CHAPTER III
REVIEW OF LITERATURE

In the present chapter an attempt has been made to review the literature pertaining to various aspects of agro and food processing industry. The review of these studies is of great use as it provides a broad spectrum about the food processing industry. In addition, the review of methodology used in different studies will enable us to formulate suitable methodology to study the different objectives of the present study. This chapter is related to various aspects of agro and food processing industry.

Leung\(^1\) developed a model to estimate the effectiveness of export subsidies net of input distortion so as to arrive at "the effective rate of subsidy". The concept was relevant to products ranging from high to little or no processing. The effective rate of subsidy could therefore be defined as the maximum proportion by which the export subsidy permits resources in the production activity to exceed the value added that they would have in the absence of such subsidy. The basic formula was

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g_j = \frac{V_j - V_j}{V_j}
\]

\(g_j\) = effective rate of subsidy for industry \(j\).
\(V_j\) = value added per unit of \(j\) with the use of export subsidy.
\(V_j\) = Value added per unit of \(j\) without the use of export subsidy.

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The developed model was applied to the U.S. and Canadian exports of flour. The results showed that Canada had negative effective rates of subsidy throughout the years 1960-61 to 1969-70 while the U.S. rates remained positive during this entire period. These estimations provide quantification of the disadvantage caused to Canadian flour exports by export subsidies on flour by large competitors.

Parpia\(^2\) discussed about the science and technology which could be used to convert the economy of developing nations from being predominantly exporters of agricultural raw materials such as spices, cocoa to processors and exporters of finished goods. It was concluded that appropriate technologies must be selected and used in order to produce better quality raw materials at more economical prices. Various areas in different food processing industries were listed which need attention, various factors were listed which help in identifying the problems which the technologies were expected to solve. It was further concluded that the new awareness of technology transfer had arisen over the last 15-20 years, can prove of immense value in speeding up over all economic progress.

Simmons\(^3\) examined two aspects of this industry, the economic viability of the average firm and its characteristic self-employment pattern. For this study, a survey of rural processors was carried out in two villages of

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Zaria Province in 1971 and 1972. Accounting system was drafted for each food enterprise and 45 women in each village were questioned once a month from February through May. Average economic data for a number of firms in six major enterprises were developed. Data relating to six rural small scale food processing enterprises was then compared. It was seen that various firms in the rural food enterprises of Zaria had some common economic features. It was concluded that in no firm, the wage-profits account for more than 30 per cent of total revenue. It was seen that women employed in rural food processing units fulfill many needs other than monetary needs. It was further concluded that the future of the rural food-processing industry looked some what uncertain because of increasing rural demand for modern products and government support system.

Jakate and Ganguly\(^4\) highlighted some of the important issues involved in promoting the marketing of bakery products. It was said that prices play a significant role in marketing of bakery products. Consumption pattern depends upon the food habits. It was concluded that publicity work on a planned basis must be done in order to create consumption. The market for bakery products is susceptible to food habits. A market survey must be conducted and the prospects of the products must be assessed before the enterprise is started. It is necessary to study the market segment and obtain full information on various points enabling the entrepreneurs to decide output.

volume and the pattern of sales. As the bakery products are of perishable nature, the distribution system must be efficient which links products with consumers and reduce the spoilage of products. Along with many other important issues, various new products must be developed so as to match the needs of the consumers.

United Nations Centre on Transnational Corporation\(^5\) studied the effects of the operations and practices of transnational corporations in developing host countries. The study focused on the two major influences, which mostly affected the strategies and behaviour of transnational corporations operating in developing country food processing industries, the competitive structure of the industries at the global and national levels, and government policies, which affected the sector. The study revealed an increasing conglomerate and flexible character of the large food firms. It established that there were important differences in developmental relevance, industry performance and policy options of the host countries among the three broad food industries, sub-sectors of stable food for domestic consumption, branded food export oriented food products industry. It was pointed out that the expectations of the government of host countries that sought foreign investments were only partially met.

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Comelisse, Bishay, Cohen and Terhal\textsuperscript{6} studied the main characteristics of agricultural processing industries influencing the suitability of these industries for developing and developed countries respectively. It was argued that the ratio of value added to gross output (the value added coefficient) was an important criterion in sector evaluation and used this technique in ranking the manufacturing sector of Indonesia, Guatemala, Brazil and Zambia. It was concluded that the contribution to development objectives of some flexible sub-sectors could easily be overestimated. It also appeared that the wide disparity of characteristics of sub-sectors that belong to the category of agricultural processing industries necessitate careful examination of individual sub-sectors before judgement as to their attractiveness for developing countries is pronounced.

