helps the company in ensuring that farmers should get remunerative price for their produce. Over a period of time, the company has created its own brand due to its approach for providing

clean and hygienic products. The company has made its presence felt in the International market also by fulfilling safety and quality norms as per the international standards.

4. **Diversification:** The company has been exporting grapes in the beginning and the export is a very short duration business for 2-3 months. Thus, the grading, storing and packing facility established by SGPCL is effectively used for grapes only for 3-4 months. Hence SGPL decided to expand through diversification to new crops, new facilities and new farmer members. The company has now expanded its operations to vegetables growers, and it has reached to about 10000 farmers across the state. The company has also purchased a wasteland plot to set up a modern integrated facility for the grading, processing and packaging of fruits and vegetables near the Nasik cargo airport. A large agricultural mall is also being added to the processing facility. This large sized facility has a Handling Capacity for Fruits and Vegetables of Fresh: 350 MT/day; Processed: 250 MT/day. It also has a large cold storage capacity of 2000MT that can produce equal weight of frozen products through the IQF method. It has a testing and certification laboratory. The facility has 6 pre cooling rooms to handle 50MT each of fresh fruits, a Vacuum Pre Cooling for leafy vegetables, 8 advanced and fully controlled ripening chambers of 25MT cap each, 8 semi controlled ripening chambers for mango of 250 MT each capacity, IQF facility of 50MT capacity per day and Plate Freezer Facility of 40MT per day capacity. The company is regularly doing research and development on enhancing self-life of perishable vegetables and different ways of processing.

5. **Linkages:** The company carries out both backward and forward linkages. As a part of backward linkage, the company provides services such as scientific cultivation or production of crops with the help of extension functionaries of the company. As a part of forward linkages, The company has developed a chain of retail outlets by establishing stores under different models like, own, franchisee, dealers/distributors. the company has developed a good network of domestic retail chain operators for selling produce of its members, mainly vegetables.

6. **Capacity building of the farmers:** Farmers get requisite training through the extension workers of the company at different stages of crop production. The capacity building and extension programmes of the company has helped the farmers in adopting the requisite technologies. The company also thought about the wellbeing of the farmers. Thus, technologies and new practices are introduced in such a manner that the same are compatible with the local environment and culture for their smooth adoption and sustainability.

Profit sharing mode

It is sharing its profits earned through processing and exports amongst its members. Due to collective approach, the company is able to reduce the transaction costs to a considerable extent, the benefit of which are percolating down to the farmer members

Impact

The bulk of income of the company comes from export of grapes to countries like USA, Europe and West Asian Countries. The company has registered an overall growth of more than 38%, since inception till 2017 in grapes export. Thus, the Grape export stands a major contributor to the company's revenue. The company is also involved in processing activities covering a wide range of products such as fruit juice, ketchup, jam and jelly. The company has got tie-up with major retail players for marketing of fresh vegetables. In a span of six years, the company's capital base has increased from just ₹2 crore in the year 2011-12 to ₹52 crore in the year 2016-17.

The company put more emphasis on scientific cultivation with quality production of crops to meet all the food & safety standards. This helps in increasing their exports. For maintaining the quality in production & processing, certification plays a major role. Thus, presently SFPCL has got certified by:
1. Lloyd's Register Quality Assurance: Food Safety Management System Standards ISO 22000:2005
2. Food Safety Standard Authority of India (FSSAI) for processing

3. Global G.A.P. - Certificate of Conformity by British Retail Consortium Certification Body.
4. U.S Food and Drug Administration, Federal Food, Drugs and Cosmetics Act.
5. Kosher Certification- Rabbi Don Yoel Levy, Kashruth Administrator, New York, U.S.A.
6. Halal Jamiat Ulama E- Maharashtra

The Sahyadri Farmer Producer Company has established itself in less than a decade time and has become a leading exporter of grapes from India. It has emerged as a successful model for management and operation of a Farmers producer company in Indian agricultural environment. Furthermore, the culture of an FPC should necessarily be farmer-friendly for its long term success.

Jata Sattu – Chickpea Processing by FPC, which support women entrepreneur in generating livelihood at their doorstep

Background:

PwC is implementing DFID funded project named Bihar Agricultural Growth and Reform Initiative (BAGRI). As part of it, PwC has promoted 20 Farmer Producer Companies which are registered under Companies Act, 2013. Main objective of these companies is to increase farm income through demand and produce aggregation to capture more value for farmers.

More than 90% farmers in Bihar is small and marginal farmers. As a result, they have very low marketable surplus in absolute volume per farmers. Small land holding size restricts farmers to reap benefits of economies of scale causing the price realization from agri-produce to decrease as they sell their produce largely to the middlemen who procures from doorsteps of farmers. There are chains of aggregators before the final produce reaches to institutional customers. Usually there are three level of intermediation i.e. Village Level Aggregator, Cluster Level Aggregators and District Level Aggregator. It decreases the price realization for the farmers considerably. There is need to promote value addition at village level to capture more value which could be passed on to farmers thereby leading to increment in farm income. Bihar produces about 67K MT of Gram/chickpea. And the farmers are not getting better pie of consumers money because of lack of processing and value addition at farmers level. Small and marginal farmers face following challenges in existing chickpea value chain.

- Malicious Practices of Traders
- Information Asymmetry
- Low Awareness about Value Created through Primary Processing
- Lack of grading and sorting

Additionally, small and marginal farmers being dis aggregated had very small per farmers marketable/processable surplus thereby not able to get better price realization. Therefore, Dumraon Farmer Producer Company Ltd is developed the product and manufacturing capabilities with the FPC for manufacturing of **Jata Sattu.** FPC markets the produce in Patna and Buxar's market. FPC has also facilitated tied up with e-commerce platform Milk Basket which is based out of NCR to market the product.

Key Strategy & Impact

To maintain the nutrient content of Sattu, it is prepared/processed through traditional stone grinders as temperature of the Sattu during machine grinding raises to the point that nutrients starts to breakdown. consumers are getting healthier product with better texture, flavor and

aroma with better nutritional Value. Such center is named as Jata centre and the produce is called as Jata Sattu. One Jata Centre could augment livelihood for 20 women. Women earns Rs 25/kg of grams that is provided to them to grind and it provides women with potential to earn Rs 200 per day per women. Whereas FPC markets the produce in Patna and Buxar's market. A technical team has also facilitated linkage of the product with Milk Basket which is leading e-commerce based out of NCR.

The CROPP Cooperative: The Coulee Region Organic Produce Pool (or Organic Valley)

Introduction

CROPP started in 1988 by seven farmers, who were fed up with the state of American agriculture and family farms that were going extinct. Idea behind the foundation that food could be raised in the right way, and farmers should be treated fairly[86].

The CROPP Cooperative is the largest organic farmer cooperatives in North America, one of two national buyers of organic milk, and one of two national organic dairy manufacturers in North America. The cooperative's official name is Coulee Region Organic Produce Pool[87], and it is organized as a new generation cooperative, owned and controlled by patron-members who also transact with the business. CROPP has a unique policy of sustainable and stable producer pay-pricing for organic milk in the emerging organic dairy industry. The story of CROPPS will help in understanding the economic role that organic dairy operation might play for small and medium-size dairy farmers as they attempt to maintain an economically sustainable family farm lifestyle[88].

Journey of CROPP

CROPP cooperative presently (August' 2021) has 1,800 family farms and 955 employees, all pooling their passion and resources to bring organic food to the tables of consumer[89]**.** The farmers share the costs of getting their products to market, and they share the profits when the company does well. CROPPS shares vision of a healthier, more sustainable food system. [90]

The major reason for success of CROPP cooperative is commitment of member farmers towards quality of produce. Members are committed towards[5]: -

1. Cooperatively marketing of the finest in certified organic products produced exclusively by farmers members.
2. Marketing the nutritious, wholesome food as directly as possible to the consumer.
3. Establishing farmer-determined prices which provide the farmer with enough profit to sustain his family and his farm.
4. Encouraging a farming future that emphasizes ecological diversity and economic sustainability.
5. Enabling a healthy human livelihood by providing quality employment, cooperation, organic education, and community growth.
6. Practicing environmental awareness and cooperative principles in all aspects of production, handling, marketing, and operations.
7. Promoting a respect for the dignity and interdependence of human, animal, plant, soil, and global life.

Key challenges faced

Like most other successful businesses, CROPP's startup was filled with obstacles. The Cooperative was initially formed to market organic vegetable products. They soon shifted to dairy, in part because they realized that a year-round-market for organic dairy products would be more stable than seasonal vegetable markets. Furthermore, they decided to focus on cheese products, which have a longer shelf life than fluid milk and therefore required less intense management and staff. Getting into the organic dairy market, however, was difficult. In 1988 there were no standards available for certifying milk as organic. At that time, the Organic Crop Improvement Association (OCIA) concentrated on fruits and vegetables. Consequently, dairy farmers had to form their own organic standards on feeding and herd health practices and submit them to the national OCIA for critique.[5]

CROPP also faced regulatory obstacles. Wisconsin laws prohibit a group of farmers from shipping their milk together without appropriate licensing. Several of the original farmers were members of the NFO (National

[86] https://www.organicvalley.coop/about-us/organic-food-co-op/
[87] http://www.unitedbuyingclubs.com/PRODUCTS/v_OrgValley_Jun04.htm
[88] Price Stability and Economic Sustainability–Achievable Goals? A Case Study of Organic Valley®, https://www.jstor.org/stable/24476506
[89] https://www.organicvalley.coop/about-us/organic-food-co-op/
[90] https://resources.uwcc.wisc.edu/CaseStudies/Cropp_CaseStudy.pdf

Farmers Organization), which offered to handle the required licensing, write milk checks, and test milk as long as CROPP dairy members joined the NFO. The NFO also helped finance the co-op's initial cheese inventory with a substantial loan offered under exceptionally good terms.[5]

Marketing: - One of CROPP's biggest marketing challenges early on was consumer education. During the co-op's first few years, there wasn't any money in the budget for consumer education about organics. General public awareness of the meaning and purported benefits of organic food was still quite low, and consumers balked at the high prices of CROPP's organic dairy products—which were the only ones on the shelf in most stores[5].

Participation of farmer: - Increasing size of the organization would affect farmer participation and their voice in organizational and marketing decisions. Moreover, to handle marketing and sales, CROPP's administrative staff has grown to about 200—about one-half the number of farmer members. Most of these employees are not farmers and have been trained in conventional marketing. A few farmers expressed concern that these employees might not be committed to the co-op's central mission.

Success story

CROPP launched brand "Organic Valley". In 1990, CROPP introduced the USA's 1st organic butter, and in 1992, they became the organic milk supplier for America's 1st nationally distributed organic yogurt brand. Between 1995 and 2000, they launched several more "firsts" in the organic industry, including Parmesan cheese, cottage cheese, string cheese, "high heat processed" fluid milk, as well as a lactose-free milk. They also built up a sizable business in organic egg sales. And in 1999 CROPP launched a second brand, "Valley Family of Farms", to market certified organic beef, pork, turkey, and chicken[5].

Approximately ninety percent of CROPP sales are dairy products, 9 percent are eggs, and 1 percent is meat. The co-op decided to market other products like orange juice, mainly because in many stores these products are sold in refrigerated cases alongside dairy products and having a wider space on the shelf gives them more exposure to the customer[5].

As of year, 2019, CROPP achieved revenue of $1.146 Billion, operating income of $28.724 Million and total asset of $356.726 Million.[91]

Impact on Co-op members

Members benefit financially in three ways.

First and foremost, they receive significant premiums for their organic milk. CROPP has essentially made a decision to transfer its profitability back to its members on an on-going basis, by distributing premiums in the milk checks every two weeks. Not only is this a variation of the more traditional co-ops, which often retain 70-80% of profits each year in order to build equity, but it's a variation from the new generation co-ops too, which typically pay market rates for farmers product upon delivery and wait until the end of the year to distribute profits back in the form of a "value added check". CROPP members insisted that they receive larger milk checks up front. CROPP's "pay prices" are probably the number one reason most dairy farmers joined the coop. Essentially the dairy members collectively set the pay price based on their costs of production. As a result, throughout the 1990's and up to present, CROPP farmers received milk checks that hovered substantially above conventional prices. In 2000, for example, the CROPPs' price was $17.18, which, they reported, was $6.61 over the conventional price of $10.57[5].

The second way that members benefit involves a CROPP policy of paying their members 8% interest on their equity investment. This is quite unusual in the co-op sector.

Third way, members also benefit financial from a relatively fast return of their retained (non-direct) equity investment. (Their direct equity investment is not returned until they retire.) The state CROPP policy is to return members' retained equity on a seven-year cycle. This would be a fairly quick turnaround compared to many traditional co-ops, which may take fifteen to twenty-five years to revolve back equity.

Factor for success (Strategy)

1. **Creating a marketing company:** - CROPP entered the market at a good time. During the early-to-mid 1990s, the organic market really took off, and other companies began offering organic dairy products. At that

[91] https://p.widencdn.net/hf9at8/19-55006-AnnualReport_2018_FINAL

stage, there was plenty of room for competitors, and the new entrants to the market helped CROPP. “When consumers saw that others were charging prices similar to CROPP, they realized that the co-op wasn’t charging them unfairly.” In addition, increasing public concern about Bovine Growth Hormone (BGH) around 1994 helped organic dairy sales tremendously[5].

2. **Asset light operation: -** One of the keys to CROPP’s success is that they never invested much money in “bricks and mortar”. Instead, they “copack” with 45 different dairy processors around the country[5].

3. **Creative Financing**: - “Creative financing” was another key to CROPP’s early success. For instance, they needed a building to house their new operation, and found one in La Farge that cost only $25,000. However, the cash-strapped founders lacked the money for even that modest investment. So, they worked out a deal with the building’s owner to liquidate an old vat in the basement of the property, and they used the income from that sale to cover their down payment.

4. **Contribution of Member: -** During year 1991 CROPP faced financing issues, but the co-op ran a successful equity drive—members agreed to provide $11 of equity for each 100 pounds of average month milk production. This helped them in coming out from financial crisis and members ownership also increased.

5. **Participation of members in decision making: -** CROPP members are owners of the organization. Most importantly, even as the company grew from “seven farmers sitting around a table” to a large organization, it built in ways to make sure that members could participate in the decisions of the organization if they wanted to. Farmers still have a lot of say in determining pay prices, marketing strategies, and other organizational decisions. The Board of Directors is active, and farmer controlled. All the produce categories are grouped into producer pools, and each pool meets monthly to make decisions. Each region elects a representative to make sure that concerns of farmers in that region are heard by the CROPP management team.

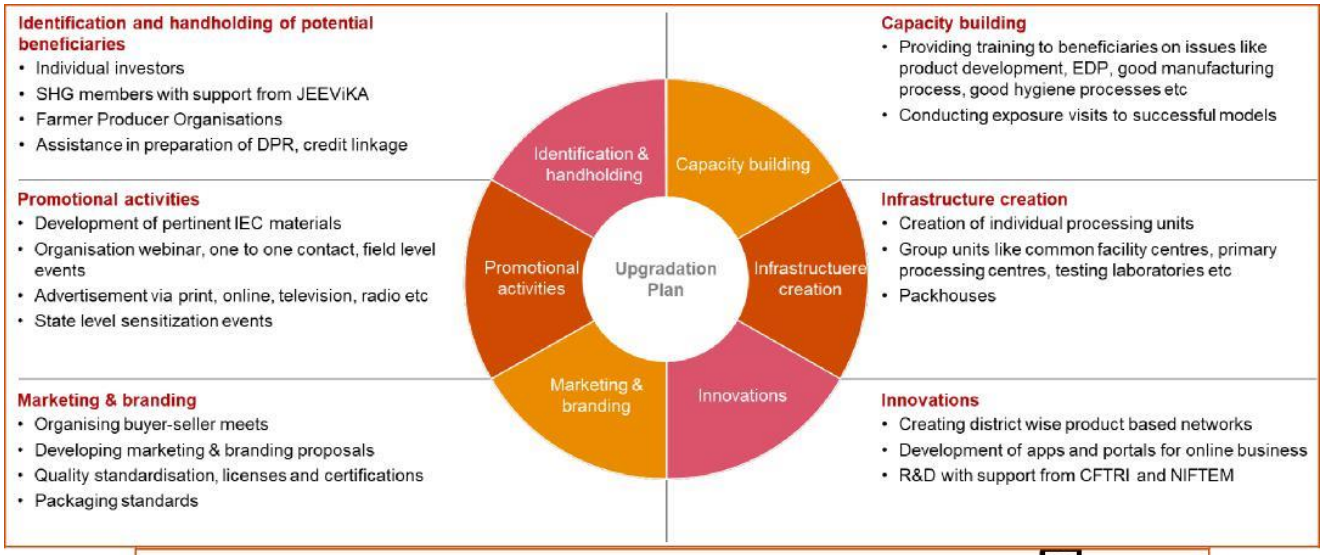
Way forward

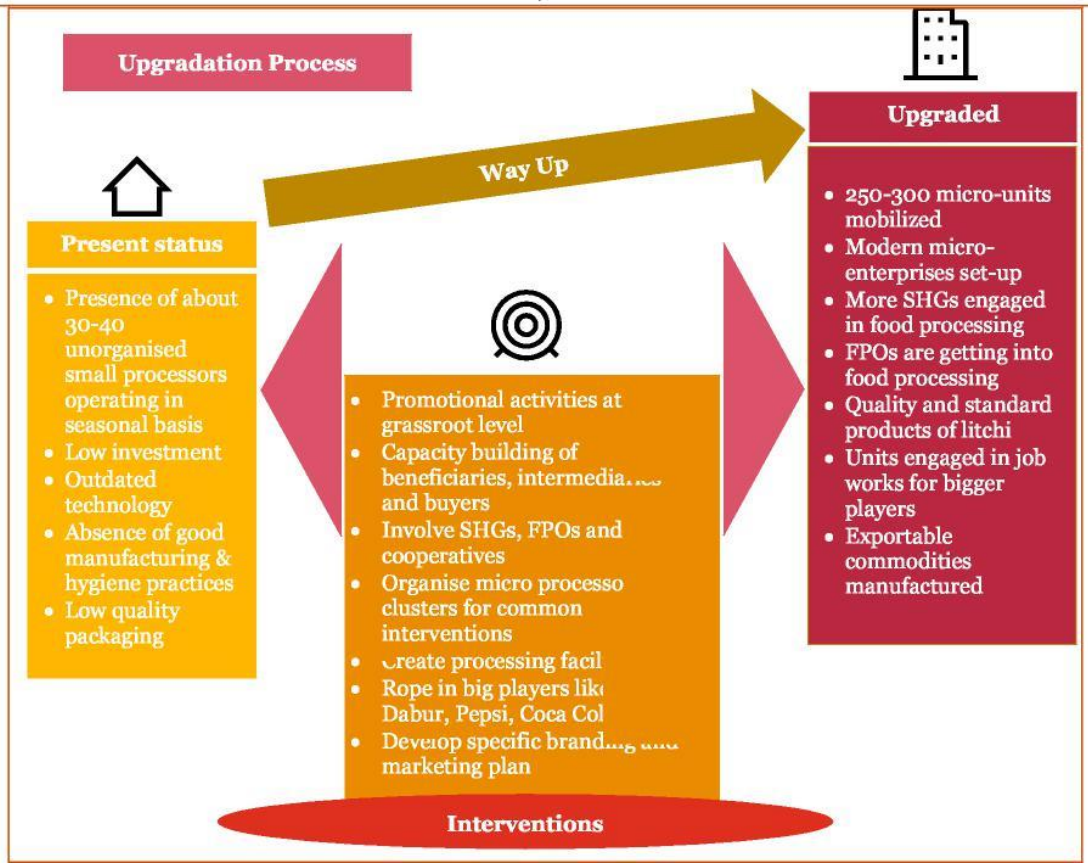
The members of CROPP are facing a critical juncture in the evolution of their cooperative. Together, they have been part of something very successful, watching their sales grow to phenomenal heights over the past years. Where they go from will depend a lot on the growth of organic markets and the actions of their competitors. They will work to identify where they will fit best within that marketplace and maintain a sufficient level of capitalization to compete there. They are on the path to achieve goals while staying true to the mission and the principles that got them where they are today[5].

