Chapter-7
Conclusions and Suggestions

Punjab has achieved remarkable growth since independence and is now one of the richest States of India. It is one of the few States in India in which rapid agricultural growth has induced rapid industrialisation. This growth and prosperity is primarily the result of Punjab’s adoption of latest technology in agriculture during 1960s. Its cultivators were the first to adopt the Borlaug seed-fertilizer technology during the mid-1960s, and within a few years the State became the symbol of green revolution in India.

The locally available agricultural raw materials, e.g., cotton, paddy, milk, fruits and vegetables and poultry provide a rich input base for the major agro-based industries in Punjab such as cotton textiles, food processing including modern rice mills and dairy industry. Besides enhancing the income opportunities in the farm sector, these linkages encourage agricultural diversification and lead to a more balanced use of land and water resources.

Agro-based industries develop on the basis of agriculture-industry interrelations. Agriculture and industry are integral components of the development process due to their mutual relationship. As agriculture provides inputs to the industry and output of the industry is used in agriculture to expand production. There are many industries which are based on agricultural output. Agro-based industries can be dependent upon agriculture for their raw-material and other basic inputs. The concept of agro-industries is quite old but the term has acquired new significance in recent years in the wake of growing need of inter-dependence between agriculture and industry and the modernisation of the former. This inter-dependence must be oriented to suit the need of our country and the State.

Thus, agro-based industries can be broadly defined as those industries that are dependent upon agriculture for their raw material and other basic inputs. As agriculture provides inputs to the industry and output of the industry is used in agriculture to increase agricultural production.

Agro-based industries may be classified into two categories; namely food processing industries and non-food processing industries. The food processing industries mainly involved in the preservation of perishable products and utilisation of by-products for other purposes. These types of industries include the processing of wheat, rice, maize,
barley, pulses, meat, fruits, vegetables, etc. Non-food processing industries mainly satisfy the need for shelter and clothing. These industries produce such items as wool, cotton, rubber, leather, etc.

This study analyses the success of industrialisation in the context of dependence of industrialisation not only on the capability of agriculture to generate surpluses but also on whether and how these surpluses could be channelled into industrial development. The development of agro-based industries is considered as hub of industrialisation and in this respect industrialisation is a process of economic development in which a growing part of national resources is mobilised to develop a technically up-to-date diversified domestic economic structure characterised by a dynamic agro-based sector having and producing material for production and consumer goods. As a result, it becomes capable of assuring a high rate of growth for the economy as a whole and achieving social as well as economic progress.

The population of India is increasing at a considerably higher rate and this leads towards the significant increase in the labour-force. The avenues of employment for this labour-force are one of the serious concerns. In this situation, the establishment and development of agro-industries is a keystone to nation’s economic and social development and is one of the solutions to unemployment problem. Punjab is agriculturally developed State and economic growth in Punjab has been closely associated with the well-known ‘Green Revolution’ and the future development lies in rapid industrialisation. Both sectors, i.e., agriculture and industry can play an important role in the overall development of the State economy.

In the modern times, industrialisation in Punjab is assuming alarming proportions. There is a necessity for setting up appropriate agro-based industries in Punjab. For this purpose, there is a need to examine the performance of agro-based industries in the context of number of units, fixed investment, generation of employment opportunities and production etc. Thus the development of agro-based industries in Punjab and the problems and prospects of these industries should be analysed. Therefore, the present study is a modest attempt to analyse the patterns and growth of agro-based industries in Punjab.

The objectives of present study are to examine the pattern, growth and importance of agro-based industries and to identify the problems and prospects of development of
agro-based industries as well as to suggest policy measures for the development of agro-based industries in Punjab.