Faminow and Sarhan\textsuperscript{7} reported the results from the solution of a mixed integer plant location model of the fed cattle slaughtering and processing industry in the United States. The model was formulated specifically to determine the optimal number, size and location of large-scale fed cattle slaughtering and processing plants in the western corn belt and south west regions. Supply of fed cattle was determined for forty-five supply regions. The results of the analysis suggested a continued movement of the industry


towards fewer but larger plants, which were, are expected to be based on the solution of the MIP plant location model. Improved export potential for the Canadian beef industry into specific U.S. markets was one reason of the U.S. Industry becoming more spatially concentrated.

Mansell, Wright and Kerr \(^8\) suggested an appropriate form of regulated pricing. An increasingly common method was the use of formulas. A large number of possible formulas existed and a considerable diversity among the formulas existed but three groups of formulas were made. The first included those where the producer prices of fluid milk were tied to the prices of industrial milk. The second included a variety of economic equilibrium formulas designed to calculate market-clearing producer prices. The third type consisted of system where a base price was periodically adjusted in response to changes in specific statistical indexes. It was concluded that Type 1 and Type 2 formula did not appear to be viable alternatives in Canadian situation. Economic index formulas lend to be the most practical but the ones used were suspected on theoretical grounds. It was further concluded that it is difficult to design a formula. Formula to be constructed needs to be monitored, reviewed and periodically adjusted to the base price and must be based on clear cut objectives.

Capps and Havlicek\(^9\) identified and assessed the related factors that affect the household demand for meat, poultry and seafood, both nationally and regionally. For this study, a model proposed by Brown and Heien i.e., the \(S_1\)-branch system was employed. It was concluded that meat, poultry and seafood purchases were very sensitive to own-price changes, changes in total expenditure and changes in household size and were less sensitive to cross price changes, differences in degree of urbanisation and regional differences. The differences among the elasticity measures were predominantly due to differences in data bases, commodity grouping and demand systems.

Small Industries Service Institute\(^10\) conducted a survey of the Sangrur district to identify the scope of industrial opportunities in the small scale sector and assess the requirements of infrastructural facilities to accelerate the pace of industrial growth. Various areas of industrial development of the district were studied with the help of relevant data. It was seen that the district was well developed and was rich in agricultural and livestock resources, therefore good potential exists for agro based and livestock based industries.

Adhaoo\(^11\) explained the role and prospects of agro industries in Vidarbha. He stressed the importance of agro industries and said that the agro industries depend not only on the output of agriculture but also on the inputs.

in agriculture like agricultural implements, fertilisers and pesticides etc. Various important agro-industries were also listed down and important conversion ratios between raw materials and processed products were also given. It was further concluded that the area is relatively weak in industry. In order to gainfully employ the rural youth, it was necessary to establish and develop agro-industries giving them employment and improving their social economic conditions.

Al-Zand\textsuperscript{12} examined the various methods and procedures utilised in estimating the marketing cost for food and identified the key variable cost components with the result of which fluctuations in the price of food take place. Al-Zand suggested food marketing cost index which reflect short term food prices behaviour. Measures like food marketing bill and the farm-to-retail price spreads were largely concerned with the decomposity of the consumers food dollars into corresponding shares for farm producers and marketing agents or the return to their corresponding functions. The emphasis of the FMCI was on estimating the combined effects of variable costs incurred in food processing wholesaling and retaility on the observed pattern behaviour of food prices. There was a direct link between the operating cost of food marketing and the corresponding food prices. It was further concluded that it is not a substitute for other traditional measures. However it must be used with the support of other measures in order to view the correct picture.

Carter and Mooney estimated the level of protection afforded rapeseed and soybean oil processing in Japan. A new concept of relative rate of protection was introduced. Effective protection measured the rate of protection as percentage of value-added and was distinguished from a measure of protection to the factors of production. The key finding was that rapeseed processing in Japan is favoured over soybean processing because of the structure of vegetable oil import tariffs. Rapeseed had a higher oil content than soybean and thus, with the equivalent import tariffs on oil, it received relatively more protection than soybean processing. Canadian crushers were subject to low, unprofitable margins because of the protection received through Japanese tariffs.

