



Horticultural Crop Processing Industry: Potential and Prospects Madhya Pradesh

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(Received: 19 November 2022; Revised: 21 December 2022; Accepted: 31 December, 2022; Published: 14 January, 2023)

(Published by Research Trend)

ABSTRACT: This paper analyses the potential and prospects of the horticulture crop processing industry in Madhya Pradesh. Food processing is one of the most effective solutions to reduce the wastage of fruits and vegetables. In India, the processing of fruits and vegetables is extremely low and is below 2.2%. Value addition to the raw produce in India is as low as 7%, in comparison to China (23%), the Philippines (45%) and the UK (88%). It is estimated that a 1% growth in food processing has the potential to generate additional direct employment for about five lakh individuals, and indirect employment for about 15 lakh individuals. Thus, the processing industry holds tremendous potential not only for contributing to the country's Gross Domestic Product (GDP) but also for generating employment in rural areas and business opportunities for entrepreneurs. Madhya Pradesh is the 3rd largest producer of vegetables and 7th largest producer of fruits in India with a total production of 317.39 lakh metric tons with 50 to 87% surplus availability of horticultural produce, which can directly be utilized for food processing. The paper would also assess why it is a favourable destination for food processing units and the production of value-added products. This assessment would be done based on factors such as the area under horticulture, surplus production, price realisation trends etc. The paper also made suggestions to achieve the future progress of this sector in Madhya Pradesh.

Keywords: Horticulture sector, food processing, value-added products, farmer income, food industry.

INTRODUCTION

Madhya Pradesh (MP) plays a significant role in the nation's agriculture and horticulture sectors. In horticultural crops, the state has emerged as one of the leading states in India. It ranks 3rd in the overall production of horticultural crops having an 8.14 % share of national production with 21.76 lakh hectares of the area covered under horticulture crops with the production of 317.39 lakh metric tons (MT).

Madhya Pradesh is the 3rd largest producer of vegetables and 7th largest fruit producer in India. Oranges, Guava, Lime, Lemon, Banana, Mango, and Custard apples are the major fruits grown in Madhya Pradesh. The state ranks 1st in the production of Oranges (20.39 lakh MT) with 60% of surplus production, while guava ranks 2nd in production (6.68 lakh MT) with a 62% surplus. In vegetables, the state is the leading producer of tomatoes in India with 27.88 lakh MT production and 63% surplus. In the case of spices and medicinal crops, the state has a lot of surplus production that can be diverted to the food processing sector. Global fruit and vegetable industry trends reflect that the sale of processed commodities has increased drastically in the last five years. A trend shows that about 40% of the processed food industry revenue

comes from canned fruit and vegetables, whereas, frozen fruits and vegetables, juices and dried and dehydrated foods contribute about 36%, 14% and 10% respectively. To boost the food processing sector, the Ministry of Food Processing Industries (MoFPI), Government of India (GOI) under *Pradhan Mantri Kisan Sampada Yojna* provides financial assistance through various schemes for setting up of mega food parks, agro-processing clusters, creation and expansion of food processing industries in India.

In the year 2020-21, MoFPI launched a pan India scheme called 'Pradhan Mantri Formalisation of Micro Food Processing Enterprises', under Atmanirbhar Abhiyan in partnership with the State/ UT Governments which aims to enhance the competitiveness of existing individual micro-enterprises in the unorganized segment of the food processing industry and promote formalization of the sector and support Farmer Producer Organizations (FPOs), Self Help Groups (SHGs) and producers cooperatives along with entire value chain. Apart from these schemes Government of Madhya Pradesh is encouraging large & MSME food processing industries by providing financial assistance of 15% to 60% in plant and machinery costs along with several other incentives.

CURRENT TRENDS IN HORTICULTURE CROP PRODUCTION AND FOOD PROCESSING INDUSTRY OF MADHYA PRADESH

In the context of the creation of a food processing industry, as mentioned above, Madhya Pradesh is one of the leading producers of oilseeds, pulses, spices and horticultural produce. This rich agro-horticulture status is supported by the presence of flourishing livestock. The favourable agroclimatic conditions and variety of soils for agriculture production make it a potential agricultural production hub of the country (Kahan, 2012).

Area, Production, and Productivity under Horticulture in Madhya Pradesh. An increase in area, increase in overall production, as well as productivity in Madhya Pradesh, has provided the opportunity in the food processing sector. As per the statistics released by Horticulture Area Production Information System (HAPIS), the area under horticultural crops has increased from 2001205.3 hectares in 2018 to 2176404.42 hectares in 2019 (HAPIS, 2018-2019) (Kannan, 2014). The area, production and productivity of horticultural crops in Madhya Pradesh are presented in Table 1.