The cropping pattern of Punjab has changed a lot during the last five decades. Before green revolution the dominant crops were wheat, maize, cotton, pulses, oilseeds and sugarcane that occupied a major portion of gross cropped area. But after green revolution these crops except wheat, sugarcane and cotton have lost their importance. After the 1980’s, the crops which occupy the major portion of cropped area are wheat and rice. The percentage of area under these two crops in the State has increased from 59.06 per cent in 1980-81 to 72.33 per cent in 1993-94 and further to 77.65 per cent in 2005-06. The area under rice increased tremendously after the introduction of dwarf IRRI rice varieties in early seventies. Thus, wheat and rice are the most pre-dominant crops in the State. Other important crop in Punjab is cotton but this is confined to the south and south-west areas of the State. The area under cotton as a ratio of gross cropped area was 9.59 per cent in 1980-81 and increased to 10.28 per cent in 1991-92 and then decreased to 7.07 per cent in 2005-06. The yearly fluctuations in area and production were the result of changing agro-climatic conditions and variations in market prices.

Total area under cereals increased from 4513 thousand hectares in 1980-81 to 5548 thousand hectares in 1991-92 and further to 6286 thousand hectares in 2005-06. The production of cereals increased from 11717 thousand metric tons in 1980-81 to 25635 thousand metric tons in 2004-05 but in the year 2005-06, it decreased to 25157 thousand metric tons. The area under all foodgrain crops increased from 4854 thousand hectares in 1980-81 to 6316 thousand hectares in 2005-06 and the production of total foodgrains increased from 11921 thousand metric tones to 25180 thousand metric tons respectively.

In 1980-81, the highest area under rice was recorded by Amritsar district followed by Patiala district whereas the production of rice was highest in Patiala district followed by Firozepur district. For Punjab as a whole, the production of rice increased 1.42 times during the period 1992-93 to 2005-06. The districts that emerged in later time period have recorded relatively better results for rice cultivation. The area under rice crop was highest in Sangrur district and as a result this district registered highest production of rice in 2005-06. For Punjab as a whole, the area under rice was 2642 thousand hectares and the production of rice was 10193 thousand metric tones (3.85 times than area) and per hectare yield of rice was 3858 kg in 2005-06. During the whole time period of the study,
Bathinda district accounted for highest growth rate in area and production, i.e., 9.98 and 10.61 per cent per annum respectively. The lowest growth rate of area and production of rice was registered by Faridkot and Fatehgarh Sahib districts. The above discussion reveals that there is bright future for agro-food-based industries in Punjab.

Wheat is a major cereal crop grown in Punjab State. The total area under wheat has increased from 2811 thousand hectares in 1980-81 to 3468 thousand hectares in 2005-06 and production of wheat has increased from 7674 thousand metric tons to 14493 thousand metric tons respectively. The production was highest in Sangrur district over the time period, so more market arrivals of this crop came in Punjab from this district. The area, production and yield of wheat and rice crops increased with the passage of time in all the districts of Punjab. During 1980-81 to 2005-06, the overall growth rate of area of wheat was 0.81 per cent per annum and the production growth rate of this crop was 2.47 per cent per annum. The highest growth rate of area and production was recorded in Nawan Sehar district whereas, the lowest growth rate has been registered in Bathinda district. The highest growth rate of production under this crop was the result of more area covered by this crop in Punjab.

Only two main crops, i.e., wheat and rice showed the positive growth rate of area and production for all the time period. These two crops are the major cereal crops grown in Punjab. It is observed that the production of wheat and rice is expected to go up substantially in the near future, whereas the production of cotton and sugarcane will increase marginally, but in case of potato, maize, barley and gram, the production is expected to decline further in the coming years. As expected the decrease in area under these crops may be attributed to the absence of the technological improvements and ineffective price policy for these crops in the State.