Venkaiah conducted an intensive study of four selected villages covered by four different types of agro-based industries, namely, sugar factory, rice mills, tobacco processing and khandsari sugar factory. Changing pattern of employment, occupations, wages, incomes, migration etc. in the rural areas, because of the setting up of these industries was also studied. It was seen that the employment pattern differed depending upon the nature of agro-based industry. Indirect employment was also looked into. Changes in the cropping pattern consequent upon the setting up of agro-industries resulted in the creation of substantial additional employment in the farm

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sector. The impact of these industries was significant on the income level of all categories of rural population. The impact of these industries on migration was also very significant. Over all impact of these industries at the micro level and macro level were also studies. It was concluded that all these findings were very useful for planners and policy makers.

Gupta & Arora\textsuperscript{15} conducted this analysis to minimise the cost of transportation of soybean from different producing centres to various processing plants in the state. The data was collected from government of India publication, district agricultural officer and the respective plants. In the present study, method of vogel’s approximation was used to determine the initial feasible plan. After determining the initial plan, various cells were evaluated through the modified distribution method and the programme was improved until an optimum was reached. Alternate iterations of the initial feasible plan and the subsequent improved plan which eventually lead to the optimum plan were worked out along with the estimated cost of transportation for each plant-and it was seen that the optimum plan appeared to be accepted to all the plants since it results in the reduction of transportation cost for all the plants. It was further concluded that the transportation model could be effectively used to determine the optimum programme for minimising the cost of transportation. It could also be applied in both public and private sector industries in India.

Hann$^{16}$ examined the viability of traditional and Semi-modern techniques of sugar processing. The alternative technologies have been examined not merely from different points of view-historical, technical, economic, social, political but also under a number of alternative assumptions in regard to some of the basic parameters relating to recovery, interest, time-perspective and so on. The data was based on secondary sources of statistical and other information and on the field work of the Sugar cane processing units of the Bijner district in Uttar Pradesh. It was concluded that the results of the cost-benefit analysis show that VPS was far superior to any other technology both at economic and social prices.

McDonald, Rayner and Bates$^{17}$ presented a frame work for examining certain aspects of the interaction between the food processing and distribution sectors in the U.K. Concentration in the food industry was related to high levels of profit and was partially examined by evaluating profit rates in food processing and food retailing. Relevant data was taken and profit rate defined as percentage of capital worth was taken. Then the regression analysis was applied on this data. Over the period covered by the data, all manufacturing profit rates displayed an absolute decline while retailing profit rates showed a small absolute increase. It was concluded that increasing structural concentration in the food industry have not been detrimental to the


performance goals of economy, efficiency and progress and a stress must be laid on the continued monitoring of competition.

Sukhpal and Vyasulu\textsuperscript{18} attempted to examine the food processing sector of the Punjab taking the secondary data from Annual Survey of Industries, Directorate of Industries and the Directory of Manufacturing Establishment. Structure, growth, production efficiency of the food processing industry and its linkages at the district level were studied. The study related to the period 1979-80 to 1986-87. It was concluded that during 80's factory sector was the most important sector as compared to small scale and the growth achieved in factory sector was much higher than the small scale sector. Various techniques such as rank correlation and regression were also used to study the growth of food processing industry at district level. The capital and labour productivity's were found to be lower in small scale sector as compared to other two sectors.

Desai, Gupta and Namboodiri\textsuperscript{19} analysed the development and financial performance of selected food processing industries. The study was based on both secondary data and case studies of selected co-operatives. The performance of the selected industries were analysed by considering their inputs and factory productivity, liquidity/working capital management efficiency, solvency management efficiency, profitability, operating surplus to


investment and liquidity and solvency cushion criteria. It was concluded that sustained growth in primary output of food commodities was essential for higher growth performance of the chosen food processing industries. Food processing industries were prioritised on the basis of efficiency in resource use and profitability, based on different criteria for different sets of data. Liquidity and solvency management and liquidity and solvency cushion management for various food processing industries were compared.

Mani and Sathyanarayana attempted to study production function in sugar industry in a backward region with special reference to Chittoor Co-operative Sugars Limited, Chittor, and Andhara Pradesh. The data was collected directly from the office records of Chittoor Co-operatives Limited, Chittoor, for the period 1964-65 to 1984-85. The constant elasticity of supply (CES), the variable elasticity of supply (VES) and the Cobb-Douglas production function were fitted to the data to examine their relative importance. The data was also used to estimate the elasticity’s of output and the returns to scale in addition to computing the marginal productivity’s of the factors. It was concluded that the Cobb-Douglas production function was more suitable for the study. Chittoor Co-operative Sugars Limited was found to have zero neutral technical progress and that it was operating under constant returns to scale. It was further concluded that labour was relatively a more important factor than capital in terms of factor elasticity of output and

marginal factor productivity. Contribution of capital was found to be stable in comparison with contribution of labour if relative contribution of factors to mean value added is analysed.

