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Scope of food-processing in *Kandi* region of Punjab state

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Abstract

Punjab is known as the ‘Bread Basket of India’. But within the Punjab state there are areas which are more food insecure than the rest. The *Kandi* belt is one of them that include districts like Mohali, Roopnagar, Nawanshahr, Hoshiarpur & Gurdaspur. In the present scenario, food processing and value addition have great potential for reducing wastage, accelerating agricultural growth and improving economy of the farmers. Food processing seems to have promising future, provided farmers participation and adequate government support is there. The small scale food processing sector is a major source of employment and adds value to crops by processing.

Keywords: Scope, food processing, Pradhan Mantri Kisan SAMPADA Yojana

Introduction

Punjab, one of the northernmost states of India. The confluence of five rivers has made Punjab’s agricultural land rich and productive. Approximately 82 per cent of the state’s land is under cultivation compared with the national average of 40 per cent. Punjab is also known as the ‘Bread Basket of India’. Punjab has a geographical area of 5.04 million hectares and it is the second largest producer of food grains after Uttar Pradesh. Earlier, the agriculture share in Punjab state domestic product was more than the secondary and tertiary sector but this share has been declining from 40.3 per cent in 1970-71 to 15.6 per cent in 2010-11. Agriculture and allied fields such as dairy, fisheries and animal husbandry are a major source of employment in Punjab. These sectors play an important role in the economy of Punjab. Punjab is also known for high production as well as high productivity of the milk. But within the Punjab state there are areas which are more food insecure than the rest. The *Kandi* belt is one of them. *Kandi* is the name given to the sub-montane region of the Himalayas. The word *Kandi* is derived from the local Dogri word *Kanda* which means an ‘edge’. In *Kandi* region the productivity of various food crops like rice, maize, oilseeds, pulses etc in the region is much lower. Agriculture is uneconomic because of poor soils and low moisture content. Crop varieties suitable for water scarcity areas are not available/developed to withstand the diversities of soil and climatic conditions (Goyal and Rai, 2000). Human activities such as cutting of trees and shrubs for domestic purposes and unmanaged agricultural practices have aggravated the denudation rate. The soil loss has affected the agricultural production and hydrological regime to a large extent

Generally, the areas falling at an elevation of more than 300m above mean sea level comprise the *Kandi* belt in the state. The *Kandi* belt covers an area of 4600 km² in Punjab (nearly 10% of the state’s geographical area). This belt falls in five districts of Punjab (Mohali, Roopnagar, Nawanshahr, Hoshiarpur & Gurdaspur (including Pathankot) which cover 21 development blocks. Climate in the *Kandi* belt is one of extremes, with very hot, dry summers (April-June) and cold winters. Eighty percent of rainfall is received during monsoon i.e. June-September, most of it goes waste through seasonal torrents resulting in acute moisture stress in the summers and the drought like conditions are created during rest of the year. Ground water table is low in this region; therefore, water availability is also a problem for farmers. Soils in this area vary in texture between sandy, sandy loam and loam at surface and loam to clay at

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subsurface level. On the whole, the fertility of the soils is very low. These adverse climatic conditions have largely contributed to the socio-economic backwardness of the *Kandi* tract. Most of the farmers have small (1-2 ha) or marginal land holdings. High yielding varieties of seeds are rarely used by farmers as the area is more suitable for forest vegetation rather than crop cultivation due to lack of irrigation facilities, undulating character of the terrain, and coarse textured soils. Cropping intensity is low as compared to Punjab, as in most of the area, single crop is grown. The fertilizer consumption per hectare is very less in this area; the farmers leave the fields fallow for few years to regain the fertility of the soil.