Surplus Production of Horticulture Crops in Madhya Pradesh. In addition to an increased area under horticulture crops, production and productivity have also been increased with a substantial surplus of horticulture crops (Table 2). This surplus allows assured availability of raw materials for industries, needed for producing value-added products and strengthening the food processing sector.

Surplus production is an ideal pre-requisite to encourage and boost its use in the food processing industry. Food processing and production of value-added products would reduce this surplus from going to waste while providing an alternative source of income to farmers and small-scale entrepreneurs.

Price Realisation Trends in Madhya Pradesh. Another factor that makes the food processing industry a desirable sector to enter is the price trend of Madhya Pradesh. The horticulture produces in Madhya Pradesh, *i.e.*, the raw material for the food processing industry is available at a cheaper rate than its counterparts like Delhi and Maharashtra. The wholesale price trends in Madhya Pradesh as against Maharashtra (chosen randomly) have been presented in Table 3.

The above data shows that the prices in Madhya Pradesh are substantially lower when compared with Maharashtra. This is especially true for districts that are known for the production of certain crops. For instance, Bhopal and Hoshangabad are known for the production of guava which is grown in substantial numbers there, it

will be cheaper to establish a food processing unit of guava in these districts as against Balaghat which is far away from Guava clusters in Madhya Pradesh.

Food Processing Industry of Madhya Pradesh. In recent years, big business houses, budding entrepreneurs and farmers have been gradually taking interest in diversifying their portfolios and entering the food processing industry. As per data from National Mission on Food Processing, several enterprises have been set up in Madhya Pradesh between 2013 and 2017. Table 4 gives a bird's eye view of the enterprises set up across different districts in Madhya Pradesh. Efforts have also been made to provide an impetus to the food processing industry, before which certain challenges should be overcome.

DISCUSSION: Challenges of the food processing industry in Madhya Pradesh

As horticulture sector is consistently growing up in Madhya Pradesh, there are certain issues which are regularly faced by state and the entrepreneurs and industrialists. These issues arise in both the pre-harvesting and post-harvesting stages of horticultural crop processing.

Gaps in Supply Chain or Value Chain Infrastructure and Management: Challenges arising during pre-harvest period are primarily due to the gaps in supply chain infrastructure which arises as a result of inadequate primary processing, storage and distribution facilities (Kumar, 2019). Consequently, the lack of such facilities snowballs into an insufficient connection between the production of such crops and their processing. An insufficient connection between production and processing leads to the seasonality of operations, low-capacity utilisation and not having enough product development and innovation. There also tend to be an institutional gap in the supply chain such as the dependence on Agricultural Produce Marketing Committee markets (also known as APMC markets) and a lack of quality and safety standards.

Lack of Post-Harvest Infrastructure and Management: Another concern affecting the food processing industry is post-harvest losses, which arise due to the lack of proper post-harvest infrastructure and management (ENVIS, DMI 2017). Due to inadequate processing facilities nearby, farmers fail to hold their produce for a long duration hence, they may be forced to sell their produce soon after harvest, irrespective of the prevailing market situation. As a result of this lack of infrastructure and management substantial horticulture produce is wasted resulting in huge loss of crores of rupees (FAO, 1997). Table 5 shows the post-harvest losses occurred and reported in 2017 in Madhya Pradesh.

Table 1: Area, Production and Productivity of Horticultural crops in Madhya Pradesh.

Year	Area (H)	Production (MT)	Productivity (MT/H)
2018	2001205.3	29063018.37	14.52
2019	2176404.42	31739034.52	14.58

Source: HAPIS 2018-2019

Table 2: Surplus Horticulture Produce.

Crops	Surplus, MMT	% of Total Production after Consumption and Post-Harvest Loss
Onion	2.31	71
Tomato	1.96	63
Potato	1.77	57
Orange	1.28	60
Banana	1.08	66
Green Peas	0.96	50
Mango	0.35	71
Garlic	0.32	78
Guava	0.32	62
Red Chilli	0.11	87
Pomegranate	0.08	87

Source: Surplus Horticulture Produce. Department of Horticulture and Food Processing (Madhya Pradesh) (2019).

Table 3: Date Wise Prices for Specified Commodity in December 2020.