Desai and Namboodiri\textsuperscript{21} analysed development and financial performance with special reference to working capital management of selected food processing industries, food grains milling, edible oil seeds processing, sugar cane processing and milk processing. The data was drawn from three sources i.e., Annual Survey of Industries, small scale sample survey data and the data from unit level case studies. Three or five year’s averages were utilised because industries under study were subject to fluctuations on account of their dependence on agriculture for their raw material. Four criteria’s were used for this analysis. Results on each of the four criteria were discussed first and then all the four criteria were simultaneously applied. Prioritisation among the selected food processing industries were derived on the basis of simple rank each industry obtained for the criteria under study. It was concluded that these industries must be located in rural areas so as to have direct access to various inputs of these industries. It was further said that the public and private investment for modernisation of processing technology must be encouraged.

Sinha & Sinha\textsuperscript{22} studied the growth of the industry, analysed the constraints and opportunities, reviewed the prospects. The data was taken from Annual Survey of Industries, ministry of food processing industry and ministry of food and civil supplies. It was seen that productive capacity has grown rapidly at over 13 per cent per annum. Major portion of the output was contributed by the organised sector. It was further concluded that the factor impeding the industry growth is mutually interred related. Five main constraints i.e., poor horticultural base, weak production system, market limitations, consumer preference and government policy were identified. In the end it was said that to grow three major developments i.e., link between agriculture and industry, recognition by government and a convergence between the felt needs of consumer are essential.

Conner and Peterson\textsuperscript{23} estimated the relationships between market structure and the learner index of monopoly constructed from price data on processed food products sold through grocery stores. A theoretical model of a differentiated oligopoly specified two determinants of price -cost margins: the Herfindahl - Hirshman index of seller concentration adjusted for the elasticity of demand and the industry advertising -to-sales ratio. It was concluded from the analysis that the three principal determinants of price-cost margin


variation, in order of their impacts were advertising intensity, elasticity of demand and concentration.

Singh\textsuperscript{24} analysed the capacity utilisation, size and problems faced by secondary food processing units. Suggestions to government as well as existing secondary food processing units to improve performance were also given. The scope of the study was restricted to districts of Jullandhar, Ropar and Union Territory Chandigarh. The stratified sampling technique was used and a questionnaire was developed to obtain the various details about the units. It was concluded that despite the encouraging performance rate and trends, the fact remained that the industry had not reached anywhere near its true potential. It was further concluded that the investment does not play a very important role in the development of food processing industry. Various problems faced by the industry were listed.

Patel\textsuperscript{25} brought out different aspects of agro based industries in India. The classification of industries was made on the value added basis. Various ratios and growth rates of different industries were calculated. It was concluded that a substantial portion of industrial activity was being undertaken in the unorganised sector. It was further concluded that the agro-based industries assume a critical place in the development potential of the national economy of India.

\textsuperscript{24} Singh, Gurinder. A Market Study of Existing Food Processing Industry for Nitcon Ltd, MBA, Punjabi University, 1992.

Grover & Grewal\textsuperscript{26} have highlighted the problems of sugar industry in India. More or less this study was confined to the area of Punjab. It was seen that the quantity of sugarcane crushed by the Phagwara, Batala and Morinda Sugar factories declined to a level of less than half during 1966-67, 1971-72 and 1979-80 when compared to the preceding year. The operational efficiency of the sugar mills was worked out as percentage of net working days to the gross working days. Performance of selected mills was studied on the basis of several efficiency criteria such as cane crushed, mechanical breakdowns, operational efficiency and capacity utilisation.

Wann and Sexton\textsuperscript{27} attempted to improve understanding of market behaviour in food processing by developing and estimating a generalised model of farm retail price spread determination that show structural characteristics of agricultural markets. This model was applied on California pear processing industry. Oligopoly power in the other processed product markets is estimated by comparing the margin for these products with the margin for the benchmark product. The main aim of the present study was to extend the methodologies described above to analyse market power simultaneously in multiple processed product and raw-product markets and to apply the new methodology to the pear industry. Data for 1950-1986 were obtained from many sources. Touche Ross & Co. study was used as a major


\textsuperscript{27} Wann, Joyce J. and Sexton, Richard J. “Imperfect Competition in Multi Product Food Industries with Application to Pear Processing”, American Journal of Agricultural Economics, Nov. 1992, pp 980-990.
source for the processing cost. It was concluded that prices in canned pear and fruit cocktail markets showed a moderate price enhancement. The hypothesis of competition in the raw pear input market was rejected.