Market arrivals of paddy are more than that of the wheat both in absolute and in relative terms. In the year 2005-06, the percentage share of total arrivals of paddy was highest in Sangrur district (17.80 per cent) followed by Ludhiana district (12.20 per cent), Patiala district (10.80 per cent) and Firozpur district (9.40 per cent). These four districts contributed about 50 per cent of total market arrivals of paddy in Punjab mainly due to suitable land for cultivation of paddy, increase in area under cultivation of paddy, availability of labour etc. The percentage share of market arrivals of paddy was lowest in Hoshiarpur district (1.50 per cent) followed by Rupnagar district (1.82 per cent), Mansa
district (3.20 per cent) and Faridkot district (3.26 per cent). These four districts contributed only about 10 per cent of total market arrivals of paddy in Punjab. In the nutshell, it may be concluded that the continuous increase in the marketed surplus (or market arrivals) shows the development of the Punjab economy. The total arrivals of wheat in Punjab was 4192 thousand tones in 1981-82 and then rose to 9255 thousand tones in the year 2005-06.

Punjab State is producing surplus quantity of farm products like wheat, paddy, guava, cotton, ber, potato, sugarcane and milk etc. Although it has small geographical area yet it is producing more agricultural production. If the surplus of these agricultural products is used within the State, there is more income through various forward and backward linkages. It is possible only with the development of agro-based industries in the State. The establishment of more agro-industries at a higher pace can ensure a ready market for the suitable use of surplus foodgrains produced by the farmers.

The analysis of small-scale agro-based industries reveals that the percentage share of food, beverages and tobacco-based industries as well as wood, paper and leather-based industries has increased whereas the percentage share of textile-based industries has decreased over the period of time with minor fluctuations in between. During 1980-81 to 2005-06, the growth rate of number of units was highest in case of food, beverages and tobacco-based industries (7.72 per cent per annum) followed by textile-based industries (6.39 per cent per annum) and lowest among wood, paper and leather-based industries (5.93 per cent per annum). The possible reason could be that due to the adoption of modern agricultural inputs like chemical fertilisers, pesticides, machinery — tractors, diesel engines, harvest combines, implements and irrigation pumps, agricultural production increases resulting in increased marketable surplus leading to the development of agro-based industries.

The growth rate of fixed capital was highest in the textile-based industries, i.e., 7.30 per cent per annum followed by wood, paper and leather-based industry which registered the growth rate of fixed capital, i.e., 6.38 per cent per annum whereas the food, beverages and tobacco-based industries registered the lowest growth rate of fixed capital, i.e., 6.03 per cent per annum. During the overall reference period, the growth rate of fixed investment in these industries was 6.27 per cent per annum for Punjab.
The textile-based industry was also one of the largest employment provider industry and accounted of almost 40 per cent of industrial employment in 2005-06. It provides employment opportunity to semi-literate and lower sections of the society where the incidence of unemployment is the most glaring. Most importantly the textile sector is one of the biggest employment providing sector to women, a highly neglected section of the society. Hence any boost to textile industry will definitely create large employment opportunities for the masses in the State of Punjab. However, the growth rate of employment between 1980-81 to 2005-06 shows that the growth rate of employment was lowest among textile-based industries (4.07 per cent per annum) while it was the highest (6.79 per cent per annum) in food, beverages and tobacco-based industries followed by wood, paper and leather-based industries (6.00 per cent per annum).

During eighties, the growth rate of output was highest (9.94 per cent per annum) in food, beverages and tobacco-based industries followed by textile-based industries (6.65 per cent per annum) and the lowest among wood, paper and leather-based industries (4.88 per cent per annum). Since nineties, textile industries witnessed the highest growth rate of output. Between 1980-81 to 2005-06, the growth rate of output was highest for textile-based industries (10.80 per cent per annum) followed by food, beverages and tobacco-based industries (6.82 per cent per annum) and lowest among wood, paper and leather-based industries (4.25 per cent per annum).