The per capita availability of food grains in the *Kandi* belt is low which is 1871gm/day and is much below the average of 3188gm/day for Punjab. The per hectare yields of major crops like wheat (3373 kg/ha) and rice (3390 kg/ha) are low as compared to state average (wheat-4208 kg/ha, rice-3870kg/ha). This is largely due to undulating topography, poorer soils, and poor or near absent irrigation facilities. Due to poor agricultural production the availability of food is not adequate. This is also accompanied by poor levels of utilization of food as the region lacks in supply of drinking water, sanitation and health care facilities. (Ahlawat S and Kaur D 2013) ^[1]. Food processing is very important to bring prosperity in the life of people living in *Kandi* region, this sector is seem important because it can increase industrial products, provide employment, earn foreign exchange, increase income level and also provide employment to women and provide base for development for backward areas. It helps to increase agricultural prosperity and agricultural production, support agricultural income, absorb surplus labour force in the rural area and solve the problem of unemployment and under employment which will lead to the decentralization of the process of production and thereby reducing the distribution of income and wealth Their development makes smooth economic development possible bringing about all-round prosperity and improvement in the standard of living in the rural areas.

In the present scenario, food processing and value addition have great potential for reducing wastage, accelerating agricultural growth and improving economy of the farmers. It is an important contributor to substantial employment generation (over 3.1 million employees in organized and MSME sectors). Moreover, in the emerging scenario, there is change in consumption pattern in favour of processed food due to urbanization, rise in per capita income and increase in number of working couples (Dhillon *et al.* 2015) ^[3].

Material and methods

The studies relating to the food processing conducted by different scientists have been consulted and analyzed thoroughly. A critical review of the same has been specified in the results and discussion.

Results and discussion

Food processing or value added agriculture:-

Value-added agriculture refers most generally to manufacturing processes that increase the value of primary agricultural commodities. Value-added agriculture may also refer to increasing the economic value of a commodity through particular production processes, e.g., organic produce, or through regionally branded products that increase consumer appeal and willingness to pay a premium over similar but undifferentiated products.

It can also be described as the process that transforms the raw

agricultural product into something new through packaging, processing, cooling, drying, extracting, and other processes that change a product from its original raw form. As a result of this transformation, the customer base of a product and revenue sources for the producer are expanded.

In this strategy, farming is no longer confined to the cultivation of vast tract of land or the care for a large number of animals in order to be profitable. Here, even those who own less than an acre could achieve viable farming simply by extending an agricultural product's potential so that its salability is enhanced. For example, if a producer farms strawberries, he should not only sell the crop as fresh berries since he could also profit from its other portions by producing other products such as strawberry jelly and syrup.

To meet the current demand of food materials, the industrial food processing has emerged. The small scale food processing sector is a major source of employment and adds value to crops by processing. With food processing, it is possible to maintain a nutritious and safe food supply for the millions of people that inhabit urban and rural areas. Improvement in processing efficiency, by increased yield of usable product, is a tangible means of reducing food loss and increasing food supply. In order to develop *Kandi* area of Punjab into a herbal hub, the state government has assured technical and marketing help to progressive farmers and Self Help Groups (SHGs) with their products to compete in the open market. The products manufactured/produced by the Self Help Groups, the cooperatives like Markfed and Milkfed would also lend a helping hand by exploring the possibilities of selling these quality products in domestic and international markets. *Kandi* area was enriched with natural resources and its economic conditions could be improved by ensuring the optimum utilisation of these resources. Farmers of the area would be trained for the cultivation and processing of herbs, pickles, squashes, juices, chutneys, Trifhala and Aamchur. *Kandi* area is more suitable for horticulture crops. Special efforts should be made to develop this area as a horticulture belt for fruits like Amla, Guava and Kinnow. *Kandi* area also needs to be developed for organic farming of horticultural and other crops.

Avenues for value addition in agriculture

- 1. Post-harvest primary processing:** This involves cleaning, sizing and packaging. This is primarily applicable to fruits and vegetables. At this level there is a very small value addition but also very little business risk.
- 2. Post-harvest secondary processing:** This involves basic processing, packaging and branding. This is applicable to grains and grains products. For example, wheat (*atta*, *suji*), maize (*corn flour*, *animal feed*), etc. The industry needs consistent and reliable supply chain and competitive price of the basic commodities. It is a high volume, low margin business.
- 3. Tertiary processing:** This involves complex processing, technologies, equipment and finances. Thousands of products can be made from primary and secondary products like edible oils, essential oils, preserved and dehydrated fruits and vegetables, ketchups and sauces etc. High-end processing is a global industry. High margin, low volume products are produced here.