Frank and Henderson\textsuperscript{28} developed a vertical co-ordination measure that incorporates product flow linkages and co-ordinating methods utilised between vertically interdependent industries. The hypothesis, which was tested, is that the food industries use various vertical co-ordination arrangements and are motivated by transactional inefficiencies. Two components i.e., inter industry linkages and co-ordination methods for these linkages were used for calculating the vertical co-ordination. Five co-ordinating methods were used and data on farm sector down stream contracting was used. Using 1982 data 42 four digit SIC food manufacturing industries were analysed. It was concluded that transaction costs were a primary motivation for vertically co-ordinating via non-market arrangements. It was also suggested that the vertical co-ordination index was more robust than traditional vertical integration measure.

Durham and Sexton\textsuperscript{29} developed an empirical model to analyse the potential for exercise of monopsony power in food markets. The model was applied to processing tomato industry in California. The approach was based on estimation of residual supply functions facing a group of processors. A


three step procedure was utilised to estimate the residual supply functions facing each of the six processor groups. It was concluded that market power potential in the California processing tomato market was limited. It was further seen that rivalry between neighbouring markets was adequate to make them quite competitive. So inter regional competition in today’s processing tomato industry was more extensive than it was 15 years ago.

In this article it was observed that despite some spectacular flops in the processed food market, the industry was poised for a take off. A recent survey assessed the scenario and the business potential for new entrants. This article was based on the study conducted in 1989 by Marketing and Business Associates (MBA) and it presented a broad perspective of the Indian market for processed foods. It dealt with individual product categories giving an idea of market size, key player and other revealed market characteristics.

Vellaichamy took northeastern region as the scope of this study. The northeastern region comprising of seven states Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura is full of hills and rivers valleys. The constraints, which were faced in this study, were cultural practices, infrastructural limitations, and seasonality of raw material packing limitations. Prospects of food processing industry were projected as bright in northeastern region if proper attention was paid. Level of utilization of fruits

and vegetables for processing purpose was estimated to be around 2 per cent of the total production of 40 lacs. 1/5th of the production was lost during post-harvest handling. The existing units, except in a case, utilized machinery’s which were obsolete and capable of uneconomic turnover. They required modernization and trained manpower for post-harvest handling and processing.

Potty 32 studied the status of agro-processing industry in India. It was said that due to huge population rise the food need was increasing rapidly. So the need of agro-processing industry was felt because it would be important to concentrate attention on post harvest technologies and handling of produce. The agro food processing sector has also been making an important contribution to the country's exports. It was clearly emphasised that agro-processing industries were helpful for rural development, development of women, tribal development. In case of developed nations 80-85 per cent of food raw materials undergoes some degree of processing before reaching the consumer. Generally food industries account for 25 per cent of total industrial employment in developed nations where as food industry account for 35 per cent of the total industrial employment in developing nations. It was seen that the economic progress of a nation was directly proportional to the effective utilisation of science and technology. Research and Development was considered essential for food industry. Man power was also required and the

facilities must be made available to give them training. There are various organisations which should be able to contribute to an accelerated pace of technology transfer. In nutshell it was said that food processing industry in India has got huge potential for development.

Adsule\textsuperscript{33} studied the status of small scale food processing industry. According to this report, growth rate at constant prices for reserved food product units was registered at 13.2 per cent and for the non-reserved at 10.7 per cent while the growth rate at current prices was stated to be 18.45 per cent and 17.47 per cent for reserved and non reserved units respectively. It was felt that there is tremendous scope to modernise these operations, but this sector has not received adequate attention of concerned authorities to obtain quality bakery products, which were now being consumed by all the segments of population in the country.

Govindas\textsuperscript{34} emphasized that in the field of food products number of organizations formulate the standards and control the quality. Basically, two systems, firstly, compulsory legislation which ensure the minimum requirements of health and safety, and secondly, the system of voluntary standards and certification which indicate superior codes of quality along with a third party guarantee mark and the most important compulsory legislation in our country in the area of food is the prevention of Food Adulteration Act,

\textsuperscript{33} Adsule, Dr. P.G., "States of Small Scale Food Industries in India", National Symposium on FPI, New Delhi, Feb., 1993.