The analysis of large-scale agro-based industries reveals that the number of units of food, beverages and tobacco-based industries and textile-based industries was more as compared to the wood, paper and leather-based industries over the time period. The percentage share of total fixed investment in food, beverages and tobacco-based industries decreased whereas in case of textile-based industries it increased over a time period with minor fluctuations in between. But for wood, paper and leather-based industries it was almost more or less same, i.e., it slightly increased from 7.57 per cent in 1980-81 to 8.95 percent in 2005-06. The percentage share of fixed capital in textile-based industries as well as wood, paper and leather-based industries had increased upto the period of 1987-88, but in case of food, beverages and tobacco-based industries had decreased with some fluctuations over a period of time. The high concentration of fixed capital was observed in textile-based industries. It is clear that there were large number of units of textile industries in Punjab. During 1980-81 to 2005-06, textile-based industries
showed the highest growth rate for fixed capital (13.69 per cent per annum) followed by food, beverages and tobacco products industry (10.85 per cent per annum) and wood, paper and leather-based industries (10.72 per cent per annum). The share of employment in large-scale textile-based industries was highest followed by food, beverages and tobacco-based industries and lowest among wood, paper and leather-based industries over the time period. The above discussion clearly depicts that there were large number of food and textile-based industries and they generated more employment opportunities in Punjab. The percentage share of output of food, beverages and tobacco-based industry has decreased whereas the percentage share of output of wood, paper and leather and textile-based industries has increased over the time period with minor fluctuations in between. During the period 1980-81 to 2005-06, wood, paper and leather based-industries has contributed the highest growth rate for output (13.21 per cent per annum) followed by textile-based industries (9.29 per cent per annum) and the lowest by food, beverages and tobacco-based industries (6.70 per cent per annum).

The food, beverages and tobacco-based industries are one of the most important industries in Punjab. The number of food, beverages and tobacco-based industries increased from 1001 in 1980-81 to 4680 in 2005-06 in the urban areas (more than four times) whereas the total number of these units increased from 476 in 1980-81 to 5475 in 2005-06 (more than eleven times) in rural areas of Punjab. This study reveals that percentage share of food, beverages and tobacco-based industries has declined in the urban areas whereas it has been rising continuously in the rural areas over the period of time. One of the reasons of concentration of agro-based industries in the rural areas was easy availability of agricultural raw-material and other inputs as compared to the urban areas. In 1980-81, majority of industries were concentrated in urban areas of the State but with the passage of time, the total number of industries has increased in the rural areas mainly due to increase in agriculture production and productivity, availability of raw-material and labour as well as government efforts and special packages for establishing industries in the rural areas for reducing regional disparities.

The textile-based industries were mainly concentrated in the urban areas of Punjab. The number of textile manufacturing units increased from 3212 in 1980-81 to 11697 in 2005-06 in the urban areas by registering growth rate of 5.06 per cent per annum during this period whereas, the number of units of textile industry was 95 in 1980-
and these increased to 3246 in the year 2005-06 in the rural areas. The growth rate of number of textile industrial units was greater (14.55 per cent per annum) in the rural areas as compared to the urban area (5.09 per cent per annum) and at the State level textile industry registered 5.97 per cent per annum growth rate of number of units.

The district-wise analysis reveals that the total number of units of food, beverages and tobacco-based industries has increased in the rural and urban areas of all the districts of Punjab during 1980-81 to 2005-06 except Faridkot district where total number of units decreased in the urban areas. In the year 1980-81, the highest share of the number of units of food, beverages and tobacco-based industries was in the urban areas of Amritsar district followed by Faridkot and Ludhiana districts. In the rural areas of Punjab, the concentration of food, beverages and tobacco-based industries was highest in Amritsar district, i.e., 24.60 per cent of the total rural units in 1980-81. With the passage of time, the share of food, beverages and tobacco-based industries in the total number of industrial units has declined. The reason behind the decline in number of units of food, beverages and tobacco-based industries is that the growth of number of units in textile-based industries as well as wood, paper and leather-based industries was relatively much higher during this period. The districts that came into existence after 1991 have very low share in the agro-food products industry.

The analysis at the district level shows that the rural areas registered the highest growth rate during 1980-81 to 2005-06. The concentration of more industries in the rural areas was mainly due to easy availability of agricultural raw-material and other inputs as compared to the urban areas. In the year 1980-81, the highest share of fixed capital in total fixed capital was in Jalandhar district followed by Firozpur district. The lowest share in food, beverages and tobacco-based industries was recorded in the rural and urban areas of Bathinda district.