Crops	Date (d/m)	Maharashtra	Modal Price (Rs./Quintal)	Madhya Pradesh	Modal Price (Rs./Quintal)
Onion	2/12	New Mumbai	3500	Bhopal	2400
Tomato	2/12	Mumbai	3600	Bhopal	1500
Potato	2/12	New Mumbai	3300	Bhopal	3000
Orange	5/12	Fruit Market	1850	Bhopal	1200
Garlic	4/12	Pune	7500	Bhopal	6000
Green Pea	30/12	Mumbai	12500	Jabalpur	2000
Green Chilli	3/12	Mumbai	5000	Bhopal	2500
Guava	9/12	Fruit Market	3500	Bhopal	1000

Source: Date-wise Prices for Specified commodity, AGMARKNET (2020)

Table 4: Food Processing Industries set up in Madhya Pradesh (2013-2017).

Districts	Number of Food Processing Industries	Districts	Number of Food Processing Industries
Agar Malwa	1	Mandsaur	3
Balaghat	28	Morena	14
Barwani	7	Narsinghpur	26
Bhind	2	Neemuch	7
Bhopal	12	Panna	1
Chhindwara	18	Raisen	23
Damoh	2	Rajgarh	1
Datia	1	Ratlam	2
Dewas	10	Rewa	15
Dhar	13	Sagar	5
Guna	3	Satna	22
Gwalior	9	Sehore	8
Harda	3	Seoni	2
Hoshangabad	17	Shajapur	1
Indore	153	Sheopur	2
Itarsi	1	Singrauli	1
Jabalpur	19	Tikamgarh	1
Katni	62	Ujjain	8
Khandwa	9	Umari	1
Khargone	14	Varanasi	1
Mandla	16	Vidhisha	3

Source: Food Processing Industries in Madhya Pradesh, National Mission on Food Processing (2013-2017).

Table 5: Post-Harvest Losses of Important Horticultural crops.

Fruits	Post-Harvest Loss, MT
Orange	90592
Mango	50939
Guava	94170
Banana	127799
Pomegranate	10663 MT
Vegetables	Post-Harvest Loss
Onion	193644
Tomato	470263
Potato	217532
Peas	112015
Spices	Post-Harvest Loss
Garlic	24138
Chilli	8821.05
Coriander	7483

Source: Post-Harvest Loss, Department of Horticulture and Food Processing (Madhya Pradesh) (2017-18)

Lack of Food Processing Infrastructure: Food processing sector allows for raw crops to be stored, marketed or preserved for consumption in off seasons or later. For instance, fruits such as oranges and mangoes being perishable starts to rot after a certain period of time, such fruits can be processed into juices, concentrates, jams, pickles and other allied food products. Other activities that form a part of food processing sector are waxing, packaging, and labelling. Since production has been increasing over the years, surplus produce tends to get wasted at various stages like procurement, storage, and processing due to a lack of infrastructure such as cold storage and food processing units (HAPIS, 2019).

Lack of Entrepreneurial Training and Mind-set: A majority of entrepreneurs interested in establishing food processing units often tend to be farmers and small-scale entrepreneurs. Such prospective entrepreneurs often lack the training in marketing and advertising, packaging and labelling, creating a brand and taking data-driven decisions. Some of them even struggle with just creating a detailed project report of their business idea to incorporate their business and secure loans. This lack of entrepreneurial training stands in the way of farmers and small-scale businessmen interested in diversifying their income portfolios through the establishment of food processing units (Kumar, 2020).

Constraints in securing Finance: One of the biggest hurdles in the establishment of the food processing industry is the constraints that farmers and small-scale entrepreneurs face in securing finance/credit for their businesses (Subrahmanyam, 2000). Without a steady stream of credit needed for capital investments such as buying machinery and securing land for establishing a processing unit as well as working capital, it is virtually impossible for such small-scale entrepreneurs to even consider entering the food processing markets. In such a situation only the State or farmer organisations can provide respite to such entrepreneurs.

The abovementioned challenges are some of the major issues plaguing the food processing industry.

DISCUSSION: Potential and Prospects of the food processing industry in Madhya Pradesh

Madhya Pradesh is a centrally located state in India and has 11 agro-climatic zones out of the total 16 in the country. Owing to which several fruits, vegetables, spices, flowers, medicinal and aromatic crops find equally fertile land and climate in the state for good production. Due to such diverse soil composition and climatic conditions, Madhya Pradesh is one of the leading states in production of Horticulture crops.

In addition to having such a rich diversity in horticulture crops, Madhya Pradesh also holds good ranks in production capacity, it is one of the largest producers of pulses, oil seeds, oranges, spices, gram, soybean and the second largest producer of aonla, garlic, guava, tomato, green peas, food grain and onion in India.