Processing in *Kandi* area

Kinnow is most important fruit crop of Punjab with production of about 1 million tonnes. It is being processed for

the production of juice. Further, many by-products such as pectin and limonin can be produced. Guava, the second most important fruit, can be processed into juice, pectin and various value added products. The processing capacity of the 2 units at Abohar and Hoshiarpur is only 170 thousand tonnes per annum. More such multi-fruit processing units should be established.

Ash guard: Mature ash gourd fruits can be stored for many months and may be used for the preparation of candy and preserves, locally called *petha* (Eskin and Landman 1975) [4]. *Petha*, a sweet dish is boon for patients suffering from hypertension. Apart from the preparation of candy, large quantities of ash gourd fruit is utilized in the manufacture of AP. Srivastava *et al.* (2006) [7] developed jaggery based ash gourd candy which can be stored for 45 days under refrigerated condition. AP is manufactured in different parts of the country at cottage scale under unhygienic environment. The quality of AP in terms of sensory and physico-chemical attributes varies from one supplier to another.

Pulses: Pulse milling is the third largest food processing industry after rice and flour milling. An estimated 75% of pulses produced are processed for making dal in mills of different capacities.

The legend of the *Kandi*, Punjab state would be incomplete without taking into consideration main crops since there is a vast scope of processing in some of these crops.

Maize: Punjab is producing about 500 thousand tonnes of maize. Under crop diversification plan, there is a proposal to increase area under cultivation of maize to about 4 times which will lead to higher maize production. At present, there are two wet milling and one dry milling plants with a capacity of about 60 thousand tonnes per annum. Starch is the main product from maize which is used in various food and non-food uses. Glucose, corn syrup and dextrose extracted from maize find application in medicine and food industry. Gluten, germ and fibre are used for animal feed. Maize germ oil has potential for food and pharmaceutical uses. Dry milling is done to produce grits and flour that can be used for making corn flakes, chips, etc. and it needs to be scaled up. Baby corn, as fresh and processed, and popcorn have good potential. Entrepreneurs should be given support to establish maize processing units in the state.

Rice: Punjab is producing 16.3 million tonnes of paddy. The state has 20 modern rice mills and about 3500 rice shellers to process the produce. The bran removed during milling is used for oil extraction, animal feed and non-food applications. Broken rice is used for making traditional and extruded snack foods and breakfast cereals. The packaged brown rice is becoming popular among the health conscious people. There is need to modernize the existing shellers and install large scale modern rice mills. It is also suggested that high capacity modern storage facilities should be developed to store surplus basmati during the glut years. In the following year, the farmers be informed about quantity of produce lying in the stores and advised to sow basmati as per demand of domestic and export markets.

Wheat: Punjab produces 17.6 million tonnes of wheat, majority of which is consumed in the form of whole wheat flour. The rest is processed into refined flour for use in bakery products such as bread, buns, cakes, cookies, biscuits and

rusks. Presently there are about 75 roller flour mills and a large number of *atta chakis* in the state for producing flour and allied products. Almost 50% mills in the state are operative at present at 1/3rd capacity because of taxation policies compared to the neighbouring states like Himachal Pradesh, Jammu and Kashmir, Rajasthan and Delhi.

Sugarcane: The state has 22 sugar mills, including 6 sick ones. Gur (Jaggery) is sugarcane based natural sweetener made by the concentration of sugarcane juice without any use of chemicals. There is a need to modernize them and revive sick units. Processing of sugarcane juice into various products like *gur* and *shakkar* and that of juice per se holds a good potential for scaling up. The development of different value added products from jaggery and their commercial availability becomes needs of the hour to sustain future profitability in the jaggery trade. (Nath *et al.* 2015) [5]

Agro forestry: In Punjab can be taken up successfully and economically, particularly in the foot hills (*Kandi* area) and 'bet' areas of the State, to meet this demand and also achieve long term sustainability and diversification of agriculture.