9. Recommendations

Common strategy to be adopted

The common strategy that will be adopted across the State for effective implementation of the PMFME Scheme is shown below:





Firm level common issues

Firm level gaps and recommendations

Sectors	Gaps	Recommendations
Technology	• Modern manufacturing process • Packhouse • Packaging facilities	• Awareness generation among potential farmers and investors • Providing benefits of ongoing government scheme • Convergence with R&D institutions
Skill training	• Entrepreneurship development • Product development • Processing methods • Soft skills	• Organizing trainings • Linking them with ongoing trainings under government schemes • Convergence with academic institutions
Access to finance	• Lack of collateral required • Unaware about requisite documentation • Banking negotiations • Time taken in loan approvals	• Sensitization of banks by participation in SLBC meetings, DLBC meetings & in person meeting with bank officials • Handholding support • Training • Support for DPR preparation and application process
Licenses & certifications	• Unaware about various licenses and statutory clearances • Unaware application process • Time taken in obtaining licenses	• Providing training on licenses, certifications, and statutory clearances • Sensitization of government officials

In order to address the firm level gaps, strategic approach would be required, wherein:

- **Technology:** Beneficiaries would be assisted in availing latest and standard technology for manufacturing of food products. This could be done through training & capacity building of the promoters about sub sectors through technical institutions like SLTIs, NIFTEM and IIFPT. Facilitating firms in technology scouting and obtaining commercially available technologies to the interested promoters/entrepreneurs. Standard packaging facilities would be promoted for better competitiveness of the products of micro entrepreneurs. Handholding support would be extended for creating knowledge on good manufacturing processes.
- **Skill training:** It is an important aspect for sustainable development of food processing sector especially in unorganized sector. Learning and access to latest skills would help the entrepreneurs in effective use of latest technology for production processes, day to day activities required in the manufacturing units. As part of the scheme skill training need would be assessed so that appropriate training could be planned and imparted for overall development of micro food processing enterprises.
- **Access to Finance:** Sensitizing banks is key in success of the scheme, regular communication towards loan sanctioning would be facilitated. District level meetings with District Level Committees of banks shall be done to appraise them about the pendency of the project for loan sanction and providing solutions for meeting the requirements sought by banks in sanctioning of a project

- **Licenses & certifications:** Competing with bigger players is very important, all the scheme beneficiaries would be given appropriate training on licensing and certifications so that application for required licenses could easily be filled without errors. Beneficiaries would also be sensitized on the need certifications and licenses for sustenance and longevity of any enterprise in the market. SNA can write to concerned departments at state level to support micro food enterprises in obtaining the licenses by giving brief about the scheme and its objectives.

Institutional Support

The processing units operating in the unorganized sector requires a handholding support to reach to the next level. It is very important to identify and handhold units for project formulation and assisting in them filing applications. This would require awareness generation and routine unit wise follow-up. They should be given complete information about the ongoing schemes related to food processing, post-harvest management, capacity building, export promotion and financial linkage etc.

Every year categorization of units at different level needs to be done and project implementation plan for awareness generation, application assistance and financial assistance

Capacity Building

Skill gap analysis would be required in order to build capacity of the existing and potential processors, farmers, SHGs, FPOs and Cooperatives. District level skill gap analysis would help in devising training programmes and developing training modules in consultation with State Level Technical Institution, NIFTEM and IIFPT. Few of the identified skill gap that need to be addressed are:

a) **Product development:** It is very important to make the potential investors aware about the types of processing that can be done from Litchi. Potential investors may be given training on the processing methods and the technology that would be required for better product development, increasing shelf life and value addition. This would help the processors in getting better realization and compete in the market. Likewise training on innovative product development based on demand for ODOPs like achar & murabba, bakery etc. Trainings on increasing the efficiency of the units through technological interventions can be conducted. For example, use of dehumidifier to reduce moisture in honey.

b) **Standard manufacturing processes:** Processors would be given training on latest technology available and quality of material of the food processing machinery. They would be trained about the quality of machinery related to suitability for the food grade, whether it is corrosion and contamination free or not. The manual would be development towards good manufacturing practices.

c) Quality certifications and standards: Processors would be aware about the prevailing quality standards and certifications towards products developed through litchi. They would be trained about the process to obtain different licenses and quality management systems.

d) Entrepreneurship skills: It is also very important to build entrepreneurship skills in the processors for better negotiations, documentation, record-keeping and marketing of the litchi made products.

R&D Institutions

Research and Development is an important part of product development, engaging leading research institutions in product development and training. For example Research station of Guava in Patialla,. The facility available in research station can be used by farmers, processors, retailers, FPCs etc during guava production season for small scale processing, training and product development. FPC formed by NABARD, SHGs can also use the facilities of NRC for processing of guava products as well as storage. Similarly, product development for ODOPs like Litchi facilities of Litchi estate, Sujanpur, Pathankot can be utilized. This help in getting quality produce by training farmers on cultivation and post-harvest management.

PMFME scheme should have provision for R&D activities for the development of ODOP and potential non ODOP for enhancement of processing activities. This will help to leverage expertise of R&D institutions and develop unique value added products from ODOP and potential non-ODOP. The state should have the discretion of approval of R&D proposals.

Export Promotion

ODOPs like Jaggery, Achaar & Murabba is already getting exported to other countries from the state however to provide a complete package for export promotion of processing of local Litchi would help in creating global footprint of litchi-based products from Pathankot. Setting up packhouses and modern processing centres for export promotion in collective way through FPCs and SHGs may be planned.

Similarly, Kinnow which is one of the unique products of Punjab which could also be targeted for export promotion to increase its exports to other countries.

a. **Convergence with ongoing schemes of other departments**

There are various schemes in the micro food enterprises space which directly or indirectly support the food processing activities. As discussed in detail in the government scheme section of the report, schemes like Mission on Integrated Development of the Horticulture, Animal Infrastructure Development Fund, Agri infrastructure fund, Formation and Promotion of 10,000 FPOs, SFURTI scheme etc. Convergence with these schemes through line departments would augment the results of the PM FME scheme.
For example, in the district of Pathankot, various SHG members informed that there is space crunch to store finished products and raw material. Through schemes like Agri infrastructure fund and Integrated Scheme of Agricultural Marketing etc.

While government is promoting formation of 10,000 FPOs in the entire country, regular sensitization of the concerned department officials at the state and district level about the scheme and its benefits would help in promoting food processing among the FPOs.

b. **Proposed Interventions:**

Based on secondary research and stakeholder consultation, we understand that product specific interventions are required. We have detailed out about each of the ODOP in the section 5 of the report. We have also detailed out potential value added products and model DPR with project cost, area required and plant & machineries for each of the value added products proposed.

i. Pickle and Murabba

Pickle and Murabba is the select ODOP of the Amritsar district. Amritsar district is known for Amla and Carrot Murabba across the country. There are more than 60 micro food enterprises units in the district involved in pickles and murabba. Major challenges faced by existing micro food enterprises involved in ODOP product are as follow;

- Non availability of testing laboratory for products in the close vicinity of the units.
- Marketing and branding of products for products in mass market (Only Limited lead for selling available).
- Financial Limitations for overall development of the firm. Getting working capital loan is a challenge

Based on the challenges faced by the existing micro food enterprises following interventions had been suggested;

- Technology upgradation & expansion of existing units
- Setting up of basic food testing lab in each unit to ensure quality
- Setting up of a common NABL food testing lab to ensure quality

- Setting up of a common infrastructure/incubation centre with state of art facilities for achar & murabba
- Capacity building about Good Management Practices and innovative products

ii. Poultry/Meat/Egg

Poultry/Meat/Egg is the select ODOP of the Barnala district. There are more than 50 commercial layer farms (about 50 lac birds) in the district. There is no modern broiler slaughter and dressing plant in the district. There are a large number of meat shops in the district where live bird is cut manually, cleaned and sold to the consumer. Major challenges faced by existing micro food enterprises involved in ODOP product are as follow:

- Non availability of processing facilities in the district
- Transport of fresh chicken to the nearby district like Ludhiana for processing

Based on the challenges faced by the existing micro food enterprises following interventions had been suggested,

- Setting up of common facilities for processing of poultry
- Setting up feed units
- Encouraging entrepreneurs to set up processing units
- Capacity building of entrepreneurs about processing
- Upgradation of daily fresh chicken enterprises in the district

iii. Jaggery and allied products

Jaggey and allied products is the select ODOP of the Hosiarpur, Gurdaspur, SAS Nagar and Fatehgarh Sahib district. There are more than 150 jaggery units in each of the district. Most of the units are at farm level and follow traditional method of processing. Major challenges faced by existing micro food enterprises involved in ODOP product are as follow:

- Price competitiveness from migrant processors from UP
- Adulteration
- Unhygienic practices followed in processing: Micro enterprises follow conventional and unhygienic practices for sugarcane processing.
- Indigenous technologies like open pan method and use of adulterants
- Marketing and branding: Generally, jaggery is sold to traders who in turn sell the produce in Delhi NCR. These products are unbranded and thus fetch lower prices.

Based on the challenges faced by the existing micro food enterprises following interventions had been suggested:

- Technology upgradation & expansion of existing units to maintain hygiene in the unit's premises
- Awareness creation among micro enterprises for the need and benefits to maintain hygiene and obtain statutory approvals
- Setting up of basic food testing lab in each unit to ensure quality
- Branding and marketing of the products
- Product diversification
- Capacity building about Good Management Practices and innovative products

iv. Litchi

Litchi is the select ODOP of the Pathankot district. There is minimal/no processing of Litchi in the district. In the district a Litchi grower association is present with 100+ members. In the district the growers/farmers sell their orchard to pre harvest contractor and this practice is followed by 95%-98% farmers. As the shelf life of litchi is very short the farmers have to sell it on the same day.

Major challenges faced by existing micro food enterprises involved in ODOP product are as follow;

- Distress sale due to high supply
- High post-harvest losses

Preservation and processing of litchi into different products can help growers and entrepreneurs overcome glut and distress sale situation, because the processed products have long shelf life that allows for planned and organized distribution according to market demand. Litchi can be processed into various value-added products and offers huge potential for entrepreneurship in the food processing sector.

Based on the challenges faced by the existing micro food enterprises following interventions had been suggested:

- Encourage entrepreneurs to set up processing units
- Setting up of integrated pack house with reefer vehicles.
- Reefer vehicle can be supported through MIDH scheme through convergence
- Promotion of processing of Litchi

v. Potato

Potato is the select ODOP of the Jalandhar district. There are numerous micro food enterprises of potato processing in the district. Major challenges faced by existing micro food enterprises involved in ODOP product are as follow;

- Dominance of seed potato
- Distress sale due to high supply

Based on the secondary research and primary interaction with the stakeholders, it was observed that in spite of having relatively easy opportunity in potato processing, growers are not very confident about taking up processing. Existing small units needs to be provided with marketing support as they find it tough to access remunerative market. Handholding support on other aspects also needs to be provided to existing units for enabling them to scale up the activities. Price for table potatoes is totally dependent on demand and supply situation and can proved to be highly fluctuating. Although potato has longer shelf life as compared to other vegetables, still improper handling and storage of potato is also one challenging aspect which usually results in high amount of wastage. Common infrastructure in terms cold storage can be created in the district to increase the accessibility to storage facility for the cultivator. Easy accessibility to cold storage will help in fetching comparatively high prices for the cultivators.

Efforts can be made for making the supply chain more efficient by reducing the wastage and intermediaries. Opportunities should be explored for reducing the tax burden on sale of the potatoes in APMC. Contract farming can be promoted to help the cultivators in overcoming price fluctuation challenges. Some products like French fries, aloo bhujia requires relatively high level of processing as compared to products like potato chips, which can be made with simpler processing activities. Products with simpler processing activities needs to be promoted in order to increase the share of processing.

vi. Milk and milk based products

Milk and milk based products is the select ODOP of the Mansa, Faridkot and Sri Mukatsar Sahib district. There are over 150 small and micro enterprises, including ‘sweet shops’ who processes 500 litre to 1,500 litre per day of milk to manufacture paneer, lassi, curd, ghee, khyoa, cream, kulfi, etc. in each of the select districts.

. Major challenges faced by existing micro food enterprises involved in ODOP product are as follow:

- **Dominance of large players**
- **High post-harvest losses**
- **Marketing and branding**

Based on the challenges faced by the existing micro food enterprises following interventions had been suggested:

- There are number of traditional units involved in value addition of milk based on conventional methods like using iron pans to prepare ghee etc. Upgradation of existing micro enterprises involved in milk processing is required to improve quality and upscale the production.
- Promoting SHGs and FPOs involved in milk aggregation to set up small scale processing unit
- Support these existing units through PM FME as well as Animal Infrastructure Development Fund
- FPOs/SHGs/individuals can be encouraged to set up small integrated dairy farm for farming and processing. Dairy farm can be supported through scheme for dairy of NABARD, capital subsidy from PM FME and interest subvention from Animal Infrastructure Development Fund

vii. Honey

Honey is the ODOP of the Bhatinda. There are about 30 honey processors in district Bathinda. Progressive Beekeepers Association has 350 members engaged in collection and extraction of mustard honey. In 2008-09, the honey production in the district was 750 MT. In the district, a Honey processing cluster is in village Tungwali. The center would become a unique project where not only honey would be collected and prepared for the packing and sale, but it will also be equipped with machines to make everything required for beekeeping.

Major challenges faced by existing micro food enterprises involved in ODOP product are as follow:

- Lack of year round raw material: Nectar based crops are seasonal in nature, in the absence of nectar inducing crops like Mustard, beekeepers move to near by districts like Hanumangarh in Rajasthan
- Lack of processing units near to production cluster. There is a unit in Tungwali village which processes at INR 5 per kg however it is far off.
- Lack of storage spaces
- Marketing and branding: Generally, honey is sold in fairs, weekly haats and exhibitions where producers get remunerative prices for their produce. But these marketplaces are seasonal in nature and in absence of these producers sells the produce to the traders, who give very low prices for the produce.
- Unawareness about processing technologies
- Marketing, branding and packaging

Based on the challenges faced by the existing micro food enterprises following interventions had been suggested:

- Technology upgradation & expansion of existing units
- Setting up of basic food testing lab in each unit to ensure quality
- Capacity building about beekeeping, honey processing and packaging
- Handholding support for branding, packaging and marketing

viii. Fruits and Vegetable based ODOPs

There is minimal to no processing in most of the ODOPs identified like Chillies, Kinnow, Guava, Pear, Tomato, Peas etc.

. Major challenges faced by existing micro food enterprises involved in ODOP product are as follow;

- High post-harvest losses
- High demand for fresh fruits & vegetables
- Marketing and branding
- Unawareness about processing technologies

Based on the challenges faced by the existing micro food enterprises following interventions had been suggested;

- Micro food enterprises may be promoted to set up processing units.
- With the help of horticulture department farmers may be encouraged to grow processable varieties.
- Setting up cold chain infrastructure
- Setting up integrated packhouse

Based on the challenges identified, potential interventions are summarized below;

Sl. No.	ODOP	District	Potential value added products	Required interventions
1.	Pickle & Murraba	Amritsar	Pickle & Murraba	• Technology upgradation & expansion of existing units • Setting up of basic food testing lab in each unit to ensure quality • Setting up of a common NABL food testing lab to ensure quality • Setting up of a common infrastructure/incubation centre with state of art facilities for achar & murabba • Capacity building about Good Management Practices and innovative products
2.	Poultry meat & fish product	Barnala		• Setting up of common facilities for processing of poultry • Setting up feed units • Encouraging entrepreneurs to set up processing units
3.	Jaggery and Allied	Hosiarpur	Sugarcane juice, jaggery, chikky, powder, liquid jaggery,	• Technology upgradation & expansion of existing units • Setting up of basic food testing lab in each unit to ensure quality • Branding and marketing of the products • Product diversification
4.		Fatehgarh Sahib		
5.		Gurdaspur		

Sl. No.	ODOP	District	Potential value added products	Required interventions
				• Capacity building about Good Management Practices and innovative products
6.	Litchi	Pathankot	Pulp, Juice, Jam	• Encourage entrepreneurs to set up processing units • Setting up of integrated pack house with reefer vehicles. • Reefer vehicle can be supported through MIDH scheme through convergence
7.	Potato	Jalandhar	Chips, snacks	• Encourage entrepreneurs to set up processing units
8.		Moga		
9.	Tomato	Kapurthala	Tomato, ketchup, puree, paste, powder, canned tomato, sun dried tomato	• With the help of horticulture department farmers may be encouraged to grow processable varieties. • Encourage entrepreneurs to set up processing units
10.	Peas	SBS Nagar	IQF peas, dehydrated peas, fried peas	• Encourage entrepreneurs to set up processing units
11.	Honey	Bathinda		• Technology upgradation & expansion of existing units • Setting up of basic food testing lab in each unit to ensure quality
12.	Milk & Milk products	Sri Mukatsar Sahab	Paneer, Ghee, Pasteurized milk, UHT milk, flavored milk, Curd, lassi, butter milk etc.	• Technology upgradation and expansion of traditional micro enterprises involved in value addition of milk • Promoting SHGs and FPOs involved in milk aggregation to set up small scale processing unit • Support these existing units through PM FME as well as Animal Infrastructure Development Fund
13.		Mansa		
14.		Faridkot		
15.				

Sl. No.	ODOP	District	Potential value added products	Required interventions
				• FPOs/SHGs/individuals can be encouraged to set up small integrated dairy farm for farming and processing. Dairy farm can be supported through scheme for dairy of NABARD, capital subsidy from PM FME and interest subvention from Animal Infrastructure Development Fund
16.	Guava	Patiala	Pulp, juices, jelly, Guava burfi, Pickle	• Micro food enterprises may be promoted to set up processing units. • With the help of horticulture department farmers may be encouraged to grow processable varieties.
17.	Kinnow	Fazilka	Juice, Concentrate, pulp	• Setting up of integrated pack house with sorting, grading, waxing and packaging facilities
18.	Pear	Taran	Jam, Jelly, dehydrated Pear	• Encourage entrepreneurs to set up processing units
19.	Chillies	Ferozpur	Chilli powder, Oleoresin extraction, sauces, pickles	• Technology upgradation & expansion of existing units • Setting up of basic food testing lab in each unit to ensure quality • Capacity building about Processing, Good Management Practices and innovative products
20.	Bakery	Ludhiana	Bakery products	• Technology upgradation & expansion of existing units • Branding and marketing of the products

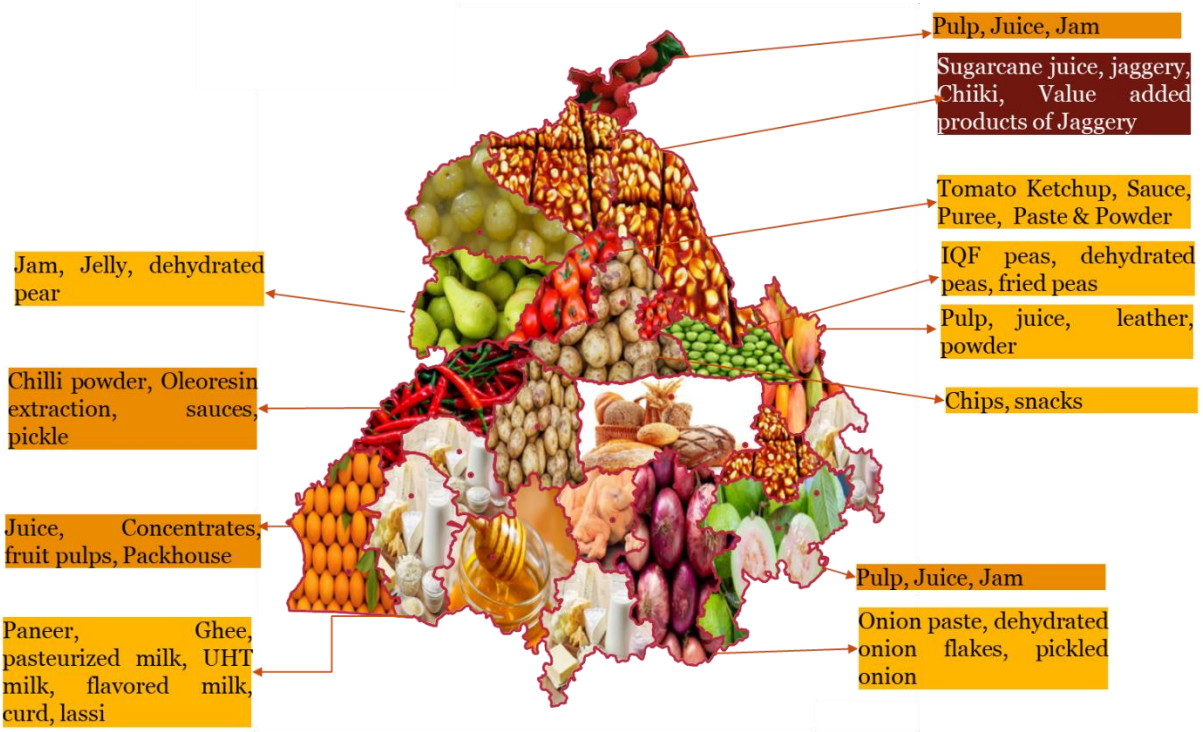


Figure 24: Potential value added products from ODOP

Common facilities: As per the interaction with different stakeholders need to set up common facilities to cater to the needs of micro food enterprises. Common facilities can be of different nature based on need of the micro food enterprises in the district. In the district of Barnala where poultry, meat and fisheries is the ODOP and there is ample production of broiler but there is absence of processing facilities, Given the nature of the enterprises involved in broiler and layer farming a common facility centre for processing of birds from slaughtering to portioning to blast freezing can be set up. Modalities of operations can be worked out based on consultation with the enterprises in the district. Likewise, in the district of Amritsar, stakeholder informed that to ensure quality of the products to fetch better prices there is a need to set up NABL accredited food testing lab in the close vicinity of the food enterprises. This will help units get their products tested.