\textsuperscript{34} Govindas, A., "Role of BIS in Standardisation and Certification of Food Products", National Symposium on FPI, New Delhi, Feb. 1993.
which was enacted in 1954. This being the most basic statute protects the common consumer against supply of adulterated foods. In addition to the above statute, a number of control orders were have been formulated under the provisions of the essential commodities Act 1954, whose main objectives were to regulate the manufacture, commerce and distribution of various essential commodities including food. Another important regulation which applies to all commodities sold in the packed form is the standards of weights and measures rules 1977 which lays down certain obligatory conditions with respect to quantity declarations of packaged products. He said that in the area of food, two organizations deal with the voluntary standardization and certification system. BIS, which is looking after standardization of processed foods and Directorate of Marketing and Inspection looking after standardization of raw agricultural produce. The BIS, the national standards organization of India, was on the job of preparing national standards for the entire gamut of agriculture and food sectors. BIS was established with effect from 1 April 1987 subsequent to the passage of BIS Act 1986. The main functions listed down of the Bureau were to formulate Indian standards for articles and processes and promoting their implementation, to operate certification schemes, to establish, maintain and recognize laboratories for the purpose of standardization and quality control to undertake research for formulation of Indian standards. To evolve Indian standards in a very systematic manner, the sectional committees comprising of exports drawn from industry, technologist, educational institution, research and testing
organization, consumer bodies and government officials connected with this field are selected to formulate Indian standards in a particular area. In the food sector, the emphasis is not only on the quality parameters but also on the stipulation of necessary safety measures against health risks on account of contaminants and harmful additives, apart from freedom from toxic agents like aflatoxin and gossypol. The Bureau operates a certification marks scheme under the BIS Act 1986. The BIS standard mark on an article certified that the article complies with a particular Indian standard and also guarantees that the manufacturer operates a quality control scheme in his production on a continued basis. The certification marks scheme provides an in-built mechanism for ensuring the quality of the products.

Susanta K. Roy35 stressed that India is one of the horticultural rich countries of the world. It produces about 8 per cent and 12 per cent of the world's production of fruits and vegetables respectively. Among the horticultural crop, the fruits and vegetables available in India were highly inadequate to meet the basic requirements of the country. Moreover the quantities of fruits and vegetables used by the food processing industries and export trade were also highly inadequate. The main reason for this is the huge post harvest loss due to inadequate post harvest management. It was concluded that research efforts are necessary to develop new technologies to cut down losses. It is also necessary to transfer the technology developed to

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the user agencies. This paper dealt with the recent past in the field of post harvest technology of horticultural crops and priorities which lie before us. Research was done in case of pre harvesting, handling, storage, processing, waste utilization etc. There was a great need to take up research projects to boost our export market without neglecting the domestic demand. India has vast resources of indigenous horticultural produce, which have established therapeutic value apart from having high attractive value, attracted colour and excellent flavor. In India there is an absolute lack of the concept of establishing packing stations. A great emphasis is required to be given on low cost technique of preservation of fruits and vegetables in particular in order to control vitamin A deficiency. We should lay a great emphasis on human resource development in post harvest technology. It is not possible to eliminate the post harvest loss totally but we can make an effort to reduce the loss rate by better post harvest management by making an intensive effort. If we are able to successfully reduce the loss rate by the end of this century, we may hope to get surplus horticultural produce after meeting the requirements of the population. It is necessary to have multi-disciplinary and multi-institutional approach to solve the post harvest problems of the country.

Chadha\textsuperscript{36} stressed that in order to increase 'repeat buys' the manufacturer must identify consumers' requirements, characteristics or attributes. This combination of attributes/characteristics that contribute to its

acceptability, is defined as quality. Quality is defined as the totality of features and characteristics of a product or service that bears on its ability to satisfy or implied needs. Quality control involves operational techniques and activities to fulfil quality requirement. Its objective is maintenance of specified finished product characteristics every time it is manufactured. It was concluded that total quality control needs efficient co-ordination, synchronization and integration of all organizational activities. It involves good interpersonal relations who can resolve problems before they grow bigger and more complex. Special attention should be given to train the personnel in efficient quality monitoring and developing quality manual. It was said that the success of QC system depends on the commitment of top management and support. Inspection should never be equated with quality control. Quality control should be viewed as integrated function of different activities planning, prevention and monitoring. ISO 9000 prescribed how to go about making sure that a supplier has capabilities of meeting specific requirements of a standard. ISO 9001 is that model for quality assurance in design/development, production, installation and servicing. It is one of the standards dealing with quality system used for external quality assurance purposes. The quality manual is one of the important documents in the quality management. It was felt that the purpose of the quality manual is to provide a point of reference for the implementation and maintenance of quality management system.
Naik\textsuperscript{37} studied that the diverse agro climatic conditions prevalent in the country are suitable for growing all types of fruits and vegetables. But these products are perishable. The fruits and vegetables processing industries can help avoid post harvest wastage of these products. The author discussed in this paper the constraints and suggestions for the growth of processed food industries. World trade in processed fruits and vegetables is continuously increasing. Present international trade is around US $ 5 billion consisting largely of juices, concentrates, pastes etc. The main exports were to the Middle East countries where the market is always uncertain.