In the rural areas, the districts that grew at faster pace showed better results in terms of growth in number of units, fixed capital and generated more employment in relative terms. At the State level, the share of output of food, beverages and tobacco-based industries in the rural areas was continuously increasing. So, it is better for the development of Punjab that more rural agro-based industries should be established. The factors responsible for the declining share of food, beverages and tobacco-based industries in Punjab in the eighties are liberalisation of industrial sector leading to
increased competition from the large firms and drought in the State. It is clear from the analysis that some districts have shown exceptional performance while others have dismal performance during 1980-81 to 2005-06. During early 1980’s the largest employment in food, beverages and tobacco-based industries was generated in Faridkot district followed by Gurdaspur, Sangrur and Jalandhar districts. The percentage share of employment in Bathinda district was lowest in Punjab in this industrial group.

The share of output of food, beverages and tobacco-based industries was continuously increasing in the rural areas. In absolute terms, the value of total output in this industrial group has increased from Rs.19829.3 lakh in 1980-81 to Rs.92238.80 lakh in 2005-06 in the urban areas by recording a growth rate of 6.09 per cent per annum. In rural areas, the value of output increased from Rs.12201.78 lakh to Rs.154687.81 lakh by registering 10.26 per cent per annum growth rate during the same period. The above analysis establishes the fact that the pattern of food, beverages and tobacco-based industries had relatively a high pace of growth in the rural areas.

The district-wise analysis shows that the total number of units of textile-based industries increased in the urban as well as rural areas during 1980-81 to 2005-06. The percentage share of these industries has declined in the urban areas whereas increased in the rural areas of all the districts of Punjab. In 1980-81, out of the total number of this industrial group in the urban areas, the highest numbers of industrial units were mainly concentrated in Ludhiana district.

There was significant growth in number of units of textile-based industries in the urban areas of Amritsar, Jalandhar, Hoshiarpur, Ludhiana, Bathinda, Sangrur and Patiala districts. The share of textile units in the urban areas has been continuously increasing in these districts except the districts of Faridkot and Bathinda. It was mainly due to the reason that these districts were not suitable for textile-based industry because of soil texture and climatic conditions. However a remarkable shift in the rural area has been recorded since 1985 in Ludhiana, Amritsar, Kapurthala and Sangrur districts. At the State level, the concentration of textile-based industries was higher in the urban areas as compared to rural areas. The relative share of fixed capital in textile-based industries was highest in the urban areas of Ludhiana district. As Ludhiana and Amritsar districts are known as the industrial hub of Punjab, so more fixed capital has been invested in these districts in both rural as well as urban areas. The overall growth rate of textile-based
industries was quite satisfactory as compared to the food, beverages and tobacco-based industries in Punjab. The number of units and employment in the textile-based industry in Punjab has declined rapidly after carving out of new districts in Punjab (after 1991), but the amount of fixed capital has grown up by the same rate during the same period. The district-wise analysis shows that the total employment of textile-based industry has increased in the rural and urban areas during 1980-81 to 2005-06.

In 1980-81, the highest employment in textile-based industries was recorded in the rural areas of Jalandhar district whereas in urban areas, the highest employment providing district was Ludhiana followed by Jalandhar district and the remaining districts have negligible contribution in employment generation. The growth rate of employment in textile-based industries was higher in the rural areas as compared to the urban areas. Faridkot, Amritsar, Ludhiana, Kapurthala and Rupnagar districts have registered the highest compound growth rate in the rural areas. The growth of employment in the rural areas shows consistency as the employment in absolute number has increased in these districts. The performance of these districts in regard to textile-based industry in the rural areas was comparatively better.