Common marketing & branding: From our secondary research and interaction with individual micro food enterprises, SHG members, FPO member it was evident that branding and marketing is a major challenge. Most of the SHGs and FPOs sell their products in the weekly haats organized in the nearby city or fairs/exhibitions. In the absence of proper packaging, branding micro food enterprises reach to the buyers are limited. Therefore, there is a dire need of an umbrella brand at the state level to support micro food enterprises across the state for marketing and branding.
The umbrella brand can ensure quality, Good Management Practices to be followed, uniformity of products, marketing, branding, certifications etc. Initially the common brand can market 2-3 products and eventually can take up more products.

Incubation centre: In some of the districts processing of the select ODOP is in a naïve stage, there is a need to set up incubation centre in these districts to incubate entrepreneurs about processing. Each incubation centre can have two lines of processing of the select ODOP. Incubation centre may be set up with processing facilities, training area, library etc. Micro food enterprises can visit the centre and can attend trainings in these incubation centres. Interested micro enterprises can use the plant & machinery on user charge basis. For example; Guava processing in Patiala is at a very primitive stage, to boost Guava processing in the district incubation centre can be set up. To set up incubation centre tie up with

existing government R&D institutes in agri and allied sector can be targeted. This will provide existing base of subject matter experts, readily available land parcel to set up incubation centre.

Appendix A. - Appendices

A.1. Incentives available for the beneficiaries [92]

In India, National Bee Board (NBB) has been designated as the nodal agency for overall development and promotion of scientific beekeeping in the country. Under *Atmanirbhar Bharat Abhiyan*, a sum to the tune of Rs. 500 crore has been allocated towards beekeeping.[93] Centrally sponsored schemes are Mission for Integrated Development of Horticulture (MIDH) and National Beekeeping and Honey Mission (NBHM).

For state level assistance, an identified State Designated Agency (SDA) or any institution/society having capability would be responsible - as per MIDH scheme guidelines. The coordination level at the state level would be taken care of by the National Bee Board.

Table 32: Centrally sponsored schemes for beekeeping

Sl.	Purpose	Cost norms	Pattern of assistance
1.	Pollination support through beekeeping[94]		
i.	Production of nucleus stock (Public sector)	Rs. 20 lakhs	100% of the cost.
ii.	Production of bee colonies by bee breeder	Rs. 10 lakhs	40% of cost for producing min. of 2000 colonies / year
iii.	Honeybee colony	Rs. 2000 / colony of 8 frames	40% of cost limited to 50 colonies / beneficiary
iv.	Beehives	Rs. 2000 / hive	40% of cost limited to 50 colonies / beneficiary
v.	Equipment including honey extractor (4 frame), food grade container (30 kg), net, including complete set of Bee keeping equipment.	Rs. 20,000 / set	40% of the cost limited to one set per beneficiary

Apart from the above-mentioned scheme, there is National Beekeeping and Honey Mission (NBHM)[95] which is focusing on multiple facets of apiculture. The scheme is divided into mini missions 1, 2 and 3 for segregating the assistance pattern into different heads. Mini mission 1 focusses on production & productivity improvement of various crops through adoption of scientific beekeeping by the farmers/ beekeepers. It also lays emphasis on capacity building activities and development of infrastructure for training institutions, etc. Mini mission 2 post-harvest management, storage, value addition, marketing, processing units, upgradation, etc. Mini mission 3 lays emphasis on mainly R&D activities.

Pattern of assistance for NBHM is detailed below:

Sl.	Scheme and components	Pattern of assistance
2.	NBHM	

[92] This section covers schemes related specific to beekeeping. Other schemes are covered in section 3 and annexures of this report.
[93] GoI press release dated 22 May 2020: Union Agriculture Minister says government promoting Beekeeping as part of its aim to double farmers' income
[94] MIDH Scheme guidelines
[95] NBHM scheme guidelines

i.	Individual beneficiaries/ Societies/ Firms / Companies	50 %
ii.	Self Help Groups (SHGs)/ Joint Liability Groups (JLGs)/ Farmers/ Beekeepers Interested Groups (FIGs) / Co-operatives/ FPOs/ FPCs/ Member Beekeepers' Federations (MBFs) of NBB/ MBFs registered with NBB	75 %
iii.	National/ State level Governmental Organizations, including NBB, ICAR, State Agricultural Universities (SAUs)/ Central Agricultural Universities (CAUs)	100 %
iv.	Individuals, institutions/ organizations/ societies/ Co-operatives/ Self Help Groups (SHGs)/ Joint Liability Groups (JLGs)/ Farmers/ Beekeepers Interested Groups (FIGs)/ Societies/ Firms /Companies/ FPOs/ FPCs in NE region	90 %
v.	Government agencies/ organizations, etc. However, for capacity building programmes, including trainings, seminars, skill development for farmers/ beekeepers, officials, in NE region	100 %
vi.	Implementing agencies	100 %

9.1.1.1.1. Schemes related to Pre-harvest

Table 33: Schemes under MIDH

Purpose	Cost Norm	Pattern of assistance
Hi-Tech nursery **(4 ha)**	INR 25 lakh per ha	@ 40% of cost, subject to a maximum of INR 40 lakh/unit, for a maximum of 4 Ha
Small nursery (1 ha)	Rs. 15.00 lakh/ha	@50% of the cost subject to maximum of INR 7.5 lakh
Upgradation of nursery	Up to INR 10.00 lakh/ nursery of 4 ha	50% of cost to private sector subject to a maximum of INR 5.00 lakh/nursery
Setting up of new tissue culture units	INR 250 lakh per unit	@ 40% of project cost

9.1.1.1.2. Schemes related to Post-harvest infrastructure

a) State sponsored schemes

Table 34: Financial assistance from PAGREXCO

Description	*Pattern of assistance*
A. Domestic market	
Subsidy on pre-cooling-cum-cold storage	50%
Subsidy on non-wooden packing material	25%
B. Exports of flowers, fruits & vegetables	
Subsidy on non-wooden packing material	30%
Subsidy on air freight for partial load (maximum Rs.10/- per kg. for Asian and Rs.25/- per kg. for other countries)	30%
Subsidy on air freight for full load (maximum of Rs.20/- per kg.)	50%

b) Centrally sponsored schemes

Table 35: Financial assistance from MIDH schemes

Purpose	Cost Norm	Pattern of assistance
Pack House	INR4.00 lakh/unit with size of 9Mx6M	@50% of capital cost
Integrated pack house with facilities	INR 50.00 lakh per unit with size of 9Mx18M	
Mobile pre- cooling unit	INR 25 lakh	
	Rs. 26 lakh for 9 MT, and pro rata basis for lesser capacities	
Integrated Post Harvest Management Projects	INR 145 lakh	@ 50% of project cost limited to Rs. 72.50 lakh per project

Table 36: Scheme for infrastructure development and market development by APEDA

Components	Pattern of Assistance
A) Assistance for purchase of specialized transport units for animal products horticulture and floriculture sector.	25% of the cost subject to a ceiling of Rs.0.25 million per beneficiary.
B) Assistance to exporters/producers/growers/Cooperative organization and federations for horticulture and floriculture sector for	
i) Mechanization of harvest operation of the produce.	25% of the cost subject to a ceiling of Rs.0.5 million per beneficiary

Components	Pattern of Assistance
ii) Setting up of sheds for intermediate storage and grading/storage/cleaning operation of produce.	25% of the cost of equipment subject to a ceiling of Rs.0.5 million per beneficiary
iii) a) Setting up of mechanized handling facilities including sorting, grading, washing, waxing, ripening, packaging & palletization etc.	25% of the cost of equipment subject to a ceiling of Rs.1 million per beneficiary
b) Setting up of both pre-cooling facilities with proper handling system as well as cold storage for storing.	25% of the cost of equipment subject to a ceiling of Rs. 1 million per beneficiary
c) Setting up of integrated post-harvest-handling system (pack houses / green houses with any two or more of the above facilities)	25% of the cost subject to a ceiling of Rs. 2.5 million per beneficiary
d) Setting up of vapor heat (treatment, electronic beam processing or irradiation facilities	50% of the cost subject to a ceiling of Rs.2.5 million per beneficiary
f) Assistance for setting up of environment control system e.g. pollution control, effluent treatment etc.	25% of the cost subject to a ceiling of Rs.2.5 million per beneficiary
1. Setting up of specilised storage facilites such as high humidity cold storage deep freezers, controlled atmosphere (CA) or modified atmosphere (MA) storage etc.	25% of the cost subject to a ceiling of Rs.1 million per beneficiary
Schemes for Market Development	
Components	***Scale of Assistance***
(A) i) Activity for development of packaging standards and design.	APEDA's internal scheme for development work through involvement of institutions / organization in India and abroad with the cost sharing with exporters and / or organizations involved in the export promotion. Maximum amount in case of sharing with exporters / organization is Rs.0.5 million or 50% of the cost of development whichever is less or 100% in -case of APEDA
ii) Assistance to exporters for use of packaging material as per standards and specifications developed or adopted by APEDA.	30% subject to ceiling of Rs.0.15 million per beneficiary.
iii) Assistance to Exporters, Producers, Growers, service providers, Co-operative Organizations etc. For purchase of " Intermediate Packaging Material " for domestic transportation of produce .	50 % of the cost of the material subject to ceiling of Rs.0. 5 million.
B) i) Assistance to exporters, growers organizations, trade associations for conducting surveys, feasibility studies etc.	50% of the total cost subject to ceiling of Rs.0.2 million per beneficiary.
ii) Assistance to Semi Government, State Government, Public Sector	50% of the project cost subject to ceiling of Rs.1 million per beneficiary.

Components	Pattern of Assistance
Undertakings for Conducting surveys, feasibility studies etc.	
iii) Brand publicity through advertisement etc.	40% of the cost subject to a ceiling of Rs. 0.1 million per beneficiary.
iv) Export promotion by APEDA undertaking activities like buyer-seller meet, Product promotion, exchange of delegations, participation in Exhibitions / Fairs / Events etc.	100% of the cost.

A.2. Field Visit photographs

Visit to The Unati Cooperative Marketing cum Processing Society Ltd.

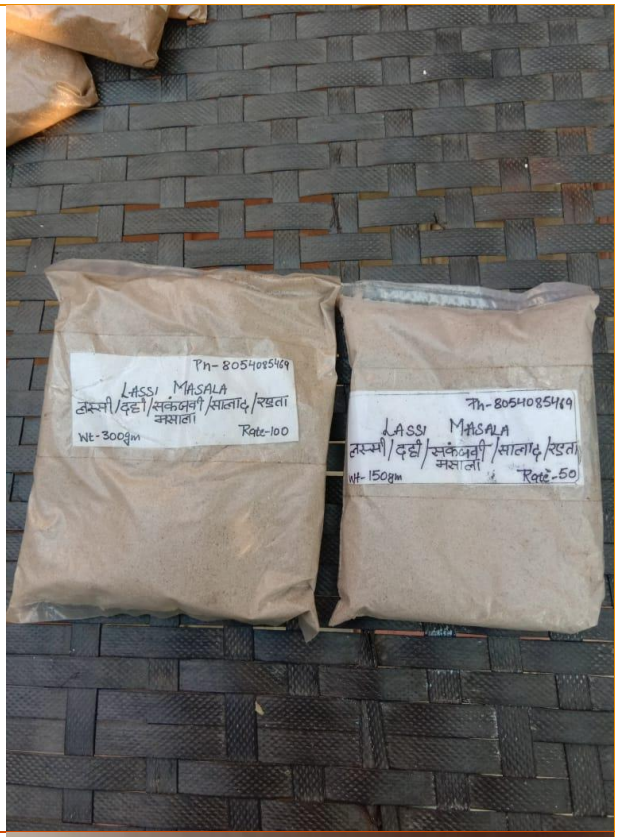
Visit to Jaggery units in Hosiarpur district






Workshop in Pathankot

Pickle units run by SHGs



Visit to FPO processing unit in Bhatinda


MELLIFERA
METHI
ZEERA
TURMERIC POWDER
CHAAT MASALA
TEA MASALA

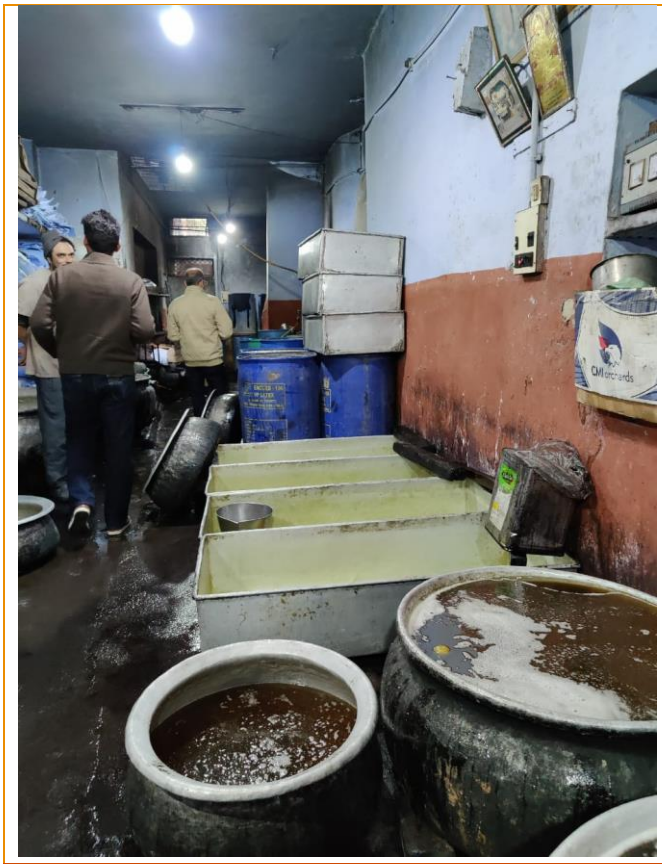

MELLIFERA
Net Wt.
350 gms
Premium
Garlic
Pickle

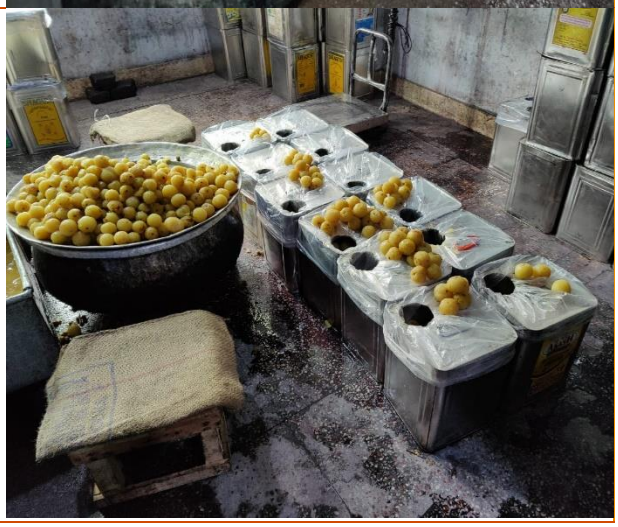

MELLIFERA
Premium
CHAAT MASALA
INGREDIENTS
Nutritional Values
MRP ₹
Incl. of all taxes
Lot No.
Pkd.
65/-
CM01
10/20
Mellifera Farmer Producer Company Limited
Customer Care : 95116 95116
fssai


Mellifera
KISSAN HUT
We are not only packers but also producers
Whatsapp Contact: 95116-95116

Visit to layer farm in Barnala

Visit to Murabba units in Amritsar






Amir's
शर्वत मैंगो
50/-रू में
शुद्ध बादाम रोगन
निकाला जाता है।


84279-7665
सबसे पुरानी व मशहूर दुकान
MURABBE
TRAIN BRAND
CHAND RAKESH KUMAR

A.3. Questionnaire of Individual enterprises

Name of the Respondent: ..... Mobile No: .....

Name & address of Firm: _____

Type of Firm (Individual/Partnership etc.) :

1. What is the nature of your business?
    a. Processor
    b. Aggregator
    c. Distributor
    d. Other .....

2. What is the average yearly business turnover for last three years
    a. 0 - 50 Lakhs
    b. 50 -100 Lakhs
    c. 100 Lakhs to 200 Lakhs
    d. 200Lakhs to 500 Lakhs
    e. >500 Lakhs

3. If processing, which produce is processed
    a. Fruits
    b. Vegetables
    c. Oil seeds,
    d. Sugarcane
    e. Honey
    f. Cereals
    g. Other .....

4. What products do you prepare through processing
    a. Jam / Jelly
    b. Pickle
    c. Pappad
    d. Jaggery
    e. Other.....

5. From where you procure the raw material for processing
    a. Direct from farmers
    b. APMC
    c. Trader
    d. Other district (name of district)
    e. Any other source.....(Name).....

6. Whether enough raw material is available in the district/ in the area?
    a. Yes b. No

7. If No, what are the constraints in getting the raw material?
    a. Not know from where to procure it
    b. High price of raw material in off season
    c. Not getting enough material from the area

d. Don't have storage facility
e. Any other (specify).....

8. Where do you sell the products
   a. Local market
   b. Retail chains
   c. Direct to consumers
   d. Other big processor
   e. Fairs/exhibitions
   f. Any other .....(name)....

9. Do you sell these products by brand name? If yes, then brand name .....
   a. Yes b. No, if no, reason/why .....

10. Do you supply the processed products, without branding, to other companies or do you process it on other/their behalf? If yes, to whom (name of player) .....
    a. Yes b. No

11. What are the constraints faced in marketing of the products/produce?

    _____

    ---

12. What is the USP of your product, which ,makes it better than the competitors.

    _____

13. How many staffs you have in your processing units? Mention Total Nos .....

14. How many of them are skilled and unskilled worker?

    Skilled - _____ Unskilled _____

15. From where you get the skilled manpower for the operations
    a. From the district b. neighboring districts
    b. other states .... (specify)

16. What is the average education of your staff?
    a. 10th Pass b 12th Pass

    c. Graduation and above

17. How many people are required (adequate number of staff) to run your type of unit / processing plant?
    a. 1 -3 b. 4-6

c. 6-10 d. >10

18. Do you have the required knowledge of operating your processing facility?
    a. Yes, b. No.

    if No, then what you would suggest improving the technical know-how of your facility

19. Whether adequate public infrastructure is available like road, water or electricity?
    a. Yes b. No

    If No, what are the constraints or suggestion to improve it

    _____

    _____

20. Any common facility/infrastructure (for eg for cleaning, grading and sorting, storage, shed etc.) is available?
    a. Yes b. No

17.1 If yes, what it is? _____

17.2 Numbers of such facilities _____

17.3 Is it private of govt.? _____

17.4 What fee is charged? _____

17.5 If No, then whether any common facility/ies is required? Yes / No

if yes, what type of common facility/ies you think will be beneficial or required and what will be the affordable fee?