Major constraints and suggestions include leasing of land to entrepreneurs for captive cultivation, reduction of post harvest losses on fruits and vegetables through proper management, improving the productivity of land, duty free imports of F.P.I., lack of research and development efforts, harassment under food laws, market promotion, single window clearance. These constraints should be removed to capture the potential of FPI.

NITCON\textsuperscript{38} in this report reviewed the present status of food processing industry, infrastructural facilities, assessed the demand of selected food-based products and identified the viability of various projects. The data was collected from primary and secondary sources, and in case where data was not available from primary and secondary sources, efforts were made to generate the requisite data through primary surveys and references to experts and


\textsuperscript{38} NITCON, Status and Potential of Food Processing Industries in Punjab, March 1993.
prominent persons in the concerned activities. On the basis of the above data and methodology, various problems of the existing units were laid down. It was concluded that the government, research institution, financial institutions and various development agencies and individual entrepreneurs must take that suggested steps for promoting food processing industries in the state.

Kodamarami & Suresh\textsuperscript{39} analysed the Sugar Industry in Chittoor district of Andhara Pradesh using the production function approach. Empirical estimates to various measures like average productivity’s, marginal productivity’s, return to scale and factor’s relative contribution to the output was provided in this study. The study concluded that the concept of gross output was the one that should be used in the production function, and the raw material was found to be an important factor of production in terms of elasticity in all three cases.

Shampakar and Anuradha Paul\textsuperscript{40} observed that till recently, food processing was not a priority for Indian corporate planners. Moreover the climate was not so encouraging as companies were hamstrung with excise duties, sales tax and lack of infrastructure but, it appeared that the government is resolved to develop this industry, and that's making all the difference. It was further said that food processing industries have to face a lot of problems

\textsuperscript{40} Shampakar & Paul Anuradha., “A late Sunrise - Food Processing”, Business India, May 24 - June 6, 1993.
and also that multinational companies had not tapped the Indian market completely.

Subramanian discussed the status and problems of the seafood processing industry in Karnataka. The seafood processing industry in Karnataka consists of 4 important groups i.e., shrimp freezing, fish canning, fish meal and oil and curing and drying of fish. It was said that this is an important export oriented industry of the region. It was seen that the processing facilities of the federation were not properly utilised. Those units were facing many problems, which need to be looked into. Another group is fish canning, fish meal and oil and curing and drying of fish.

Gulati, Sharma, Das and Chabra studied the competitiveness of India in the production of various commodities over other countries. Nominal protection coefficient was used to measure the level and nature of competitiveness. For the purpose of this study 17 agricultural commodities were selected. Empirical analysis was carried out to highlight the complexities of each commodity with a view to boost its exports. It was concluded that out of cereal group, rice was highly competitive crop of India. In case of processed fruit and vegetable items in the study it was revealed that severe infrastructural problems such as lack of cold storage facilities prevented the processing sector from taking off both in the domestic market


and in the world market. In order to boost the export it was thought pertinent to remove the obstacles through appropriate strategy. It was further felt that export controls and regulations must be abolished and long term investments in research must be done.

The article gives the results of the poll conducted by the Economic Times in which list of top 12 food processing companies was given and top 7 factors were given which determine choice of a company in this sector for investment purposes. Also the reasons for high returns, reasons for average returns and reasons for very high returns in export oriented companies were given.

Shergill and Singh studied the scope of agro processing industries in Punjab and identified two groups of agro processing units with very good and good scope of development in Punjab. This was done keeping in view the availability of raw material, backward and forward linkages, growth and performance etc. Few industries like dairy products, bakery products, animal feed, liquor malt and malt products, cotton, textile, woollen, leather, paper, meat etc were regarded as agro processing units with very good scope of development in Punjab. Various suggestions given to improve the working were to build the confidence of the investors, for perishable goods, trading houses combining the operations of procurement, processing and marketing

\[43 \text{ "There's a lot to chew here". The Economic Times, Aug. 1994.} \]
\[44 \text{ Shergill, H.S. & Gurmail Singh. Agro - Processing Industries in Punjab, Mimoo., Institute of Communication and Development, Chandigarh. 1994.} \]
need to be promoted. Further contract farming must be encouraged for hedging the risk of processors and decreasing the risk of farmers as well.