Table 1: Some value added products of crops of *Kandi* region

Sr. No.	Crop	Value added/peocessed products
1	Sugarcane	Jaggery, Sugar, sucrose, syrup, fibre (cellulose) etc.
2	Ash gourd	Sweets, Soup etc.
3	Amla	Juice, Candy, Preserves, Essential oil etc.
4	Guava	Juices, Jams etc.
5	Kinnow	Juices, Marmalades, Jams etc.
6	Til (Sesame)	Oil etc.
7	Linseed	Oil, fiber etc.
8	Honey	Processed honey etc.
9	Milk	Sweets, Ghee, Dairy products etc.
10	Wheat	Flour, Bread etc.

Government initiative for agro-based industries

Pradhan Mantri Kisan SAMPADA Yojana - Pradhan Mantri Kisan SAMPADA Yojana (Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters) with an allocation of Rs. 6,000 crore for the period 2016-20 coterminous with the 14th Finance Commission cycle. PM Kisan SAMPADA Yojana is a comprehensive package which will result in creation of modern infrastructure with efficient supply chain management from farm gate to retail outlet. It will not only provide a big boost to the growth of food processing sector in the country but also help in providing better returns to farmers and is a big step towards doubling of farmers income, creating huge employment opportunities especially in the rural areas, reducing wastage of agricultural produce, increasing the processing level and enhancing the export of the processed foods.

The following schemes will be implemented under PM Kisan SAMPADA Yojana:

1. Mega food parks: The Scheme of Mega Food Park aims at providing a mechanism to link agricultural production to the market by bringing together farmers, processors and retailers so as to ensure maximizing value addition, minimizing wastage, increasing farmers income and creating employment opportunities particularly in rural sector. 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 consist of supply chain infrastructure including collection centers, primary processing centers, central processing centers, cold chain and around 30-35 fully developed plots for entrepreneurs to set up food processing units.

2. **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.
3. **Creation/ Expansion of Food Processing/ Preservation Capacities (Unit Scheme):** The main objective of the Scheme is to facilitate their participation under the Scheme. 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. Scheme is implemented through organizations such as Joint Ventures/ Farmer Producers Organization (FPOs)/ NGOs/ Cooperatives/ SHG's/ Pvt. Ltd companies/ individuals proprietorship firms engaged in establishment/ upgradation/ modernization of food processing units.
4. **Infrastructure for Agro Processing Cluster:** 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. Agro processing clusters set up by Project Execution Agency (PEA)/ Organisation such as Govt./ Joint Ventures/ NGOs/ Cooperatives/ SHGs/ FPOs/ Private Sector/ individuals etc. and are eligible for financial assistance subject to terms and conditions under the scheme guidelines.
5. **Creation of Backward and Forward Linkages:** 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. The Ministry has engaged Technical Agencies (TAs) for assisting farmer/ producer groups including Farmer Producer Companies, Farmer Producer Organization, and Self Help Groups.
6. **Food safety and quality assurance infrastructure:** Quality and Food Safety have become competitive edge in the global market for food products. For the around development of the food processing sector in the country, various aspect of Total Quality Management (TQM) such

as quality control, quality system and quality assurance should operate in a horizontal fashion. Apart from this, in the interest of consumer safety and public health, there is a need to ensure that the quality food products manufactured and sold in the market meet the stringent parameters prescribed by the food safety regulator.

Conclusion

Food processing industry holds tremendous potential to grow, considering the still nascent levels of processing at present. Farmers are being encouraged by providing subsidies for crop diversification and entrepreneurs are being supported to install processing plants and cold stores. Punjab Agricultural University is regularly organizing several short duration training courses for rural youth, farmers, and farm women towards the development of entrepreneurial skill for self-employment, resource generation and rural economy. To strengthen the trainings, the farmer's participation in these courses needs to be strengthened.

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