_____

_____

21. Do you give product sample for testing?
    a. Yes b. No

18.1. If yes, what testing facilities are available in the cluster?

Govt. Labs _____ Pvt. Labs_____

18.2 Is there any need for additional testing facility Yes / No

22. What is the production process in your unit
    a. Manual operations b. Mechanized operations
    b. Both

23. Whether you get/received information on technology upgradation or on latest technologies?
    a. Yes b. No

If yes, from where are you getting the information?

_____

if no, why?

a. don't know whom to approach for right information,
b. don't have proper financial support to adopt new technology
c. any other reason _____

24. What are the regulatory constraints you faced while setting up the unit

_____

25. Have you received any financial support in setting up of your unit?
    a. Yes b. No

If yes, from where ?

a. NABARD

b. Supported under govt. scheme (name of scheme)

c. supported by any other (name)

26. Have you taken any bank loan for setting up the unit? Yes / No
27. If yes, then did you face any constraint in getting the loan approved from bank?

_____

_____

28. Have you been able to maintain the repayment schedule for bank loan?
    a. Yes No(Why)
29. Have you received any training ?
    a. Yes No.

If yes, then on which topic ?

a. On marketing of the produce
b. On processing
c. On branding

Where you have received these training ? name of source

30. In case of any query, from where you get support/resolution
    a. State govt
    b. District administration
    c. NABARD,
    d. NGO,

e. friends etc.

31. Do you required any support for enhancing your business and skills? Yes/ No

32. What are the constraints you faced in the entire value and supply chain from production to marketing of the produce?

_____

_____

33. Queries related to Government scheme

33.1 Have you availed any subsidy from government for your setting up of your food processing unit?

a. Yes
b. No

33.2 If no, then please mention the reason for not availing any subsidy

a. Lack of awareness
b. No existing scheme to assist the unit
c. Due to untimely release
d. Others (Please specify)

33.3 If yes, please mention the scheme under which you have availed assistance

a. SRLM
b. PMEGP
c. SFURTI
d. Others (please specify)

33.4 How did you come to know about the scheme _____

33.5 Please mention the assistance availed (mention details)

a. Capital incentive _____
b. Fiscal incentive_____
c. Seed capital/venture capital _____
d. Working capital assistance _____
e. Training cost reimbursement
f. Participation fee exemption for participation in fair/exhibition_____
g. Assistance in marketing_____

33.6 Please mention issues faced in availing subsidy_____

33.7 Based on your experience please mention the areas/components for which you would require assistance for operation or establishment of food processing unit/enterprises

_____

_____

A.4. Questionnaire of SHGs/FPOs/Cooperatives

Type of the Collective (SHG/FPO/Cooperative): .....

Name and role(CEO, BoD) of the respondents ..... Mobile No: .....

Name & address of Organization :

_____

1. What is the total number of members involved in the business?

2. What is the area of operation for the organization(number of villages, blocks)

_____

3. Detail of the supporting organization(if any)

_____

4. What is the nature of your business?
    a. Processor
    b. Aggregator
    c. Distributor
    d. Other .....

5. What is the average yearly business turnover for last three years
    a. 0 - 50 Lakhs
    b. 50 -100 Lakhs
    c. 100 Lakhs to 200 Lakhs
    d. 200Lakhs to 500 Lakhs
    e. >500 Lakhs

6. If processing, which produce is processed
    a. Fruits
    b. Vegetables
    c. Oil seeds,
    d. Sugarcane
    e. Honey
    f. Cereals
    g. Other .....

7. What products do you prepare through processing?
    a. Jam / Jelly
    b. Pickle
    c. Pappad
    d. Jaggery
    e. Other.....

8. How do you procure the raw material for processing

9. Whether enough raw material is available in the district/ in the area?
    a. Yes b. No

10. If No, what are the constraints in getting the raw material?

a. Not know from where to procure it
b. High price of raw material in off season
c. Not getting enough material from the area
d. Don't have storage facility
e. Any other (specify).....

11. Where do you sell the products
    a. Local market
    b. Retail chains
    c. Direct to consumers
    d. Other big processor
    e. Any other .....(name)....

12. Have you been able to establish any type of institutional linkages for the business

    a. Yes(Provide details) b. No

13. Do you sell these products by brand name? If yes, then brand name .....
    a. Yes b. No, if no, reason/why .....
14. Do you supply the processed products, without branding, to other companies or do you process it on other/their behalf? If yes, to whom (name of player) .....
    a. Yes b. No

15. What are the constraints faced in marketing of the products/produce?

    _____

16. What is the USP of your product, which ,makes it better than the competitors.

    _____

17. How many staffs you have in your processing units? Mention Total Nos .....

18. How many of them are skilled and unskilled worker?

    Skilled - _____ Unskilled _____

19. From where you get the skilled manpower for the operations
    a. From the district b. neighboring districts
    b. other states .... (specify)

20. What is the average education of your staff?

a. 10th Pass b 12th Pass

c. Graduation and above

21. How many people are required (adequate number of staff) to run your type of unit / processing plant?

a. 1 -3 b. 4-6

c. 6-10 d. >10

22. How is the team's knowledge and understanding of the Business Operations and compliances?

23. Whether adequate public infrastructure is available like road, water or electricity?

a. Yes b. No

If No, what are the constraints or suggestion to improve it

_____

_____

24. Any common facility/infrastructure (for eg for cleaning, grading and sorting, storage, shed etc.) is available?

a. Yes b. No

17.1 If yes, what it is? _____

17.2 Numbers of such facilities _____

17.3 Is it private of govt.? _____

17.4 What fee is charged? _____

17.5 If No, then whether any common facility/ies is required? Yes / No

if yes, what type of common facility/ies you think will be beneficial or required and what will be the affordable fee?

_____

_____

25. Do you give product sample for testing?

a. Yes b. No

18.1. If yes, what testing facilities are available in the cluster?

Govt. Labs _____ Pvt. Labs_____

18.2 Is there any need for additional testing facility Yes / No

26. What is the production process in your unit

a. Manual operations b. Mechanized operations

b. Both

27. Whether you get/received information on technology upgradation or on latest technologies?

a. Yes b. No

If yes, from where are you getting the information?

_____

if no, why?

d. don't know whom to approach for right information,

e. don't have proper financial support to adopt new technology

f. any other reason _____

28. What are the regulatory constraints you faced while setting up the unit

_____

29. Have you received any financial support in setting up of your unit?

a. Yes b. No

If yes, from where ?

a. NABARD

b. Supported under govt. scheme (name of scheme)

c. supported by any other (name)

30. Have you taken any bank loan for setting up the unit? Yes / No

31. If yes, then did you face any constraint in getting the loan approved from bank?

_____

_____

32. Have you been able to maintain the repayment schedule for bank loan?

a. Yes No(Why)

33. Have you received any training ?

a. Yes No.

If yes, then on which topic ?

d. On marketing of the produce

e. On processing

f. On branding

Where you have received these training ? name of source

34. In case of any query, from where you get support/resolution
    a. State govt
    b. District administration
    c. NABARD,
    d. NGO,
    e. friends etc.
35. Do you required any support for enhancing your business and skills? Yes/ No

36. What are the constraints you faced in the entire value and supply chain from production to marketing of the produce?

    _____

    _____

A.5. List of FPOs promoted by NABARD under PRODUCE fund

Sl No.	District	FPO name	Date of Registration	FPO Address	Contact	Commodity	Business Activity
1	Amritsar	Chogawan Fruit and Vegetables co-operative Society Ltd.	12-31-2015	VPO Chawinda Kalan, Chogawan, Amritsar, Punjab.	8146844888	Vegetable, Fruits	Aggregation and Marketing
2	Amritsar	Verka Fruit and Vegetable co-op society	04-25-2016	Village Manawala p.o. Jandiala, District Amritsar	98881664990	Aggregation, marketing of vegetables	Aggregation
3	Amritsar	The Beas Fruit and Vegetables co-operative Society Ltd	04-25-2016	Village Jodhe, P.O. Beas, Amritsar, Punjab.	9815758519	Vegetables, Fruits	Aggregation and Marketing
4	Amritsar	Amitoj	Dt- 30-03-2016	Vill. Bhakha Tara singh Tehsil Ajnala Distt. Amritsar	9888702517	Honey, Sarson Oil, Apiculture	Processing
5	Amritsar	Jagriti	Dt- 30-03-2016	Vill. Makowal Tehsil Ajnala Distt. Amritsar	9463570646	Sarson Oil ,Jaggery, Black gram, Pulses, Foodgrains	Others
6	Bathinda	Bathinda Farmer Producer Company	03-21-2014	village Behman Diwana	8699585171	Seed, Wheat	Input Sales, Input Sales, Input Supply, Input Supply, Input Supply
7	Bathinda	Behman Diwana	02-25-2016	VPO Behman Diwana	9417093961	Raw Milk, Dairy	Procurement, Procurement

8	Bathinda	Burj Mehma	02-25-2016	VPO Burj Mehma	9463519997	Raw Milk, Dairy	Procurement
9	Faridkot	Sarawan Women	22/03/2016	W/o Harvinder Singh, VPO Sarawan, Distt. Faridkot	95017-07983	Milk	Procurement
10	Faridkot	Matta Women	22/03/2016	W/o Harvinder Singh, VPO Matta, Distt. Faridkot	98765-51309	Milk	Procurement
11	Fatehgarh Sahib	Khamano Farmers Producer Company Limited (KFPCL)	03-23-2016	Village: Kotla Badla, Khamano, Fatehgarh Sahib-141411	95928-86364	Vegetables, Dairy	Aggregation and Marketing
12	Fatehgarh Sahib	Bhamarsi Farmers Producer Company Limited (BFPCL)	05/05/2016	Vill. Bhamarsi Buland, Tehsil & Distt. Fatehgarh Sahib-140405	91150-23524	Vegetables, Dairy	Aggregation and Marketing
13	Fatehgarh Sahib	Akal Farmer Producer Company Limited	24/01/2017	Vill Nonowal, Dist Fatehgarh Sahib	9915310703	Vegetables, Fruits	Value Addition
14	Fatehgarh Sahib	Dholewal Grain Producer company Ltd.	Dt- 13-05-2015	Vill. Dholewal Tehsil Khamano Distt. F.G Sahib	9478619243	Maize, Paddy, Wheat, Foodgrains	Procurement
15	Fatehgarh Sahib	Fatehgarh Sahib Vegetable Producer Company	Dt- 20-07-2014	Vill. Marwan Tehsil Khamano Distt. F.G Sahib	8146795365	Vegetables, Tomato	Marketing
16	Fazilka	CHAK SARIAN	28/03/2016	CHAK SARIAN	9781617338	AGRICULTURE,Dairy,DAIRY	Procurement
17	Fazilka	ROORIAN WALI	31/03/2016	ROORIAN WALI	9463233934	AGRICULTURE,Dairy,DAIRY	Procurement

18	Fazilka	SHER MUHAMAD	28/03/2016	SHER MUHAMAD	8872499359	AGRICULTURE,Dairy,DAIRY	Procurement
19	Firozpur	WARA WARIAM	22/03/2016	WARA WARIAM	9465515781	AGRICULTURE,Dairy,DAIRY	Procurement
20	Firozpur	HASAND HOT	29/03/2016	HASAND HOT	9023041278	AGRICULTURE,Dairy,DAIRY	Procurement
21	Gurdaspur	Farmer's Producer Organisation Dera Baba Nanak	3-31-2016		50000	Aggregation,Vegetables,wholesale,Production,Food Grains,marketing of vegetables in retails,Apiculture	Aggregation
22	Gurdaspur	Qaddian Farmer Producer Organisation	03-31-2016	Village Kahlwan, P.O. Qadian, District Gurdaspur	9876127905	Aggregation,Vegetables,wholesale,Production,Food Grains,marketing of vegetables in retails,Apiculture	Aggregation
23	Gurdaspur	Sallopur Foods	02/05/2015	Vill. Sallopur, Tehsil & Distt. Gurdaspur	9463226244	Turmeric,Honey,Others,Spices,Pulses	Marketing
24	Gurdaspur	Shubhkarman	Dt-05-11-2015	Vill. Taragarh, Tehsil & Distt. Gurdaspur	9464755179	Others,Earth worms,Vermi Compost,vermi wash	Aggregation
25	Gurdaspur	Young Innovative	Dt-20-03-2015	Vill. Chorh Sidhwan, Tehsil & Distt. Gurdaspur	9464496335	Others,Dairy,Milk Products,Milk	Aggregation
26	Gurdaspur	CHINNA BET (W)	18/02/2016	VILL. CHINNA BET P.O DINANAGAR DIST. GURDASPUR	8427030988	NIL,Dairy	Procurement
27	Gurdaspur	DALAM (W)	17/02/2016	VILL. DALAM P.O DALAM DIST. GURDASPUR	8437993585	NIL,Dairy	Procurement

28	Gurdaspur	CHAN CHAK (W)	18/02/2016	VILL. CHAN CHAK P.O. CHOR SIDHWAN DIST. GURDASPUR	9465724509	NIL,Dairy	Procurement
29	Gurdaspur	THIKKRIWAL (W)	18/02/2016	VILL. THIKRIWAL P.O QADIAN DIST. GURDASPUR	9876734533	Milk	Procurement
30	Gurdaspur	DULT (W)	18/02/2016	VILL. DULT PO. CHIRA DIST. GURDASPUR	9872771073	NIL,Dairy	Procurement
31	Hoshiarpur	RD FPO	Dt-28-03-2016	Vill. Singriwala Tehsil & Distt. Hoshiarpur	7696212526	Goatery,Sale of Milk,others,Meat	Marketing, Marketing
32	Hoshiarpur	Sunrise FPO	Dt-28-03-2016	Vill. Ramgarh Sikri Tehsil Mukrian Distt. Hoshiarpur	9463945467	Goatery,Sale of Milk,others,Meat	Marketing
33	Hoshiarpur	Ravidas Nagar	02-26-2016	VPO Ravidass Nagar Dist Hoshiarpur	Nil	NIL,Dairy	Procurement
34	Hoshiarpur	Naru Nangal Kila	02-26-2016	Vill. Naru Nangal Kila, Dist. Hoshiarpur	97816-71532	NIL,Dairy	Procurement
35	Hoshiarpur	Punjan	02-26-2016	VPO Punjan Dist Hoshiarpur	Nil	NIL,Dairy	Procurement
36	Hoshiarpur	New Hariana	02-26-2016	VPO Hariana, Dist.	Nil	NIL,Dairy	Procurement

				Hoshiarpur			
37	Jalandhar	Agaaz Farmer Producer Company Limited	24/03/2017	B1 62, Anand Nagar, Jalandhar	9803137136	Potato,Potato Seed,Vegetables	Marketing
38	Jalandhar	The Bhogpur FPO	Dt-05-12-2014	Vill. Chark-Ke, Tehsil & Distt. Jalandhar	9417131548	Organic,Jaggery,Wheat,Foodgrains,Rice	Processing
39	Jalandhar	Doaba Honey FPO	Dt- 14-10-2015	Vill. Kadiana Tehsil & Distt. Jalandhar	9815405407	Honey,Apiculture,others	Aggregation
40	Kapurthala	Farmer Producer Association, Dhilwan	03-31-2016	VPO Miani Bakarpur Dhilwa, Kapurthal, Punjab.	8568914354	Vegetables,Fruits	Aggregation and Marketing
41	Kapurthala	Farmer's Producer Organisation Kapurthala	06-25-2015	V.P.O. Durgapur, District Kapurthala	9414877418	Aggregation,Vegetables,wholesale,Production,Food Grains,marketing of vegetables in retails,Apiculture	Aggregation
42	Kapurthala	Sultanpur Lodhi Fruit & Vegetable Co-operatvive Society	03-31-2016	Village Meera, P.O. Sultanpur Lodhi, District Kapurthala	9815815003	Aggregation,Vegetables,wholesale,Production,Food Grains,marketing of vegetables in retails,Apiculture	Aggregation
43	Ludhiana	Farmway Farmer Producer Company Limited	14/03/2017	Village Kotla, Dist Ludhiana	9915632577	Others,Piggery,Processed Food	Processing
44	Ludhiana	khushaal honey and diary producers association	01/04/2016	boparai khurd	9815608432	Dairy,Apiculture	Aggregation and Marketing
45	Ludhiana	Global SHG's Farmers' Producer	03-30-2015	Dashmesh Nagar, Ayali	9988008003	Green Peas,Chilli,Tomato,Product Basket	Processing

		Organisation		Khurd, Ludhiana			
46	Ludhiana	khushaal seed producers association	01/04/2016	jalaldiwal	9815608432	Seed	Aggregation and Marketing
47	Ludhiana	khushaal agri producers association	1-4-2016	shahbazpura	8360756586	Vegetables,Foodgrains	Aggregation and Marketing
48	Mansa	Reond Kalan	02-24-2016	VPO Reond Kalan	9914567785	Raw Milk,Dairy	Procurement
49	Mansa	Gandu Kalan	02-24-2016	VPO Gandu Kalan	9814507831	Raw Milk,Dairy	Procurement
50	Mansa	Talabwala	02-24-2016	VPO Talabwala	9914745071	Raw Milk,Dairy	Procurement
51	Moga	Lande Ke Women	22/03/2016	W/o Namtej Singh, VPO Lande Ke, Distt. Moga	84377-03615	Milk	Procurement
52	Pathankot	Bamial Fruit and Vegetables co-operative Society	04/10/2016	V.P.O. Bamial	9465851971	Aggregation,Others,Vegetables,wholesale,Production,Food Grains,marketing of vegetables in retails	Aggregation
53	Pathankot	Farmer's Producer Organisation Narot	03-31-2016		9530921452	Aggregation,Vegetables,wholesale,Production,Food Grains,marketing of vegetables in retails,Apiculture	Aggregation
54	Pathankot	Sujanpur Fruit & Vegetable Co-operatvive Society	04-25-2016	Village Sherpur, P.O. Sujanpur, District Pathankot	Surekha Devi	Aggregation,Others,Vegetables,wholesale,Production,Food Grains,marketing of vegetables in retails	Aggregation
55	Patiala	Nojvan Farmer Producer Company Limited	19/01/2017	Ghanour, Dist Patiala	9417001804	Honey,Apiculture,Pollan	Processing

56	Patiala	Freshcrop Farmer Producer Company Limited	08/08/2016	Sooch Farm, Vill Pahadipur, Patiala	9463775000	Vegetables,Fresh Vegetables,Onion	Aggregation
57	Patiala	Punjab Organic Fruit and Veg Farmer Producer Company Limited	21/02/2017	75, Ward No 10, Ghagga, Patiala	8146000494	Vegetables,Fruit,Organic Vegetables,Tomato	Marketing
58	Rupnagar	Rupnagar Producer Company Limited	04/03/2013	Village & Post Office Lodhi majra, District - Ropar 140113 (Punjab)	8107592226	fertilizers,pesticides,seeds,insecticides, Agro waste,Biomass	Input Sales, Others, Aggregation, Procurement, Procurement
59	Rupnagar	Kiratpur sahib Kisan Mitra Agri Producer Company Limited	21STMay 2016	vill-Majher , P/o massewal The-Anandpur sahib ,Ropar , Punjab	8872795954	Wheat,Apiculture	Input Sales
60	Sahibzada Ajit Singh Nagar	Agrizone Farmer Producer Company Limited FPO	17/10/2018	SAS Nagar	9357052828		
61	Sangrur	Green Focus Farmer Producer Company Limited	05/12/2016	Bhawanigarh, Dist Sangrur	9888399412	Vegetables,Onion Garlic Paste,Onion,Food Products	Marketing
62	Sangrur	Changal Farmers Producer Company Limited	11/04/2019	Changal	8283886801		
63	Sangrur	Khadial Farmers Producer Company Limited		Khadial	9815654236		

64	Sri Muktsar Sahib	Saanjh Farmer Producer Company Limited	08/02/2017	Ward No 21, Steet 10, Malout, MSS	8699555651	Others, Food Products, Grocery products, Foodgrains	Marketing
65	Sri Muktsar Sahib	Dani Barki Women	22/03/2016	W/o Navdeep Singh, VPO Dani Barki, Distt. Shri Muktar Sahib	98885-01408	Milk	Procurement
66	Sri Muktsar Sahib	Seer Wali Women	28/03/2016	W/o Parmjit Singh, VPO Seer Wali, Distt. Shri Muktsar Sahib	84270-49403	Milk	Procurement
67	Tarn Taran	Bhikiwind Fruit and Vegetables co-operative Society Ltd	04-25-2016	Village Ami Shah P.O. Khalra	8872388742	Vegetables	Aggregation
68	Tarn Taran	Majha Seed Producer Association	10-16-2011		9356552657	Aggregation, Others, Vegetables, wholesale,Production, Food Grains,marketing of vegetables in retails	Aggregation
69	Tarn Taran	Progressive FPO	Dt- 30-03-2016	Vill. Nagoke Tehsil Khadoor Sahib Distt. Tarn Taran	9781639100	Cash Crop, Others, cash crop,Vegetables,1. Banana 2. Ginger 3. Vegetables, Vegetables,Green Peas,Chilli,Tomato	Others, Marketing
70	Tarn Taran	Farmer Producer Organization	Dt-15-09-2015	Vill. Darapur Tehsil Khadoor Sahib Distt. Tarn Taran	9779367090	Vegetables,Green Peas,Tomato	Marketing