The diverse agricultural and horticultural raw material base and the favourable agro-climatic conditions provide Madhya Pradesh with the leverage needed for

the development of a vibrant food processing industry. The food processing sector has the potential to become the important link between the M.P.'s economy, its agriculture and its industry. This sector can address the major challenges in agriculture such as post-harvest losses, lack of marketing options and low income of farmers. This sector can also provide employment opportunities to the rural population. It is estimated that one per cent growth in food processing has the potential to generate additional direct employment to five lakh people, and indirect employment to about 15 lakh individuals. In M.P. several schemes are enforced to develop the food processing sector and the following areas should be focused that addresses some of the major challenges listed in previous section. Demand for retail, ready-to-eat items and safely processed food are some of the biggest opportunities of this sector.

Building Supply Chain/Value Chain Infrastructure and Management: One of the best ways to kick start the establishment of the food processing sector is by linking the farm and non-farm industries collectively (MoFPI, 2019). This would help with the smooth movement of products from the farm to its ultimate consumers whether it is raw crops or processed products. There is a need to develop the supply chain of major crops, through the identification of retailers and wholesalers of the said crop and its finished products (MoFPI, 2021). Investments are also needed in ancillary infrastructure such as power connectivity, building roadways and storage facilities between the farms and cities (NIAEM, 2020). The farmers can also be encouraged to organise themselves into organisations (formal or informal) where they can leverage their collective strength in building a supply chain which will surely help them to double their income.

Establishing Post-Harvest Infrastructure and Management: The need of the hour for state is to support the establishment of post-harvest infrastructures, including but not limited to, introducing new and improved technology, establishing cold storage, engaging with Indian Council of Agricultural Research (ICAR) institutes and State Agricultural Universities for post-harvest management training. Establishing a robust infrastructure and management would especially help to increase the shelf-life of perishable crops. Additionally, the adoption of simple post-harvest management practices, processing and value addition operations viz., proper harvesting, sorting, grading, packaging, pulping, pickling, drying and dehydration at the farmer's level during the peak season will help to minimize the post-harvest losses as well as doubling the farmer's income (FAO, 1997).

Building Food Processing Infrastructure: Another major challenge plaguing the food processing industry is the need for the development of food processing infrastructure. Lack of knowledge and un-availability of the machinery mandatory for establishment of a food processing unit discourages farmers and small-scale businessmen from taking a step forward in the direction of food processing units. The state must invest in common processing facilities and cold storage facilities

in the form of food parks, agro-processing clusters, irradiation facilities etc which can help a large number of farmers and small-scale food processing units at the same time (HAPIS, 2019). The state can also provide credit to farmers and entrepreneurs looking to enter the food processing industry.

Branding and Marketing: It is only not enough to establish a food processing unit if the entrepreneurs do know how to brand and market their products. Branding helps to identify the manufacturer who can use it to distinguish itself from its competitors. This ability to associate a brand with the owner helps build what is called "brand loyalty" (Boss and Pradhan 2020). Branding is what makes a memorable impression on consumers and helps customers and clients to know what to expect from a certain brand. Branding can also help with the marketing and advertisement of products processed by the same unit and help with packaging as well. Once a brand is established, more products can be sold under the brand umbrella to an established consumer base. This is why there is a need for budding entrepreneurs and farmers to understand branding. There is a need to train such entrepreneurs in branding and marketing strategy – *i.e.*, how to brand, develop a marketing strategy, where to advertise (print media or through online platforms), identify where the customers are and advertise to same, or how to package the products etc. Without an understanding of branding and marketing, it is nearly impossible to create brand loyalty which can transform into a scalable business model.

Training Support. To acquaint the farmers and other small-scale entrepreneurs with the basics of conducting a business such as initiating business, securing loans, keeping accounts, branding, marketing etc., the state should consider providing training support to such persons (Kodidala, 2018). Conducting a business is an acquired skill that requires an understanding of the market, product, customer base etc.

CONCLUSION

The study establishes it clearly that there is lot of potentials of processing of horticultural crops in Madhya Pradesh. Despite of surplus production in the state, the Major problems lie with the lack of post-harvest structures, cold storages, non-availability of processing varieties, lack of knowledge of technical know-how about processing and lack of marketing and branding. Hence, the government should focus more on developing basic infrastructures like road, cold chain facility, transportation so that private player or entrepreneurs may come forward to invest in this

sector. In this context, it is also necessary that research and development must provide an efficient alternative to entrepreneurs for processing of commodity along with quality, income and export opportunities.

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How to cite this article: Vijay Agrawal, Alok Dhar Dubey and Sanjeev Verma (2023). Horticultural Crop Processing Industry: Potential and Prospects Madhya Pradesh. *Biological Forum – An International Journal*, 15(1): 281-285.