Goodwine and Brester\textsuperscript{45} studied structural changes in factor demand relationship for labour, capital, raw material and other inputs for U.S. food products industry. Moreover, the tests for structural changes were also made. Bayesian inferential procedures within the context of a multivariate gradual switching system was used. The translog factor demand system was used to study input demand relationships. Quarterly data for the total cost of producing all products in the food and kindred products were obtained from quarterly financial reports. Employment data was obtained from the Survey of Current Business and cost of depreciation, depletion and amortisation of property, plant and equipment was collected from quarterly financial reports. Annual fuel and power expenditures were converted into quarterly data on the basis of quarterly industrial electricity usage for all industries. Significant structural change was indicated in the food industry. It was concluded that the demand for labour was less elastic as compared to demand for food materials, energy etc. During 1980's there was a significant increase in labour/capital and labour material price ratios, new technologies for processing and manufacturing food items. Employment in the industry had reduced. It was further concluded that the structural shifts reflect new food packaging and preparation technologies.

Lanclos and Herter\textsuperscript{46} analysed the effects of tariffs on intermediate inputs and final goods in monopolistically competitive industries. They developed a framework for the analysis of product differentiation where tariffs were applied to both traded inputs and final products. For this analysis illustrations were provided for selected industries in the U.S. food processing sector and the results were compared with results under perfect competition. In order to assess these effects Venables model of monopolistic competition was constructed. Results were shown in the form of log differential form. It was seen that the output per firm declined in response to a tariff on intermediate inputs. When the results were compared to perfect competition it was found that the decline in total industry output was much larger under monopolistic competition. It was further concluded that as the market share of home firms in the domestic market, approached one, however the cost structure effect dominated as foreign competition in the home market was eliminated.

Huang and Sexton\textsuperscript{47} developed and applied a conceptual framework to evaluate the impacts of a cost reducing innovation in an imperfectly competitive market for an agricultural product. It was seen that the industry is imperfectly competitive both in raw product procurement and domestic


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product sales. It was concluded that there is potential of mechanical harvesting to reduce processing tomato per unit production cost from 12% to 45%.

In this article a survey on the food processing industry was done by business standard and various crucial issues of food processing industry were revealed. It was said that food processing was one of India’s most under-exploited opportunities. Both private initiative and government policy could go a long way towards turning it into a booming business. The graving issue, then is one of outlook, both on the part of the government and the industry. Kito de Boer. Principal, Mckinsey in India, said the industry could grow if the players think big. It is counter productive to stop people from getting big and enforce companies to be stunted scale industries.” He said that poultry could become a fast growing business but only if the industry was able to hatch itself out of the current small-scale focus. By 2005, Mckinsey expected poultry to emerge as a Rs. 27000 crore industry.

Companies were making cautious forays into value added grain processing. Only the cost conscious could earn good yields. To provide quality snacks, the organized sector had to cope not only with higher production costs but also with the local halwai. Fruit and vegetable were good examples of the under-exploited nature of the food processing industry in India. The lack of an efficient cold chain system and government policy was

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combined to take the bite out of the food processing industry. Multinational food processing companies like to develop direct supply linkages with producers.

Sandip conducted an all India level study analysed the agro-industry and inter-relationship between agro-industry and agriculture. It explained the growth of agro-industry in terms of its relationship with agriculture. The data was collected from Annual Survey of Industries and National Sample Survey. It was indicated that within the agricultural sector only plantation and commercial crops get substantially processed by agro-industry. Within agro industries, oil seed processing, sugar cane processing had strong backward linkages. The regression analysis showed that the growth in linkage coefficient and the growth of raw material supply affected growth of agro-industries in positive manner, whereas, greater concentration of raw material availability influenced growth of agro industry in negative fashion.

An overall view of the literature indicates that most of the researchers have studied various industries coming under the broad category of food processing industry and not food processing industry as a whole. This calls for a systematic approach to the study of growth and prospects of food processing industry. For choosing the methodology for the present study, the merits and demerits of the above studies have been kept in mind. Thus, the above review of studies provide a base for the present study.