A.6. List of identified SHGs

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
1	Bathinda	Bathinda	Kalpna Chawla Ajivika Mehla Gram Sangathan	Sukhi Store	Charanjit Kaur	Others (Food Processing)	Vpo Behman Diwana	9988826721
2	Bathinda	Bathinda	Mahila Shakti Ajivika Mehla Gram Organization	Satguru Pickle	Sarabjit Kaur	Others (Food Processing)	Vpo W/O Angrej Singh Bulladewala	9478205117
3	Bathinda	Bathinda	Mahila Shakti Ajivika Mehla Gram Organization	Guru Teg Pickle	Baljeet Kaur	Others (Food Processing)	Vpo Bulladewala	6239229726
4	Bathinda	Bathinda	Mahila Shakti Ajivika Mehla Gram Organization	Mahila Jagriti Pickle	Baljeet Kaur	Others (Food Processing)	Vpo Bulladewala	7814645034
5	Bathinda	Bathinda	Mahila Shakt	Rural Mart	Chhinder Kaur	Others (Food	Vpo Bulladewala	6239229726

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			i Ajivika Mehla Gram Organization			Processing)		
6	Bathinda	Bathinda	Mahila Shakti Ajivika Mehla Gram Organization	Mahila Jagriti Pickle	Baljeet Kaur	Others (Food Processing)	Vpo Bulladewala	7814645034
7	Bathinda	Bathinda	Mahila Shakti Ajivika Mehla Gram Organization	Satguru Pickle	Sarabjit Kaur	Others (Food Processing)	Vpo Bulladewala	9478205117
8	Bathinda	Bhagta Bhaika	Lok Bhalai Mehla Gram Sangathan	Roshni Shg	Charanjit Kaur	Dairy Products	Rajgarh	8437571427
9	Bathinda	Bhagta Bhaika	Lok Bhalai Mehla Gram Sangathan	Dashmesh Pita Shg	Kamaljeet Kaur	Dairy Products	Rajgarh	9464126281
10	Bathinda	Bhagta Bhaika	Lok Bhalai Mehla Gram	Roshni Shg	Veerpal Kaur	Dairy Products	Rajgarh	9463623853

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Sangathan					
11	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Baba Dhera Wala Shg	Sumandeep Kaur	Others (Food Processing)	Bhodipur	8284859903
12	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Jai Shri Ram Shg	Gurmel Kaur	Others (Food Processing)	Bhodipur	9465314428
13	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Baba Dhera Wala	Navdeep Kaur	Others (Food Processing)	Bhodipura	9592026942
14	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Beekeeping	Swaranjit Kaur	Others (Food Processing)	Bhodipur	9876308668
15	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Baba Farid Shg	Noordeep Kaur	Dairy Products	Dyalpura Bhai Ka	6283695646
16	Bathinda	Bhagta Bhaika	Nari Shakti Aajee	Khushi Shg	Rani Kaur	Dairy Products	Rajgarh	6284662655

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			vika Cluster Level Federation					
17	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Shri Guru Nanak Dev Ji Shg	Parmjit Kaur	Others (Food Processing)	Bhodipura	9876280213
18	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Sajri Saver Shg	Lakhwinder Kaur	Dairy Products	Rajgarh	9464709812
19	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Suman Bakree	Sumandeep Kaur	Grain Processing	Aklia Jalal	9464458025
20	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Baba Budha Shg	Veerpal Kaur	Others (Food Processing)	Bhodipura	7626856063
21	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Jai Shri Ram	Tipinder Kaur	Others (Food Processing)	Bhodipura	9463016668

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
22	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Zafarnama Shg	Shinder Pal Kaur	Grain Processing	Dialpura Bhaika	9876673828
23	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Ekamkar	Jasvir Kaur	Others (Food Processing)	Dyalpura Bhaika	9478500065
24	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Ekamkar	Veerpal Kaur	Others (Food Processing)	Dyalpura Bhaika	7814598679
25	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Ekamkar	Sarabjit Kaur	Others (Food Processing)	Dyalpura Bhaika	7626810014
26	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Ekamkar	Paramjit Kaur	Others (Food Processing)	Dyalpura Bhaika	9876333636
27	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Clust	Umeed	Ravinder Kaur	Others (Food Processing)	Dyalpura Bhai Ka	9841881632

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			er Level Federation					
28	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Jai Shri Ram Shg	Veerpal Kaur	Others (Food Processing)	Bhodipura	9876868389
29	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Manjit Kaber	Manjit Kaur	Grain Processing	Aklia Jalal	6284536963
30	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Paramjit Bakers	Paramjeet Kaur	Grain Processing	Aklia Jalal	9803768030
31	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Rani Bakers	Rani Kaur	Grain Processing	Aklia Jalal	8837675024
32	Bathinda	Bhagta Bhaika	Nari Shakti Aajeevika Cluster Level Federation	Sukhwinder Baker	Sukhvinder Kaur	Grain Processing	Aklia Jalal	9041361164

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
33	Bathinda	Goniana	Ekta Aajeevika Mahila Gram Sangathan	Gurnoor Pickle	Rajni Bala	Others (Food Processing)	Sivian Buladewala Road Vill Sivian Distt Bathinda	9814914407
34	Bathinda	Goniana	Ekta Aajeevika Mahila Gram Sangathan	Gurnoor Pickel	Rajni Bala	Others (Food Processing)	Sivian Buladewala Road Sivian	9814914407
35	Bathinda	Goniana	Nari Shakti Aajeevika Mahila Gram Sangathan	Jashan Bhandar Store	Baljinder Kaur	Others (Food Processing)	Vill Sivian District Bathinda	7814778594
36	Bathinda	Goniana	Nari Shakti Aajeevika Mahila Gram Sangathan	Jashan Bhandar Store	Baljinder Kaur	Others (Food Processing)	Village Sivian Distt Bathinda	7814778594
37	Bathinda	Maur	Azd Aajeevika Mahila Gram Sangathan	Govind Dairy	Rajveer Kaur	Dairy Products	Village Mansa Kalan Distt Bathinda	9780572404
38	Bathinda	Maur	Azd Aajeevika Mahila Gram Sangathan	Govind Dairy	Rajveer Kaur	Dairy Products	Village Mansa Kalan Distt Bathinda	9780572404
39	Bathinda	Maur	Azd Aajeevika Mahil	Harman Flour Mill	Charnjeet Kaur	Grain Processing	Village Mansa Kalan Distt Bathinda	9780572404

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			a Gram Sangathan					
40	Bathinda	Maur	Azd Aajeevika Mahila Gram Sangathan	Harman Flour Mill	Charnjeet Kaur	Grain Processing	Village Mansa Kalan Distt Bathinda	9780572404
41	Bathinda	Maur	Saanjh Aajeevika Mahila Gram Sangthan	Anmol Milk Bar	Sukhjinder Kaur	Dairy Products	Near Dharmshala Village Yatri Distt Bathinda	6239403537
42	Bathinda	Maur	Saanjh Aajeevika Mahila Gram Sangthan	Kirat Pickles	Swaran Kaur	Others (Food Processing)	Village Yatri Distt Bathinda	9876862442
43	Bathinda	Maur	Saanjh Aajeevika Mahila Gram Sangthan	Anmol Milk Bar	Sukhjinder Kaur	Dairy Products	Near Dharmshala Village Yatri Distt Bathinda	6239403537
44	Bathinda	Phul	Bibi Paaro Aajeevika Cluster Federation	Ajjevika Juice	Meena Kaur	Fruits Processing	Harnam Singh Wala	9501428140
45	Bathinda	Phul	Bibi Paaro Aajeevika Cluster Federation	Aajivika Pickle	Sukhpal Kaur	Vegetable Processing	Gurusar Mehraj	9780594704

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
46	Bathinda	Phul	Bibi Paaro Aajeevika Cluster Federation	Saflata Pickle	Harmander Kaur	Vegetable Processing	Harnam Singh Wala	7814556928
47	Bathinda	Phul	Bibi Paaro Aajeevika Cluster Federation	Mata Gujree Shg	Gurmeet Kaur	Vegetable Processing	Gurusar Mehraj	9814273370
48	Bathinda	Phul	Bibi Paaro Aajeevika Cluster Federation	Mata Sundri Shg	Sibaljit Kaur	Vegetable Processing	Gurusar Mehraj	9464825018
49	Bathinda	Phul	Bibi Paaro Aajeevika Cluster Federation	Mai Bhago Shg	Ramandeep Kaur	Vegetable Processing	Gurusar Mehraj	7889146038
50	Bathinda	Phul	Bibi Paaro Aajeevika Cluster Federation	Mai Bhago Shg	Sukhpal Kaur	Vegetable Processing	Gurusar Mehraj	9780594704
51	Bathinda	Phul	Bibi Paaro Aajeevika Cluster Federation	Guru Arjun Dev Ji	Veerpal Kaur	Vegetable Processing	Dyalpura Bhai Ka	6280523765
52	Bathinda	Phul	Nari Shakti Mahla Gram Sangthan	Ajeevika Vegetables	Simarjit Kaur	Vegetable Processing	Burj Gill	7589572441

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
53	Bathinda	Rampura	Bhullar Ajevika Gram Santhan	Sundri Pickle	Paramjit Kaur	Others (Food Processing)	Vpo Kotra Kora	8837850581
54	Bathinda	Rampura	Ekam Ajeevika Mahila Gram Sangthan	Jashan Bee Keeping	Amritpal Kaur	Others (Food Processing)	Vpo Mandi Khurd	9465272308
55	Bathinda	Rampura	Fateh Mahila Gram Sangathan	Jhansi Food Product	Gurmit Kaur	Others (Food Processing)	Vpo Buggran	9464934782
56	Bathinda	Rampura	My Bhago Ajivika Gram Sanghatan	Sevian Food Product	Karamjeet Kaur	Others (Food Processing)	Vpo Jhanduke	9464131783
57	Bathinda	Rampura	Shaurya Mahila Gram Sangathan	Nanak Pickle	Rupinder Kaur	Others (Food Processing)	Vpo Gill Kalan	8837850581
58	Bathinda	Rampura	Shaurya Mahila Gram Sangathan	Miri Piri	Kamaljit Kaur	Others (Food Processing)	Vpo Gill Kalan	9814429224
59	Bathinda	Rampura	Shaurya Mahila Gram Sangathan	Miri Piri Food	Kamaljit Kaur	Others (Food Processing)	Vpo Gill Kalan	9814429224
60	Bathinda	Sangat	Sangat Aajeevika Cluster	Mani Bakery	Meenu Rani	Others (Food Processing)	Village Chakk Attar Singh Wala Distt Bathinda	7508865544

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Level Fedration					
61	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Ekam Bakery	Charnjeet Kaur	Others (Food Processing)	Village Pathrala Distt Bathinda	9888516487
62	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Jot Bakery	Manjeet Kaur	Others (Food Processing)	Village Chakk Attar Singh Wala Distt Bathinda	9781304637
63	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Ashoka Bakery	Angrej Kaur	Others (Food Processing)	Village Pathrala Distt Bathinda	8146938288
64	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Sukhmani Bakery	Manjeet Kaur	Others (Food Processing)	Village Gurusar Shenewala Distt Bathinda	9988662203
65	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Kirat Bakery	Sukhdeep Kaur	Others (Food Processing)	Village Chakk Attar Singh Wala Distt Bathinda	7696772435
66	Bathinda	Sangat	Sangat Aajeevika Cluster Level	Shaan Bakery	Baljinder Kaur	Others (Food Processing)	Village Ghudda Distt Bathinda	9501333437

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Fedration					
67	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Baba Bakery	Baljinder Kaur	Others (Food Processing)	Village Ghudda Distt Bathinda	7508124202
68	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Anil Bakery	Rajveer Kaur	Others (Food Processing)	Village Chakk Attar Singh Wala Distt Bathinda	752886474 6
69	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Jiwan Bakery	Charanjeet Kaur	Others (Food Processing)	Village Chakk Attar Singh Wala Distt Bathinda	758957190 3
70	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Ganga Bakery	Baljeet Kaur	Others (Food Processing)	Village Ghudda Distt Bathinda	700997182 6
71	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Star Bakery	Neetu Kaur	Others (Food Processing)	Village Pathrala Dist Bathinda	964654534 7
72	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Basant Bakery	Sarbjeet Kaur	Others (Food Processing)	Village Ghudda Distt Bathinda	842718054 0

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
73	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Manjeet Bakery	Usha Rani	Others (Food Processing)	Village Ghudda Distt Bathinda	9592465436
74	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Anmol	Neena Rani	Others (Food Processing)	Village Chakk Attar Singh Wala Distt Bathinda	9878710658
75	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Shivam Bakery	Binder Kaur	Others (Food Processing)	Village Pathrala Distt Bathinda	6284836506
76	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Sukh Bakery	Sukhjeet Kaur	Others (Food Processing)	Village Ghudda Distt Bathinda	9501994228
77	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Vishal Bakery	Harjeet Kaur	Others (Food Processing)	Village Ghudda Distt Bathinda	9417344208
78	Bathinda	Sangat	Sangat Aajeevika Cluster Level Fedration	Uddam Bakery	Sukhjeet Kaur	Others (Food Processing)	Village Ghudda Distt Bathinda	9646358287

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
79	Bathinda	Talwandi Sabo	Beti Bachao Aajivika Mahila Gram Sangathan	Prabh Aajeevika Self Help Group	Ranjit Kaur	Others (Food Processing)	Vpo Bangi Deepa Singh	9501523224
80	Bathinda	Talwandi Sabo	Beti Bachao Aajivika Mahila Gram Sangathan	Prabh Aajeevika Self Help Group	Kawalpreet Kaur	Others (Food Processing)	Vpo Bangi Deepa Singh	9464901123
81	Bathinda	Talwandi Sabo	Beti Bachao Aajivika Mahila Gram Sangathan	Prabh Aajeevika Self Help Group	Daljit Kaur	Others (Food Processing)	Vpo Bangi Deepa Singh	9463317556
82	Bathinda	Talwandi Sabo	Beti Bachao Aajivika Mahila Gram Sangathan	Prabh Aajeevika Self Help Group	Kawalpreet Kaur	Others (Food Processing)	Vpo Bangi Deepa Singh	9501523224
83	Bathinda	Talwandi Sabo	Kiran Aajeevika Mahila Gram Sangthan	Baba Saheed Lal Singh Self Help Group	Manpreet Kaur	Grain Processing	V P O Laleana	9888066386
84	Bathinda	Talwandi Sabo	Kiran Aajeevika Mahila Gram Sangthan	Sukhjinder Kaur	Sukhjinder Kaur	Others (Food Processing)	Vpo Laleanna ,Talwandi Sabo	9888066386

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
85	Bathinda	Talwandi Sabo	Nari Shakti Mahila Gram Sangthan	Jaswinder Kaur	Jaswinder Kaur	Others (Food Processing)	Vpo Bhagiwander	7508686452
86	Bathinda	Talwandi Sabo	Nari Shakti Mahila Gram Sangthan	Khushpreet Aajeevika Self Help Group	Jaswinder Kaur	Grain Processing	V P O Baghiwander	9781447827
87	Bathinda	Talwandi Sabo	Navi Soch Aajeevika Mahila Gram Sangthan	Saheed Self Help Group	Jaspreet Kaur	Dairy Products	V P O Malkana	9780243475
88	Bathinda	Talwandi Sabo	Navi Soch Aajeevika Mahila Gram Sangthan	Baba Saheed Self Help Group	Jaspreet Kaur	Dairy Products	V P O Malkana	7009402144
89	Bathinda	Talwandi Sabo	Navi Soch Aajeevika Mahila Gram Sangthan	Sehaj Shg	Charanjeet Kaur	Others (Food Processing)	V P O Malkana	9914755912
90	Bathinda	Talwandi Sabo	Navi Soch Aajeevika Mahila Gram Sangthan	Sehaj Self Help Goup	Charanjeet Kaur	Others (Food Processing)	V P O Malkana	9914755912
91	Bathinda	Talwandi Sabo	Sajri Saver Aajeevika	Shri Bala Aajeevikas Self Help Group	Kuldeep Kaur	Others (Food Processing)	V P O Bagha	7696956908

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Mahela Gram Sanghatn					
92	Bathinda	Talwandi Sabo	Sajri Saver Aajeevika Mahela Gram Sanghatn	Kuldeep Kaur	Kuldeep Kaur	Others (Food Processing)	Vpo Bagha ,Talwandi Sabo	7696956908
93	Firozepur	Firozpur	Chamkor C L F	Krishna	Karishana Rani	Others (Food Processing)	Village Habib Ke	9988562357
94	Firozepur	Ghall Khurd	Roshni Mahila	Manjeet Kaur	Manjeet Kaur	Others (Food Processing)	Village Macchi Bugra	9914493970
95	Firozepur	Makhu	Mata Bhago Mahila Clf	Narhi Shakti	Balvir Kaur	Others (Food Processing)	Village Kahdoor	9653448094
96	Gurdaspur	Batala	Jan Shakti Cluster Level Federation	Pallvi	Pallvi	Vegetable Processing	Village Akkarpura	9417677538
97	Gurdaspur	Batala	Jan Shakti Cluster Level Federation	Daljit Kaur	Daljit Kaur	Dairy Products	Village Taragarh	9914042950
98	Gurdaspur	Batala	Jan Shakti Cluster Level Federation	Ready To Eat Kulcha Nan	Baljit Kaur	Others (Food Processing)	Village Joura Singha	7087198446
99	Gurdaspur	Batala	Jan Shakti Cluster	Baljlit Kaur	Baljit Kaur	Vegetable Processing	Village Taragarh	8437068113

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Level Federation					
100	Gurdaspur	Batala	Jan Shakti Cluster Level Federation	Sarbjit Kaur	Sarbjit Kaur	Others (Food Processing)	Village Balewal	8146392745
101	Gurdaspur	Batala	Jan Shakti Cluster Level Federation	Ranjit Kaur	Ranjit Kaur	Vegetable Processing	Village Balewal	8284056351
102	Gurdaspur	Dera Baba Nanak	Dhesian Aajeevika Mahila Gram Sangathan	Dairy Products	Amarjit Kaur	Dairy Products	Dhesian	8725931681
103	Gurdaspur	Dera Baba Nanak	Dhesian Aajeevika Mahila Gram Sangathan	Marmalade	Manjeet Kaur	Others (Food Processing)	Dhesian	8725931681
104	Gurdaspur	Dera Baba Nanak	Nari Shakti Mahila Gram Sangathan	Jaggery Products	Hardeep Kaur	Others (Food Processing)	Khalilpur	6284431248
105	Gurdaspur	Dera Baba Nanak	Noor Aajeevika Mahila Gram Sangthan	Turmeric Products	Mandeep Kaur	Others (Food Processing)	Khawaja Wardak	9877620247
106	Gurdaspur	Dera Baba Nanak	Noor Aajeevika	Turmeric Products	Mandeep Kaur	Others (Food	Khawajawardak	9877620247

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Mahila Gram Sangthan			Processing)		
107	Gurdaspur	Dera Baba Nanak	Noor Aajeevika Mahila Gram Sangthan	Termeric Products	Charanjeet Kaur	Others (Food Processing)	Khawaza Wardak	9682160550
108	Gurdaspur	Dera Baba Nanak	Saras Aajeevika Mahila Gram Sangathan	Turmeric Products	Davinder Kaur	Others (Food Processing)	Nabi Nagar	8544812293
109	Gurdaspur	Dera Baba Nanak	Saras Aajeevika Mahila Gram Sangathan	Turmaric Products	Davinder Kaur	Others (Food Processing)	Nabi Nagar	8544812293
110	Gurdaspur	Dera Baba Nanak	Shri Guru Nanak Dev Ji Aajeevika Cluster Level Society	Termeric Products	Simranjeet Kaur	Others (Food Processing)	Rauwal	8968453281
111	Gurdaspur	Dera Baba Nanak	Shri Guru Nanak Dev Ji Aajeevika Cluster Level Society	Termuric Product	Simranjeet Kaur	Others (Food Processing)	Rauwal	8968453281

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
112	Gurdaspur	Dera Baba Nanak	Shri Guru Nanak Dev Ji Aajeevika Cluster Level Society	Jaggery Products	Nirmala	Others (Food Processing)	Gillanwali	623907308 6
113	Gurdaspur	Dera Baba Nanak	Shri Guru Nanak Dev Ji Aajeevika Cluster Level Society	Dairy Products	Rajbir Kaur	Dairy Products	Mamman	991459531 5
114	Gurdaspur	Dera Baba Nanak	Shri Guru Nanak Dev Ji Aajeevika Cluster Level Society	Pickle	Jiwan Jot	Others (Food Processing)	Dehar	991560753 8
115	Gurdaspur	Dera Baba Nanak	Shri Guru Nanak Dev Ji Aajeevika Cluster Level Society	Pickle	Mandeep Kaur	Others (Food Processing)	Mamman	950168947
116	Gurdaspur	Dhariwal	Jan Kalyan Cluster Level Fedrration	Bakery Product	Dalbir Kaur	Others (Food Processing)	Sohal	985571341 1

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
117	Gurdaspur	Dhariwal	Jan Kalyan Cluster Level Fedrration	Dairy	Sarabjeet Kaur	Dairy Products	Sohal	9517958363
118	Gurdaspur	Dhariwal	Jan Kalyan Cluster Level Fedrration	Pickle	Amarjit Kaur	Others (Food Processing)	Sohal	8054883233
119	Gurdaspur	Dhariwal	Mai Bhago Cluster Level Fedrration	Dairy Product	Balwinder Kaur	Dairy Products	Athwal	9855002707
120	Gurdaspur	Dhariwal	Mai Bhago Cluster Level Fedrration	Bakery Product	Daljit Kaur	Others (Food Processing)	Satkoha	8360978066
121	Gurdaspur	Dinanagar	Banthawal Mahila Gram Sangathan	Jaggery Products	Darshna Devi	Others (Food Processing)	Village Banthawala	8968784920
122	Gurdaspur	Dinanagar	Banthawal Mahila Gram Sangathan	Jaggery Product	Paramjit Kour	Others (Food Processing)	Village Banthawala	6284578076
123	Gurdaspur	Dinanagar	Banthawal Mahila Gram Sangathan	Jaggery Products	Paramjit Kour	Others (Food Processing)	Village Banthawala	6284578076

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
124	Gurdaspur	Dinanagar	Banthawal Mahila Gram Sangathan	Jaggery Products	Darshna Devi	Others (Food Processing)	Village Banthawala	8968784920
125	Gurdaspur	Fatehgarh Churian	Kranti Cluster Level Fedration	Dairy Products	Darshan Kaur	Dairy Products	Village. Thatha	9815744834
126	Gurdaspur	Fatehgarh Churian	Kranti Cluster Level Fedration	Pickle	Kawaljit Kaur	Fruits Processing	Village. Thatha	9876433575
127	Gurdaspur	Gurdaspur	Dharochak Mahila Gram Sangathan	Chanchal Devi	Chanchal Devi	Others (Food Processing)	Village Dharo Chak	9517086104
128	Gurdaspur	Gurdaspur	Dharochak Mahila Gram Sangathan	Asha Rani	Asha Rani	Vegetable Processing	Village Dharo Chak	9517086104
129	Gurdaspur	Gurdaspur	Kharal Mahila Gram Sangathan	Vegtable And Fruits	Davinder Pal Kaur	Vegetable Processing	Village Kharal Goraya	7340887435
130	Gurdaspur	Gurdaspur	Kharal Mahila Gram Sangathan	Dairy And Sugar Cane Product	Baljinder Kaur	Dairy Products	Village Khar	7340887435
131	Gurdaspur	Kahnuwan	Chardi Kala Mahila Gram Sagdhan	Spices And Its Products	Sukhwinder Kaur	Others (Food Processing)	Village Salopur	9463226244

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Aajeevika					
132	Gurdaspur	Kahnuwan	Chardi Kala Mahila Gram Sagdhan Aajeevika	Turmeric Power And Pickle	Gurdeep Kaur	Others (Food Processing)	Village Salopur	9592817210
133	Gurdaspur	Kahnuwan	Chardi Kala Mahila Gram Sagdhan Aajeevika	Spices And Its Products	Gurdeep Kaur	Others (Food Processing)	Village Salopur	9463226244
134	Gurdaspur	Kahnuwan	Chardi Kala Mahila Gram Sagdhan Aajeevika	Spices And Its Products	Amrik Kaur	Others (Food Processing)	Village Salopur	9463226244
135	Gurdaspur	Kahnuwan	Chardi Kala Mahila Gram Sagdhan Aajeevika	Spices And Its Products	Jasvir Kaur	Others (Food Processing)	Village Salopur	9463226244
136	Gurdaspur	Kahnuwan	Chardi Kala Mahila Gram Sagdhan Aajeevika	Spices And Its Products	Kawaljit Kaur	Others (Food Processing)	Village Salopur	9463226244
137	Gurdaspur	Kahnuwan	Chardi Kala Mahil	Spices And Its Products	Kulwinder Kaur	Others (Food Processing)	Village Salopur	9463226244

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			a Gram Sagdhan Aajeevika					
138	Gurdaspur	Kahnuwan	Chardi Kala Mahila Gram Sagdhan Aajeevika	Spices And Its Products	Mandeep Kaur	Others (Food Processing)	Village Salopur	9592817210
139	Gurdaspur	Kahnuwan	Chardi Kala Mahila Gram Sagdhan Aajeevika	Spices And Its Products	Nirmal Kaur	Others (Food Processing)	Village Salopur	9592817210
140	Gurdaspur	Kahnuwan	Chardi Kala Mahila Gram Sagdhan Aajeevika	Spices And Its Products	Ravinder Kaur	Others (Food Processing)	Village Salopur	9463226244
141	Gurdaspur	Kahnuwan	Chardi Kala Mahila Gram Sagdhan Aajeevika	Spices And Its Products	Mandeep Kaur	Others (Food Processing)	Village Salopur	9592817210
142	Gurdaspur	Kahnuwan	Chardi Kala Mahila Gram Sagdhan Aajeevika	Spices And Its Products	Ravinder Kaur	Others (Food Processing)	Village Salopur	9592817210

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
143	Gurdaspur	Kalanaur	Lakshmi Mahila Gram Sangathan	Jaggery Product	Ranbir Kaur	Others (Food Processing)	Village Lakhan Kalan,Block Kalanour	7837013842
144	Gurdaspur	Kalanaur	Ujala Cluster Level Federation Bhandal	Jaggery Product	Jasbeer Kaur	Others (Food Processing)	Village Ugru Khera,Block Kalanour	9914377840
145	Gurdaspur	Kalanaur	Ujala Cluster Level Federation Bhandal	Pickle Product	Kawaljit Kaur	Others (Food Processing)	Village Bhandal,Block Kalanour	7717571501
146	Gurdaspur	Kalanaur	Ujala Cluster Level Federation Bhandal	Meat Shop	Gagandeep Kaur	Others (Food Processing)	Village Bhandal Block Kalanour	8427559528
147	Gurdaspur	Kalanaur	Ujala Cluster Level Federation Bhandal	Jaggery Product	Sarbjit Kaur	Others (Food Processing)	Village Bhandal Block Kalanour	8196864262
148	Gurdaspur	Kalanaur	Ujala Cluster Level Federation Bhandal	Aatta Chaki	Kuldeep Kaur	Others (Food Processing)	Village Bhandal Block Kalanour	8264934100
149	Gurdaspur	Kalanaur	Ujala Cluster Level Federation Bhandal	Jaggery Product	Paramjit Kaur	Others (Food Processing)	Village Mustfapur,Block Kalanour	9417429375

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
150	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Manveer Pickles Shop	Amarjit Kaur	Others (Food Processing)	Village Samaon District Mansa	9915644584
151	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Nonu Pickles	Charnjeet Kaur	Others (Food Processing)	Village Samaon District Mansa	9056140594
152	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Pawandeep Bakeri Shop	Kiranpal Kaur	Others (Food Processing)	Village Hiro Kalan	8727931614
153	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Neeraj Dairy	Gurmit Begam	Dairy Products	Village Kotra Kalan	9780439664
154	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Arman Bakery	Beant Kaur	Others (Food Processing)	Village Alisher Khurd District Mansa	6239874151

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
155	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Goldy Dairy	Karamjit Kaur	Dairy Products	Village Bhupal Khurd	6280394641
156	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Palak Pickles	Karmjeet Kaur	Others (Food Processing)	Village Atla Khurd District Mansa	7652877589
157	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Aman Dairy	Harpreet Kaur	Dairy Products	Village Bhupal Kalan District Mansa	6284210623
158	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Nonu Pickles	Charnjeet Kaur	Others (Food Processing)	Village Samaon District Mansa	9056140594
159	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Sawaranjeet Dairy	Veerpal Kaur	Dairy Products	Village Bhupal Khurd District Mansa	9876228896

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
160	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Harman Dairy	Jasveer Kaur	Dairy Products	Village Matti District Mansa	7901977301
161	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Manveer Pickles	Amarjit Kaur	Others (Food Processing)	Village Samaon District Mansa	9915644584
162	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Palak Pickles And Chatni	Karmjeet Kaur	Others (Food Processing)	Village Atla Khurd District Mansa	7052877589
163	Mansa	Bhikhi	Kohinoor Aajeevika Mahila Cluster Level Fedration	Sukhman Dairy	Amarjit Kaur	Dairy Products	Village Kotra Kalan District Mansa	9780439664
164	Mansa	Bhikhi	Parkash Aajeevika Mehla Gram Sangathan	Gurjit Dairy	Sarbjeet Kaur	Dairy Products	Village Atla Kalan District Mansa	8968848845
165	Mansa	Jhunir	Mother Teres	Jot Pickles	Sandeep Kaur	Others (Food	Village Danewala District Mansa	7973008332

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			a Mahila Cluster Level Fedr			Processing)		
166	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Jaswinder Bakery	Jaswinder Kaur	Others (Food Processing)	Village Nandghar	9855060983
167	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Gurmal Pickel	Gurmail Kaur	Others (Food Processing)	Village Danewala	7986571080
168	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Mansoor Pickel	Jagdeep Kaur	Others (Food Processing)	Village Moffer	9814896409
169	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Guru Dairy	Sarabjit Kaur	Dairy Products	Village Danewala	9464951849
170	Mansa	Jhunir	Mother Teresa Mahila Cluster	Mansoor Pickel	Jagdeep Kaur	Others (Food Processing)	Village Moffer	9814896409

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Level Fedr					
171	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Gurmail Pickel	Gurmail Kaur	Others (Food Processing)	Village Danewala	7986571080
172	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Hasmukh Dairy	Amandeep Kaur	Dairy Products	Village Danewale	9465796522
173	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Jai Bheem Pickel	Gurdeep Kaur	Others (Food Processing)	Village Danewala	7986571080
174	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Binder Pickel	Binder Kaur	Others (Food Processing)	Village Danewala	9417331268
175	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Rama Parchoon Shop	Rama Oberoi	Others (Food Processing)	Village Danewala	9815334225
176	Mansa	Jhunir	Mother Teresa	Gurmail Pickel	Gurmail Kaur	Others (Food Processing)	Village Danewala	7986571080

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Mahila Cluster Level Fedr					
177	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Binder Pickel	Binder Kaur	Others (Food Processing)	Villge Danewala	9415394173
178	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Sukhpal Dairy	Sukhpal Kaur	Dairy Products	Village Danewala	8877544485
179	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Preet Pickel	Jaswinder Kaur	Others (Food Processing)	Village Danewala	9465788427
180	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Jot Pickel	Sandeep Kaur	Others (Food Processing)	Village Danewala	7973008332
181	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Kulwant Pickel	Kulwant Kaur	Others (Food Processing)	Villge Danewala	9876096432

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
182	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Mansoor Pickel	Jagdeep Kaur	Others (Food Processing)	Village Moffer	9814896409
183	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Harry Pickel	Amarjit Kaur	Others (Food Processing)	Villge Danewala	9872031485
184	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Lakhpreet Dairy	Lakhpreet Kaur	Dairy Products	Village Nandgarh	9815334225
185	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Jaswinder Dairy	Jaswinder Kaur	Dairy Products	Village Danaewala	6084030113
186	Mansa	Jhunir	Mother Teresa Mahila Cluster Level Fedr	Rama Dairy	Rama Oberoi	Dairy Products	Village Nandgarh	9815334225
187	Mansa	Jhunir	Mother Teresa Mahila	Guru Dairy	Sarabjit Kaur	Dairy Products	Village Danewala	9464951849

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Cluster Level Fedr					
188	Mansa	Mansa	Fateh Ajeevika Mehla Gram Sangathan	Gagan Pickles	Pramjit Kaur	Others (Food Processing)	Village Burj Dhillwan District Mansa	9914265078
189	Mansa	Mansa	Ravi Aajeevika Mahila Gram Sangthan	Harman Dairy	Manjit Kaur	Dairy Products	Village Nangal Kalan District Mansa	8968707252
190	Mansa	Mansa	Ravi Aajeevika Mahila Gram Sangthan	Sawarna Dairy	Malkit Kaur	Dairy Products	Village Nangal Kalan District Mansa	9779227677
191	Mansa	Mansa	Ravi Aajeevika Mahila Gram Sangthan	Paramdeep Dairy	Amandeep Kaur	Dairy Products	Village Nangal Kalan District Mansa	7740056962
192	Mansa	Sardulgarh	Baba Amar Singh Kirti Aajeevika Mahila Grame Sangthan	Raman Dairy	Ramanpreet Kaur	Dairy Products	Village Fatta Maloka District Mansa	7719578514
193	Mansa	Sardulgarh	Baba Amar Singh Kirti Aajeevika Mahila	Jaspreet Dairy	Jaspreet Kaur	Dairy Products	Village Fatta Maloka District Mansa	7719578514

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Grame Sangthan					
194	Pathankot	Dhar Kalan	Roshanminar Mehila Cluster Fedration	Harey Krishna Bakary	Sonika Devi	Others (Food Processing)	Village Kroli Block Dharkalan Pathankot	7527975010
195	Patiala	Bhuner Heri	Jag Bhala Aajeevika Mahila Gram Sangthan	Shukar Dateya Milk Dairy	Mamta Rani	Dairy Products	Vill-Udaipur Diwanwala, Block-Bhunerheri, Dist-Patiala	8708975212
196	Patiala	Ghanaur	Gurman Ajeevika Mehla Gram Sangathan	Sanjeevan Ajeevika Pickle	Sajeevan Kaur	Others (Food Processing)	Kheri Pandta Village P.O Ajrawar Dist Patiala	9417121089
197	Patiala	Ghanaur	Gurman Ajeevika Mehla Gram Sangathan	Gurman Ajeevika Pickle	Labh Kaur	Others (Food Processing)	Kheri Pandta Villlag Po Ajrawar Teh Raapura Ghanour Dist Patiala	9501898598
198	Patiala	Nabha	Kranti	Aajeevika	Surinder Kaur	Dairy Products	Village Nalas Khurd	8146200769
199	Patiala	Nabha	Shri Chubara Sahib Aajeevika Mahila Gram Sangathan	Shehnaz	Parveen	Others (Food Processing)	Village Mansurpur	9877002061

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
200	Patiala	Nabha	Shri Chubara Sahib Aajeevika Mahila Gram Sangathan	Navi Soch	Gurmeet Kaur	Others (Food Processing)	Village Mansurpur	9781258648
201	Patiala	Patiala	Bebe Nanki	Guru Ravidas Self Help Group	Sarabjeet Kaur	Grain Processing	Village Madomajra	7657826986
202	Patiala	Patiala	Bebe Nanki	Guru Ravidas Self Help Group	Sukhwinder Kaur	Others (Food Processing)	Village Madomajra	9779762285
203	Patiala	Patiala	Buland Mahila Gram Sangathan	Noor Self Help Grgroup	Mamta Rani	Dairy Products	Village Dhablan	9855011522
204	Patiala	Patiala	Milaap	Tamana Self Help Group	Raj Kumari	Others (Food Processing)	Village Kaller Bhaini	7986423956
205	Patiala	Patiala	Navi Sawer	Jyoti Self Help Group	Mandeep Kaur	Vegetable Processing	Village Bibipur	6239304431
206	Patiala	Patiala	Navi Sawer	Bani Self Help Group	Kamlesh Kaur	Dairy Products	Village Bibipur	7814822341
207	Patiala	Patiala	Navi Sawer	Khushi Self Help Group	Nasrin Begam	Others (Food Processing)	Village Bibipur	9417534171
208	Patiala	Patiala	Sehanshelta Mahila Gram Sangthan	Harman Self Help Group	Naseeb Kaur	Others (Food Processing)	Village Jahlan	8360537083
209	Patiala	Patiala	Sukhmani Village Organisation	Guru Kirpa Self Help Group	Narinder Kaur	Vegetable Processing	Village Kaliyan	7681958652

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
210	Patiala	Patiala	Sukhmani Village Organisation	Guru Kirpa Self Help Group	Sunita Rani	Vegetable Processing	Village Kaliyan	9814013461
211	Patiala	Patiala	Sukhmani Village Organisation	Noor Self Help Group	Karamjeet Kaur	Vegetable Processing	Village Kaliyan	9041404547
212	Patiala	Patran	Kalpana Saroj	Joginder Devi	Joginder Devi	Dairy Products	Vill. Karim Nagar , Tehsil Patran, Distt. Patiala	9874512034
213	Patiala	Patran	Kalpana Saroj	Manju Bala	Manju Bala	Others (Food Processing)	Vill. Tugo Patti Shutrana Tehsil Patran , Distt. Patiala	8146301247
214	Patiala	Patran	Kalpana Saroj	Akaljit Kaur	Akaljit Kaur	Dairy Products	Vill. Arno, Tehsil Patran, Distt. Patiala	9714812035
215	Patiala	Patran	Kalpana Saroj	Mukhtiaro Devi	Mukhtiaro Devi	Others (Food Processing)	Vill. Karim Nagar, Tehsil Patran, Distt. Patiala	9041536548
216	Patiala	Patran	Kalpana Saroj	Indra Devi	Indra Devi	Dairy Products	Vill. Karim Nagar , Tehsil Patran, Distt. Patiala	9915097736
217	Patiala	Patran	Kalpana Saroj	Anju Rani	Anju Rani	Dairy Products	Vill, Tugo Patti, Tehsil Patran , Distt. Patiala	8288844990
218	Patiala	Patran	Kalpana Saroj	Jeeto Devi	Jeeto Devi	Dairy Products	Vill. Karim Nagar, Tehsil Patran, Distt. Patiala	6280944612
219	Patiala	Patran	Kalpana Saroj	Paramjeet Kaur	Paramjeet Kaur	Dairy Products	Vill. Karim Nagar, Tehsil Patran, Distt. Patiala	9417094595
220	Patiala	Patran	Kalpana Saroj	Vina Devi	Vina Devi	Dairy Products	Vill. Arno, Tehsil Patran, Distt. Patiala	9914368171
221	Patiala	Patran	Kalpana Saroj	Joginder Kaur	Joginder Devi	Dairy Products	Vill.Karim Nagar Tehsiil Patran, Distt. Patiala	9874512034
222	Patiala	Patran	Kalpana Saroj	Indra Devi	Indra Devi	Dairy Products	Vill. Karim Nagar, Tehsil Patran, Distt Patiala	9915097736

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
223	Patiala	Patran	Nari Ekta Mahila Gram Sangthan	Surinder Kaur	Surinder Kaur	Others (Food Processing)	Vill. Brass, Tehsil Patran, Distt. Patiala	6283087897
224	Patiala	Patran	Navi Udan	Karamjeet Kaur	Karamjeet Kaur	Dairy Products	Vill. Tambuwla, Tehsil Patran, Distt. Patiala	7845120058
225	Patiala	Patran	Navi Udan	Kuldeep Kaur	Kuldeep Kaur	Vegetable Processing	Vill. Tambuwala, Tehsil Patran, Distt. Patiala	9780480338
226	Patiala	Patran	Navi Udan	Gurmit Kaur	Gurmit Kaur	Dairy Products	Vill. Tambuwala, Tehsil Patran, Distt. Patiala	9780480338
227	Patiala	Patran	Navi Udan	Binder Kaur	Binder Kaur	Dairy Products	Vill,Tambuwalam, Tehsil Patran, Distt. Patiala	9592262603
228	Patiala	Patran	Navi Udan	Harpreet Kaur	Harpreet Kaur	Others (Food Processing)	Vill. Tambuwala, Tehsil Patran, Distt. Patiala	9914951810
229	Patiala	Patran	Navi Udan	Sarabjeet Kaur	Sarabjeet Kaur	Dairy Products	Vill. Tambuwala, Tehsil Patran, Distt. Patiala	7814536982
230	Patiala	Patran	Navi Udan	Raj Kaur	Raj Kaur	Others (Food Processing)	Vill. Tambuwala, Tehsil Patran, Distt. Patiala	9814251422
231	Patiala	Patran	Navi Udan	Jaswant Kaur	Jaswant Kaur	Vegetable Processing	Vill. Tambuwala, Tehsil Patran, Distt. Patiala	8196832087
232	Patiala	Rajpura	Kranti	Kirat	Gurpreet Kaur	Others (Food Processing)	Village - Kotla	9465435860
233	Patiala	Rajpura	Kranti	Aajeevika	Jaspal Kaur	Dairy Products	Village Kotla	9814854308
234	Patiala	Rajpura	Kranti	Nobel Aajeevika	Charanjeet Kaur	Others (Food Processing)	Village Kotla	9855237111
235	Patiala	Rajpura	Kranti	Guru Arjun Dev Aajeevika	Sarabjeet Kaur	Dairy Products	Village Kotla	9417986684
236	Patiala	Rajpura	Kranti	Jot	Lilo Bai	Dairy Products	Village Nalas Khurd	9463424390
237	Patiala	Rajpura	Kranti	Satnam Aajeevika	Surinder Kaur	Dairy Products	Village Nalas Khurd	8146200769

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
238	Patiala	Rajpura	Kranti	Shakti Aajeevika	Lachami Bai	Dairy Products	Village Nalas Khurd	6284836758
239	Patiala	Rajpura	Kranti	Shakti	Rajwant Kaur	Dairy Products	Village Nalas Khurd	6283871194
240	Patiala	Rajpura	Kranti	Baba Fateh	Harjinder Kaur	Dairy Products	Village Kotla	8872212577
241	Patiala	Rajpura	Kranti	Mankirat	Charanjeet Kaur	Others (Food Processing)	Village- Kotla	9465435860
242	Patiala	Rajpura	Kranti	Satnam	Paramjeet Kaur	Dairy Products	Village Nalas Khurd	7973590678
243	Patiala	Rajpura	Kranti	Mata Sahib	Sukhdeep Kaur	Dairy Products	Village Kotla	6283264003
244	Patiala	Rajpura	Kranti	Preet	Karmjeet Kaur	Others (Food Processing)	Village Kotla	8427047186
245	Patiala	Rajpura	Sanjivani Aajeevika Clf	Unati	Anita Rani	Others (Food Processing)	Village Sarai Banjara	9888287101
246	Patiala	Rajpura	Sanjivani Aajeevika Clf	Aajeevika	Neelam Kaur	Dairy Products	Village Sarai Banjara	9888220477
247	Patiala	Rajpura	Sanjivani Aajeevika Clf	Shiv Shakti Aajeevika	Sona Devi	Others (Food Processing)	Village Sarai Banjara	7508041880
248	Patiala	Samana	Bani Aajeevika Mahila Gram Sangathan	Daljit Kaur	Baljit Kaur	Dairy Products	Vill, Mavi Kalan Teshil Samana Distt. Patiala	9501257696
249	Patiala	Samana	Bani Aajeevika Mahila Gram	Daljeet Kaur	Daljeet Kaur	Dairy Products	Vill, Mavi Kalan, Tehsiil Samana Distt, Patiala	6239139744

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			Sangathan					
250	Patiala	Samana	Barkat Mehila Gram Sangthan	Mahinder Kaur	Mahinder Kaur	Vegetable Processing	Vill. Gajewas, Tehsil Samana, Distt. Patiala	9878572576
251	Patiala	Samana	Barkat Mehila Gram Sangthan	Sandeep Kaur	Sandeep Kaur	Fruits Processing	Vill. Gajewas, Tehsil Samana , Distt. Patiala	7841501236
252	Patiala	Samana	Nayi Disha Aajeevika Mahila Gram Sangthan	Jasbir Kaur	Jasvir Kaur	Others (Food Processing)	Vill, Rajgarh,Teshil Samana, Distt. Patiala	8725899108
253	Patiala	Samana	Nayi Disha Aajeevika Mahila Gram Sangthan	Manpreet Kaur	Manpreet Kaur	Dairy Products	Vill. Rajgarh, Tehsil Samana, Distt. Patiala	8284981843
254	Patiala	Samana	Sehyog Aajeevika Mahila Gram Sangthan	Balwinder Kaur	Balwinder Kaur	Grain Processing	Vill. Gajipur, Tehsil Samana, Distt. Patiala	7717269485
255	Patiala	Samana	Sehyog Aajeevika Mahila Gram Sangthan	Binder Kaur	Binder Kaur	Dairy Products	Vill. Gajipur, Tehsil Samana, Distt. Patiala	7814376961

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
256	Patiala	Samana	Sehyog Aajeevika Mahila Gram Sangthan	Binder Kaur	Binder Kaur	Dairy Products	Vill. Gajipur, Tehsil Samana, Distt. Patiala	7652860339
257	Patiala	Samana	Umeed Aajeevika Mahila Gram Sangthan	Kuldeep Kaur	Kuldeep Kaur	Dairy Products	Vill. Dhanetha, Tehsil Samana, Distt. Patiala	9781918755
258	Patiala	Samana	Umeed Aajeevika Mahila Gram Sangthan	Kulwant Kaur	Kulwant Kaur	Dairy Products	Vill. Dhanetha , Tehsil Samana, Distt. Patiala	9877985147
259	Patiala	Samana	Umeed Aajeevika Mahila Gram Sangthan	Mandeep Kaur	Mandeep Kaur	Others (Food Processing)	Vill. Dhanetha , Tehsil Samana, Distt. Patiala	7652860333
260	Patiala	Samana	Umeed Aajeevika Mahila Gram Sangthan	Jasvir Kaur	Jasvir Kaur	Others (Food Processing)	Vill. Dhanetha, Tehsil Samana, Distt. Patiala	9814398277
261	Patiala	Samana	Umeed Aajeevika Mahila Gram Sangthan	Jaswant Kaur	Jaswant Kaur	Fruits Processing	Vill. Dhanetha, Tehsil, Distt. Patiala	8872995017

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
262	Patiala	Samana	Umeed Aajeevika Mahila Gram Sangthan	Jasbir Kaur	Jasbir Kaur	Fruits Processing	Vill. Dhanetha, Tehsil Samana, Distt. Patiala	9779851473
263	Patiala	Sanour	Sanjhi Chaan	Kawaljeet Kaur	Kawaljeet Kaur	Dairy Products	Village Khudda Block Sanour	7837451199
264	Patiala	Sanour	Sanjhi Chaan	Chardikala	Ranjit Kaur	Others (Food Processing)	Village Khudda	8725950120
265	Patiala	Sanour	Sanjhi Chaan	Guru Nanak Dev Ji	Paramjit Kaur	Others (Food Processing)	Village Khudda Block Sanour	8725950120
266	Patiala	Sanour	Sanjhi Chaan	Jagrity	Swarnjit Kaur	Others (Food Processing)	Village Bosar Kalan	9815743072
267	Patiala	Shambhu Kalan	Kranti	Radha Swami Aajeevika	Madhu Bala	Others (Food Processing)	Village Jansua	7814940516
268	Patiala	Shambhu Kalan	Navi Kiran Gram Sangathan	Charda Suraj	Bholi	Others (Food Processing)	Village Jakhran	9855266811
269	Sangrur	Andana	Mai Bhago Ji Aajeevika Mahila Block Sangthan	Shri Guru Teg Bahadar Ji Shg	Krishana Devi	Vegetable Processing	Vill. Makoror Sahib , Teh-Moonak , Distt.- Sangrur.	8054498080
270	Sangrur	Sangrur	Kalpana Chawla Mahila Gram Sanghthan	Jasvir Kaur	Jasvir Kaur	Others (Food Processing)	Gagarpur	9855253710

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
271	Sangrur	Sunam	Shaheed Udham Singh Mahila Block Sangthan	Sahjvir Kaur	Sahijvir Kaur	Vegetable Processing	Village Khadial	9478109460
272	Sangrur	Sunam	Shaheed Udham Singh Mahila Block Sangthan	Parmjit Kaur	Paramjeet Kaur	Others (Food Processing)	Village Chatha Nanhera	9517093286
273	Sangrur	Sunam	Shaheed Udham Singh Mahila Block Sangthan	Charanjit Kaur	Charanjit Kaur	Others (Food Processing)	Village Chatha Nanhera	9646413048
274	Sangrur	Sunam	Shaheed Udham Singh Mahila Block Sangthan	Kirat Self Help Group	Rajinder Kaur	Others (Food Processing)	Village Chatha Nanhera	9779786167
275	Sangrur	Sunam	Shaheed Udham Singh Mahila Block Sangthan	Manjit Kaur	Manjit Kaur	Others (Food Processing)	Village Chatha Nanhera	9478751790
276	Sangrur	Sunam	Shaheed Udham Singh Mahil	Harmail Kaur	Harmel Kaur	Vegetable Processing	Village Khadial	9517217967

S. No.	District	Block	CLF/ VO	Enterprise Name	Entrepreneur Name	Enterprise Type	Enterprise Address	Contact No.
			a Block Sangthan					
277	Sangrur	Sunam	Shaheed Udham Singh Mahila Block Sangthan	Darshna Kaur	Darshana Kaur	Vegetable Processing	Village Khadial	7010629030
278	Sangrur	Sunam	Shaheed Udham Singh Mahila Block Sangthan	Baba Kartar Dass	Rajwant Kaur	Others (Food Processing)	Village Jakhepal	7347696178
279	Taran Taran	Chohla Sahib	Chohla Sahib Cluster Federation	Pickles	Joginder Kaur	Others (Food Processing)	Village Mundapind Distt Tarntaran	9814615779
280	Taran Taran	Chohla Sahib	Dilawalpur Mahila Gram Sangathan	Pickles	Gurmit Kaur	Others (Food Processing)	Village Dilawalpur Block Chohla Sahib Distt Tarntaran	9592834324
281	Taran Taran	Chohla Sahib	Jamarai Mahila Gram Sangathan	Achaar	Amarjeet Kaur	Others (Food Processing)	Village Jamarai Teh Khadoor Sahib Distt Tarntaran	9855321167
282	Taran Taran	Tarn Taran	Pandori Gola Mehila Gram Sanghathan	Pickle	Charanjeet Kaur	Others (Food Processing)	Village Pandori Gola Distt Tarntaran	9814615779

A.7. Model Project Profiles

Model Project Profile: Potato

Introduction:

Potato is a cool-season vegetable which is at par with wheat and rice, as one of the most important staple crop in the human diet around the world. Potato is a specialized underground storage stem called "tuber" Potato is consumed by more than one billion people around the world. It is a high-quality vegetable cum food crop used in preparation of more than 100 types of recipes in India. The protein of potato has high biological value than proteins of cereals and milk.

It is utilized in variety of ways, such as in the preparation of

- Chips & Namkeen
- wafers
- flakes
- flour
- starch,
- potato custard powder
- soup
- gravy thickener
- pan cake

The above-mentioned products are used as processed foods. Potato being one of the principal cash crops and gives handsome returns to the farmers due to its demand nationally and internationally for different kinds of utilization.

Planting season for potatoes depends on region, climatic condition and variety of potato. The best time to plant a potato is when temperature is between 15 degrees Celsius to 22 degrees Celsius. Potatoes are propagated by tubers, planted either whole or cut into pieces. To obtain maximum yields, healthy, disease-free tubers, free from mixture of other varieties, should be used. Seed rate depends on tuber size; 800-1000 kg/ha is generally recommended. The potatoes grown from the improved seed give better soil coverage, has a lower incidence of virus attack and higher tuber weight and give higher yields than those from the locally purchased unimproved seed. The proper seed bed conditions, especially soil temperature and moisture are one of the most important factors in ensuring a healthy stand of potato crop. The ideal soil temperature for planting potato is 18- 25-degree C.

Global Scenario of Potato

Potato, popularly known as 'The king of Vegetables' is a major food crop grown by more than 100 countries in the world. Presently China, Russia, India, Poland and U.S.A. contribute to a major share of the total world production. Potatoes are used for a variety of purposes and not only as a vegetable for cooking at home . In fact, less than 50% of potatoes grown worldwide are consumed fresh. The rest are processed into potato

food products & food ingredients, fed to cattle, pigs, and chickens, processed into starch for industrial use, and re-used as seed tubers for growing the next season's potato crop. The dry matter, edible energy and edible protein content of potato makes it nutritionally superior vegetable as well as being a stable food throughout the world. It has become an essential part of the breakfast, lunch and dinner worldwide. Being a short duration crop, its production is more than that of like rice and wheat. Being a bumper crop, lack of post-harvest management results in glut situations in the market because of the surplus yield every year resulting in the decline of the prices drastically.

According to the report of FAO, total vegetable production in the world is 364,808,768 MT out of which China is the largest producer of potato in year 2016-17, with an annual production of 99,122,420 MT followed by India with less than half of the total potato produced by China. The table below shows the major potato producing countries:

S no.	Country	Production(MT)	Area (Ha)	Yield(Production /Area)
1	China	99,122,4290	5,815,140	170.456
2	India	43,770,000	2,130,000	205.493
3	Russia	31,107,797	2,030,858	153.176
4	Ukraine	21,750,290	1,311,600	165.830
5	United States	19,990,950	407,810	490.203
6	Germany	10,772,100	242,500	444.210
7	Bangladesh	9,474,099	475,699	199.162
8	Poland	8,872,445	311,620	284.720

Indian Scenario

The potato reached India in the late 16th and early 17th century. India ranks 2nd as the world's largest potato producing nation after China. Since 1990, per capita consumption of Potatoes has risen from around 12 kg to 17kg per year.

In India, Potato is not primarily a rural staple but a cash crop that provides significant income to the farmers. Potatoes are grown on the Indo-Gangetic plain during the short winter days from October to March while some year-round production took place in relatively high altitude areas in the South. In India, more than 80% of the potato crop is raised in the winter season (Rabi) under assured irrigation during short winter days. About 8% area lies in the hills where production takes place during long summer days from April to October. During rainy season (Kharif) potato is cultivated in Karnataka, Maharashtra, HP, J&K and Uttarakhand. Mentioned below data shows the cultivation of Potato on different season.

Season	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Summer												
Autumn												
Winter												

Potatoes are grown as a short-duration winter crop between the main summer and fall cereal crops throughout the Indo-Gangetic plain of India. The expansion of potato production since the 90s has been made possible by several factors mentioned below.

Advanced potato production technology and availability of adequate cold storage capacity made high yielding, decrease-free seed, available on a much larger scale than was previously possible. The major states of India that cultivates potatoes are Uttar Pradesh, West Bengal, Bihar, Gujarat, Madhya Pradesh, Punjab, Chhattisgarh and Karnataka. As per the data of 2021-22 by National Horticulture Board, the state of Uttar Pradesh dominates the production of Potato in India with highest productivity of 32.3 % of total national potato production.

Proposed Project:

One of the features of the PM FME scheme is to provide support for establishing common infrastructure, to government, private enterprise, or groups. An Incubation Centre is a type of common infrastructure which can be established under the scheme. As per scheme guidelines, the Incubation Centre should involve one or more product lines which could be utilized by the smaller units on a hire basis for processing of their produce. PAIC is proposing to establish a state-of-the-art potato based ready to eat snacks unit in Jalandhar district. End products to be produced in this unit are ready to eat chips and namkeen. Total input capacity of the proposed incubation center will be 0.5Mt/hr.

Project Cost

The project has been estimated to cost Rs 309.00 lacs, including cost of civil works , processing lines, food testing lab and auxiliaries etc. The breakup is as under:

Components	Cost (Rs Lakhs)
Building	50.00
Plant & Equipment	209.00
Food testing lab	25.00
Auxiliaries	20.00
Consultancy/mentoring and pre-operative expenses	5.00
Total	**309.00**

Means of Finance

As per the scheme guidelines, subsidy of Rs 300 lacs will be received from government. Rest of the contribution will be made by the PAIC

Means of Finance	Cost (Rs Lakhs)
Govt subsidy	300.00
Own contribution	**9.00**
Total	**309.00**

However, any increase in the cost of construction and sourcing/installation of utilities shall be borne by PAIC from its own sources.

Civil Works

The Host Institute will renovate the existing structure to house the building for proposed incubation center. Total built up area will be 5000 Sq. ft.

Sr. No	Building Infrastructure	Unit	Area (Sqft)	Rate (Rs/Sqft)	Rs lakhs
1	Processing & packaging hall	Sq ft	2,500	1000	25
2	Finished product storage area	Sq ft	1,000	1000	10
3	Raw material storage area	Sq ft	800	1000	8
4	Washing area	Sq ft	500	1000	5
5	RO Shed	Sq ft	200	1000	2
Total					**50**

Processing Line Machinery

Processing line machinery is expected to cost Rs 209 Lacs. Following is the breakup for the same.

Sr. No.	Machine / Component Name	Proposed Quantity	Capacity	Proposed Cost in Rs Lakh
1	Limpid Coil Based Batch Fryer Namkeen Line 300Kg /Hr	1	300 Kg/Hr	50
2	Flour Sifter W	1		2
3	Hewer H-150 Spiral Kneader	1	150 kg	5
4	Maxi Moulder 6 Cylinders Fully Automatic	1		5.5
5	Industrial Bread Slicer Conveyor Type with Variable Speed	1		3.5
6	Bread Slicer - Heavy Duty	1		1
7	Planetary Mixer Batter	1	100 Lt/40 Kg batter	4.5
8	Cookies Machine	1		9.3

9	Dough Sheeter -	1		3.2
10	Final Proover With Controller Capacity	1		4.7
11	Diesel Operated Rotary Rack Oven	2		24
12	Multi Head Pouch Packing Machine	1	1.6 Ltr	26
13	Wood/Briqutte Vertical Thermopac	1	600000 kcal/Hr	22
14	Cyclomax (Cyc)	1		2
15	Thermopac	1		35
16	Transformer	1	100 KVA	6
17	Main Lt Panel & Cable Work	1		7
18	Electrification	1		2
19	Lighting Work	1		3.5
20	Earthing Pit & Its Distribution Network	1		1.3
21	Dough Sheeter -	2		28
22	Family Pack Auto Feeder Fp 30	1	FP 30 with PLC	9
Total				**209 Lakh**

Operational Plan:

The proposed incubation center is expected to have the capacity of processing 1080 MT annually. It is assumed that the center will function for 270 days in a year. It is assumed that 70% of the installed capacity will be utilized during first year of operation and 100% of capacity utilization will be achieved from 5th year of operation.

Operational Modalities

The proposed Incubation center will be leased out to a private O&M operator having considerable experience in management of such facilities. It will be done through a transparent tendering process as per the guidelines. The O&M operator will be responsible for smooth running of the proposed center ensuring its overall sustainability and commercial viability. The operator will charge user charges from micro enterprises etc.

A fixed amount of leased money will be paid to the Host Institute and all the expenses of operation will be managed by the O & M operator. The Host Institute will ensure coordination with the operator through regular audits in order to ensure achievement of desired objectives. A monitoring and advisory committee will be formed by the host institute, which will have representatives from the Mentor Institute. This committee will be responsible for overall monitoring of the operation carried out by the O & M operator.

Model Project Profile: Tomato

Introduction

Tomato is quite a perishable commodity which offoers a huge potebtial on processing front. Commercial tomato-based products include juice, puree, paste, ketchup, soup, canned and dehydrated tomatoes. Tomato Ketchup word originated from Chinese koechiap meaning 'brine of fish', or generally mentioned as 'spicy sauce'; the word sauce is derived from Latin word salsas that means 'salted'. Ketchup is originally supposed to have been invented in the seventeenth century and was related to a sauce that contained fish brine, herbs, and spices as main ingredients. Tomato ketchup might be just an additional sauce for foods or a dressing for pasta. As we know, tomato is not only delicious as a fresh fruit but also delicious as sauce and even when it has been processed as tomato ketchup, the taste is still tasty. As part of worldwide culinary ingredients, tomato ketchup could be found in any kitchen around the world. Tomato sauces are used in many products including frozen foods, pasta sauces and pizza toppings, etc. A typical tomato sauce would be based on sieved or whole tomatoes, and/or tomato paste. It would also contain water, sugar, vinegar, salt and seasoning. The desired product viscosity would normally be achieved using a starch-based thickener. Tomato sauce is one of the most common sauces made primarily out of tomatoes. It is a product prepared by cooking fresh tomatoes down into a medium thick sauce, which is strained to remove seeds and peels. Due to its rich flavor, low liquid content, very soft flesh that breaks down easily, and the right composition to thicken up into a sauce when cooked, tomato serves as the best option for preparing the sauce.

Market Analysis

According to the "India Ketch Up, Pizza & Pasta Sauces Market Outlook, 2023" report. Tomato Ketchup market is primarily driven by the growing demand for fast food and increasing number of QSRs across the country. According to the report, currently, the market for tomato ketchup's and sauces is anticipated to reach to more than INR 2000 crores. The major companies in this market are Swiss company Nestle with its brand Maggi, which holds a lion share of more than a third of share in the market, Hindustan Unilever Limited with its brand Kissan, that holds a share of more than a quarter of the market and G.D. Foods with Tops brand. These three companies together hold the market share of more than three-fourth of the total market of ketchup and sauces.

Tomato Ketchup Processing: Activities Involved

Pulping

The tomatoes are chopped and precooked, then pumped into Pulping Machines, or Cyclones, which separate seeds, skins, and stems from the pulp. This pulp is Filtered through Screens and processed further into ketchup, and some are stored in a form of paste to use later in the year.

Adding Ingredients and Cooking

The pulp is pumped into Cooking Tanks or Kettles and heated to boiling and Kept at a Temperature above 80°C. Measured amounts of sweeteners, vinegar, salt, spices, and flavorings are added to the tomato pulp. To avoid evaporation of volatile oils they are not added early during the boiling with the spices, salt, and sugar. Powders of onion or garlic are usually added which are procured from various firms which do the

dehydration. The Mixture is Cooked for 30-45 minutes and is Circulated by Rotating Blades installed in the cookers or kettles. The temperature is carefully regulated to insure absorption of the ingredients without overcooking.

Finishing

Once the cooking is completed, the ketchup mixture passes through a Finishing Machine. Finishers are used to Remove Excess Fiber and Particles they do so with the help of screens, creating a smoother consistency. The ketchup is sometimes milled at higher temperatures and pressures to achieve a smoother consistency.

Removing air

The ketchup is De-aerated to Prevent Discoloration and Growth of Bacteria. Excess air may cause unattractive air pockets and impede the closure process.

Filling

To prevent contamination, the ketchup passes from the receiving tanks to the Filling Machines at a temperature Not Lower than 88°C. The containers are filled with the ketchup and Immediately Sealed to Retain the Freshness of the product. Ketchup containers are available in various sizes and shapes.

Cooling

The containers are cooled to prevent Flavor Loss through Stack Burning, which occurs when ketchup stays at high temperatures after cooking is complete. Containers of ketchup are cooled in cold air or cold water.

Labelling and Packing

Finally, the ketchup containers are Labelled and coded with product information, including Ingredients, Date, Location of Manufacture, and Shelf-Life. The bottled ketchup may be inspected again before shipping. The entire process of Ketchup manufacturing generally Takes two to three hours.

Proposed Project:

One of the features of the PM FME scheme is to provide support for establishing common infrastructure, to government, private enterprise, or groups. An Incubation Centre is a type of common infrastructure which can be established under the scheme. As per scheme guidelines, the Incubation Centre should involve one or more product lines which could be utilized by the smaller units on a hire basis for processing of their produce. PAIC is proposing to establish a state-of-the-art tomato processing unit in Kapurthala district. End products to be produced in this unit are ready tomato ketchup and puree. Total input capacity of the proposed incubation center will be 5MT/day.

Project Cost

The project has been estimated to cost Rs 214.11 lacs, including cost of civil works, processing lines, pre-operative & preliminary expenses etc. The breakup is as under:

Components	Cost (Rs Lakhs)
Building	47.20
Plant & Equipment	116.91
Food testing lab	25.00
Auxiliaries	20.00

Consultancy/mentoring and pre-operative expenses	5.00
Total	**214.11**

Means of Finance

The estimated cost for the establishment of the Incubation Centre falls within the prescribed budget earmarked under the scheme guidelines. Land will be provided by the Host Institute i.e. PAIC.

Means of Finance	Cost (Rs Lakhs)
Govt subsidy	214.11
Total	**214.11**

However, any increase in the cost of construction and sourcing/installation of utilities shall be borne by PAIC from its own sources

Civil Works

The Host Institute will renovate the existing structure to house the building for proposed incubation center. Total built up area will be Sq. ft.

Sr. No	Building Infrastructure	Unit	Area (Sqft)	Rate (Rs/Sqft)	Rs lakhs
1	Processing & packaging hall	Sq ft	3,000	800	24.00
2	Finished product storage area	Sq ft	1,200	800	9.60
3	Raw material storage area	Sq ft	1,000	800	8.00
4	Washing area	Sq ft	500	800	4.00
5	RO Shed	Sq ft	200	800	1.60
Total					**47.20**

Cost Breakup for Processing Lines

Machinery and equipment are expected to cost Rs 116.91 lacs. Auxiliaries are expected to cost another Rs 20 lacs. Following is the breakup of machinery details.

Sr. No	Machineries Required for Processing	Quantity	Capacity	Total Cost (in Rs Lakhs)
A	**Plant & Machinery**			
1	Tomato Washer	1	5 MT/ day	5.0
2	Inspection conveyor	1		3.5
3	Sorting grading line	1		7.0
4	Crusher	1		2.5
5	Cold & hot break system	1		4.7
6	Pulper	1		4.1
7	Evaporator	1		8.5
8	Steam Jacketed Kettles	3		15.0

9	Homogenizer	1		10.0
10	Overhead filling tank	1		5.0
11	Steam boiler	1		12.0
12	Rotary bottle washer	1		6.0
13	Double head pneumatic filler	1		10.0
14	Crown corking machine	1		2.05
15	Induction Sealer	1		2.56
	Sub Total (A)			**97.91**
B	**Utilities**			
1	Weighing balance	2	100kgs	4.0
2	Floor cleaner/vacuum mop machine	1	3-5HP	2.0
3	Diesel generator power backup	1		10.0
4	Transportation & Installation			3.0
	Sub Total (B)			**19.0**
	Total P&M			**116.91**
C	**Auxiliaries**			
1	RO processing units	1	1000LPH	10.0
2	ETP	1		10.0
	Sub Total (C)			**20.0**

Operational Plan:

The proposed incubation center is expected to have the capacity of processing 900 MT annually. It is assumed that the center will function for 180 days in a year. It is assumed that 70% of the installed capacity will be utilized during first year of operation and 100% of capacity utilization will be achieved from 5th year of operation.

Operational Modalities

The proposed Incubation center will be leased out to a private O&M operator having considerable experience in management of such facilities. It will be done through a transparent tendering process as per the guidelines. The O&M operator will be responsible for smooth running of the proposed center ensuring its overall sustainability and commercial viability. The operator will charge user charges from micro enterprises etc.

A fixed amount of leased money will be paid to the Host Institute and all the expenses of operation will be managed by the O & M operator. The Host Institute will ensure coordination with the operator through regular audits in order to ensure achievement of desired objectives. A monitoring and advisory committee will be formed by the host institute, which will have representatives from the Mentor Institute. This committee will be responsible for overall monitoring of the operation carried out by the O & M operator.

Model Project Profile: Millet Processing

Background and Introduction

In ancient days millets were consumed as the staple product in the form of porridge and other forms which makes our ancestors with all immunity and wonderful healthy body. Nowadays in this fast-moving internet world, we are all depend on fast food culture as there is no time to spend to take or think about millets or millets-based food products in our day-to-day life.

Varieties of Millets:

- ✓ Pearl Millet (Bajra)
- ✓ Foxtail Millet (Kangni, Kakum, Rala)
- ✓ Kodo Millet (Koden, Kodra)
- ✓ Little Millet (Kutki, Shavan)
- ✓ Barnyard Millet (Jhangora, Sanwa)
- ✓ Sorghum (Jowar)
- ✓ Finger Millet (Mundua, Ragi)

There are about 6,000 varieties of millet throughout the world, and since they are not fussy about soil and water, they are a major source of energy and protein for more than a billion people in arid and semi-arid regions. Millets are highly nutritious, non-glutinous and non-acid forming grains. Properties which make them soothing and easy to digest. In fact, it is a food often cooked during fasting in India. Plus, they are super versatile so you can go all out and make a huge variety of delicious dishes with them.

Millet is a rich source of protein, iron, and calcium.

100 grams of millet provides the following nutrients:

• Calories: 353 kcal

• Dietary Fiber: 5.2 grams

• Protein: 9.8 grams

• Carbohydrate: 66.6 grams

• Fat: 3.6 grams

• Iron: 1.7 mg

• Vitamin B-6: 0.15 mg

• Calcium: 35 mg

• Vitamin B2: 0.09 mg

• Vitamin B3: 2 mg

India, Niger, and China are the largest producers of millet in the world, accounting for more than 55% of global production. For many years, India was the world's major producer of millet. However, in recent years, millet production has increased dramatically in Africa.

The global millet production was estimated at 27.8 million tons. India is the largest global producer with a 41.0% global market share. In the last two decades, the importance of millet as food staples, particularly in India, has been declining due to various factors, including rising incomes, growing urbanization, and

government policies. More than 50% of the millet production is currently finding its way into alternative uses as opposed to its consumption only as a staple.

In Punjab, policymakers are now seriously considering crop diversity, a marked shift away from a previous emphasis on fields of solely wheat or rice. The problem is those crops use lots of precious groundwater, which is fast being depleted. State data shows that groundwater is being overdrawn by 14 billion cubic metres per year. In 1984, less than half of the state's "administrative blocks" were over exploited, today it is nearing 80%.

Proposed Project

One of the features of the PM FME scheme is to provide support for establishing common infrastructure, to government, private enterprise, or groups. An Incubation Centre is a type of common infrastructure which can be established under the scheme. As per scheme guidelines, the Incubation Centre should involve one or more product lines which could be utilized by the smaller units on a hire basis for processing of their produce. PAIC is proposing to establish a state-of-the-art millet based incubation center in Ludhiana district. End products to be produced in the proposed incubation center during initial stage are Cookies, Pizza Base & Noodles. More products will be added in the near future as per demand. Total input capacity of the proposed incubation center will be 400 MT/annum.

Project Cost

The project has been estimated to cost Rs 224.00 lacs, including cost of civil works, processing lines, plant & machineries, pre-operative & preliminary expenses etc. The breakup is as under:

Components	Cost (Rs Lakhs)
Building	50.00
Plant & Equipment	119.00
Food testing lab	25.00
Auxiliaries	25.00
Consultancy/mentoring and pre-operative expenses	5.00
Total	**224.00**

Means of Finance

As per the scheme guidelines, total cost can be covered through the subsidy component of the scheme.

Means of Finance	Cost (Rs Lakhs)
Govt subsidy	224.00
Total	**224.00**

However, any increase in the cost of construction and sourcing/installation of utilities shall be borne by PAIC from its own sources.

Civil Work

The Host Institute will renovate the existing structure to house the building for proposed incubation center. Total built up area will be 5000 Sq. ft.

Sr. No	Building Infrastructure	Unit	Area (Sqft)	Rate (Rs/Sqft)	Rs lakhs
1	Processing & packaging hall	Sq ft	2,500	1000	25
2	Finished product storage area	Sq ft	1,000	1000	10
3	Raw material storage area	Sq ft	800	1000	8
4	Washing area	Sq ft	500	1000	5
5	RO Shed	Sq ft	200	1000	2
Total					**50**

Processing Line Machinery

Processing line machinery is expected to cost Rs 119 Lacs. Following is the breakup for the same.

Sr. No	Machineries Required for Processing	Quantity	Capacity	Total Cost (in Rs Lakhs)
1	Weighing balance	Total 3(1 in each category)	10-15kgs, 25-50kg	3.00
2	Grinding machine	3	5HP	15.00
3	Vibrating Screen	3		5.00
4	Pressing machine with various dies	4		20.00
5	Oil Fired Kiln	2		15.00
6	Semi-Automatic packing machine	2	Double headed	25.00
7	Metal cylinders for printing of pouches	20		8.00
8	Silent DG	1	500KVA	24.00
9	PP Crates	200		2.00
10	MS Pellets			2.00
Total				**119.00**
Utilities				
1	RO processing units	1	100KLD	10.00
2	ETP	1	100KLD	15.00
Other Total				**25.00**

Operational Plan:

The proposed incubation center is expected to have the capacity of processing 400 MT annually. It is assumed that the center will function for 270 days in a year. It is assumed that 70% of the installed capacity

will be utilized during first year of operation and 100% of capacity utilization will be achieved from 5th year of operation.

Operational Modalities

The proposed Incubation center will be leased out to a private O&M operator having considerable experience in management of such facilities. It will be done through a transparent tendering process as per the guidelines. The O&M operator will be responsible for smooth running of the proposed center ensuring its overall sustainability and commercial viability. The operator will charge user charges from micro enterprises etc.

A fixed amount of leased money will be paid to the Host Institute and all the expenses of operation will be managed by the O & M operator. The Host Institute will ensure coordination with the operator through regular audits in order to ensure achievement of desired objectives. A monitoring and advisory committee will be formed by the host institute, which will have representatives from the Mentor Institute. This committee will be responsible for overall monitoring of the operation carried out by the O & M operator.

Model Project Profile: Meat Processing

Introduction:

The meat production in India is 2.3 million tons per year (2010-2011). India exports more than 500,000 tons of meat of which majority is buffalo meat. Indian buffalo meat is witnessing strong demand in international markets due to its lean character and near organic nature. West Bengal is the highest producer of meat in India followed by Andhra Pradesh, Maharashtra, Uttar Pradesh, and Bihar. It is also the largest consumer of meat products including “fresh” meat.

The meat-processing industry consists of establishments primarily engaged in the slaughtering of different animal species, such as cattle, hogs, sheep, lambs, or calves, for obtaining meat to be sold or to be used on the same premises for different purposes. Processing meat involves slaughtering animals, cutting the meat, inspecting it to ensure that it is safe for consumption, packaging it, processing it into other products such as sausage or lunch meats, delivering it to stores, and selling it to customers. The meat-processing industry is a separate entity from the meat-packing industry: Processing involves taking the meat in its raw form and turning it into another product that is marketable, safe for consumption, and attractive to consumers. Packaging is often an important part of the meat-processing industry because processed meats often take on forms that are not natural shapes. Sausage, for example, is sometimes sold in tubelike packages sealed on either end with a metal clasp while hot dogs are sold in bunches of eight in many cases, and they usually are contained in a plastic pouch.

Meat is highly perishable product. Canned meat can be preserved for a long duration without any loss in the quality. Canned meat would be ready to serve product and could be used instantly. Meat processing waste can be utilized for preparation of fish feed, animal feed and as a manure.

The process starts with slaughter of sheep/goat, dressing, cleaning, deboning of meat and cutting it into pieces of 6-7 cm and preparation of various ingredients. Then these ingredients are cooked. After mincing, all the ingredients are properly mixed and pre-heated at around 80-85°C. Finally, they are filled into lacquered cans; cans are sealed and processed/sterilized at a pressure of about 15 lbs. PSI for about 40-45 minutes. Cans are immediately cooled, labelled, and packed. The product should have a thick free-flowing consistency with a total soluble solid content of not less the 13%.

Meat processing by-products have been widely used both as a protein-rich food ingredient and a nutraceutical agent. Despite the amount of published research and the promising results that have been obtained in this field, many aspects of meat processing by-product use still need to be investigated. Technological advances have made it possible to extract different protein fractions from meat, poultry, and fish processing by-products. Moreover, enzymatic, chemical, and fermentative hydrolysis in vitro has been implemented to simulate the breakdown of these proteins in digestion.

One of the advantages of canned meat is that is ready for eating. All one must do is open it and you have an instant meal. Since there are a variety of canned meats to choose from, you can have anything you want as your heart desires. Canned meat is easy and handy.

Proposed Project:

One of the features of the PM FME scheme is to provide support for establishing common infrastructure, to government, private enterprise, or groups. An Incubation Centre is a type of common infrastructure which can be established under the scheme. As per scheme guidelines, the Incubation Centre should involve one or more product lines which could be utilized by the smaller units on a hire basis for processing of their produce. PAIC is proposing to establish a state-of-the-art meat processing(canning unit) in Barnala district. Total input capacity of the proposed incubation center will be 460MT/annum.

Project Cost

The project has been estimated to cost Rs 241.00 lacs, including cost of civil works , processing lines, food testing lab and auxiliaries etc. The breakup is as under:

Components	Cost (Rs Lakhs)
Building	50.00
Plant & Equipment	136.00
Food testing lab	25.00
Auxiliaries	25.00
Consultancy/mentoring and pre-operative expenses	5.00
Total	**241.00**

Means of Finance

As per the scheme guidelines, total amount can be covered through government subsidy component.

Means of Finance	Cost (Rs Lakhs)
Govt subsidy	241.00
Total	**241.00**

However, any increase in the cost of construction and sourcing/installation of utilities shall be borne by PAIC from its own sources.

Civil Works

The Host Institute will renovate the existing structure to house the building for proposed incubation center. Total built up area will be 5000 Sq. ft.

Sr. No	Building Infrastructure	Unit	Area (Sqft)	Rate (Rs/Sqft)	Rs lakhs
1	Processing & packaging hall	Sq ft	2,500	1000	25
2	Finished product storage area	Sq ft	1,000	1000	10
3	Raw material storage area	Sq ft	800	1000	8
4	Washing area	Sq ft	500	1000	5

5	RO Shed	Sq ft	200	1000	2
Total					**50**

Processing Line Machinery

Processing line machinery is expected to cost Rs 136 lacs and following is the breakup for the same.

S.N.	Machinery Details	Price (In Rs Lakhs)
1	Slaughterhouse Equipment's	17.0
2	Ps-steam Boiler: Ps-500 Kgs. /Hr. Capacity	12.0
3	PS-Working Table: Top Stainless Steel 304	9.5
4	Ps- Steam Jacketed Kettle: 50 Gallons (450 Liters)	1.2
5	Straight line Exhaust Box: Capable of Passing 2 cans at a time.	7.5
6	Canning Retort: with thermometer & Pressure gauge capacity 280/300 A21/2 Cans.	1.5
7	Electric Hoist: 2 Ton Capacity	1.2
8	Complete Reforming & Seaming unit	19.5
9	Aluminum & SS Vassals of Various sizes	1.1
10	Meat Mincer	10.5
11	Refrigerator-complete unit of Freezer	18.0
12	Weigh scale – large	2.0
13	Masonry tanks for cooling/pickling	9.0
14	Laboratory Equipment	18.0
Total		**136.00**

Operational Plan:

The proposed incubation center is expected to have the capacity of processing 460 MT annually. It is assumed that the center will function for 270 days in a year. It is assumed that 70% of the installed capacity will be utilized during first year of operation and 100% of capacity utilization will be achieved from 5th year of operation.

Operational Modalities

The proposed Incubation center will be leased out to a private O&M operator having considerable experience in management of such facilities. It will be done through a transparent tendering process as per the guidelines. The O&M operator will be responsible for smooth running of the proposed center ensuring its overall sustainability and commercial viability. The operator will charge user charges from micro enterprises etc.

A fixed amount of leased money will be paid to the Host Institute and all the expenses of operation will be managed by the O & M operator. The Host Institute will ensure coordination with the operator through regular audits in order to ensure achievement of desired objectives. A monitoring and advisory committee will be formed by the host institute, which will have representatives from the Mentor Institute. This committee will be responsible for overall monitoring of the operation carried out by the O & M operator.