The value of total output of textile-based industries was highest in the urban areas as compared to the rural areas. The contribution of Ludhiana district in total output was highest (94.33 per cent) whereas this value was lowest in Firozpur district (0.02 per cent) in the eighties. During 2005-06, in the rural areas, the highest value for output of textile-based industries was occupied by Amritsar district (43.58 per cent) followed by Ludhiana district (25.88 per cent) in Punjab whereas in the urban areas, Ludhiana district contributed highest share, i.e., 83.74 per cent of the total output in Punjab. This analysis reveals that textile-based industries were mainly established in Ludhiana district.

In 1980-81, the highest share in the number of units of wood, paper and leather and textile-based industries was of Sangrur district followed by Amritsar and Jalandhar districts. So, mostly the wood, paper and leather and textile-based industrial units were established in these districts during the eighties. But with the passage of time, the pattern of this industry has changed. And in the year 1995-96, the concentration of wood, paper and leather and textile-based industries was in Ludhiana district. In the year 2005-06, the share of Ludhiana district has declined to 16.61 per cent, whereas the share of Jalandhar district has increased. As far as, the growth rate is concerned, it was higher in Firozpur.
district as compared to Kapurthala and Ludhiana districts. In the year 1980-81, the percentage share of fixed capital of wood, paper and leather and textile-based industries was highest in Ludhiana district and lowest in Kapurthala district. In 2005-06, the share of fixed capital was highest in Jalandhar district followed by Ludhiana district.

The maximum number of units of wood, paper and leather and textile-based industries was established in the urban areas, but the growth rate of fixed capital was lower in the urban areas as compared to the rural areas. It means that due to increase in number of units of wood, paper and leather and textile-based industries in the rural areas the more amount of capital was invested with the passage of time. The employment has increased by 6.60 times in the rural areas whereas in the urban area, it has increased by 4.33 times during 1980-81 to 2005-06. The absolute number of workers has increased from 6058 in 1980-81 to 39998 in 2005-06 in the rural areas. The share of employment in wood, paper and leather-based industries in rural areas has increased but not consistently. In the urban areas, the employment was continuously decreasing over the period of time. The highest share of employment in these industries was generated in the urban areas of Jalandhar district. Therefore more concentration of wood, paper and leather-based industries was registered in this district.

The district-wise analysis shows that in the year 1980-81, the share of Jalandhar district in total output was highest in the urban and rural areas. During the year 2005-06, the proportionate share of Jalandhar district was highest in total production of wood, paper and leather-based industries followed by Amritsar, Ludhiana and Patiala districts whereas the percentage share of Nawan Shehar district was lowest.

The results reveal that Punjab State has relatively more growth in case of textile-based industries. The majority of number of units of food, beverages and tobacco; textile and wood-based industries were concentrated mainly in the rural areas due to availability of raw-material and special packages provided by the government. In case of food, beverages and tobacco-based industries, the highest number of units were established in Amritsar district and in Ludhiana district the same position was in the case of textile-based industries. As for as wood, paper and leather-based industries is concerned, Jalandhar and Amritsar districts emerged as industrial hubs.

The importance of any productive activity can be judged from its contribution to total output and employment. An increase in employment hardly carries any meaning if it
is not matched by increase in productivity. Labour and capital productivity increased more in the rural areas of Punjab. The per unit labour productivity was higher as compared to capital productivity. In Punjab, the indices of capital productivity in food, beverages and tobacco-based industries have increased during 1980-81 to 2005-06. In the rural areas of Punjab, the highest capital productivity was recorded by Rupnagar district and in the urban areas Patiala district registered the highest value of capital productivity in the eighties.

The food, beverages and tobacco-based industry has more labour productivity in the rural areas as compared to the urban areas except Ludhiana district. It comes out that Hoshiarpur district has per unit lowest value of capital and labour productivity in the food, beverages and tobacco-based industries. Labour productivity in all the districts can be increased by economies of scale and factor substitution.

It is observed that capital productivity in textile-based industries was higher in comparison to the food, beverages and tobacco-based industries in Punjab. The higher value of capital productivity in this industrial group was in the rural areas. In case of textile-based industries, the value of capital productivity was more in the urban areas of the districts which are created after 1991. In these districts labour productivity can be increased by technological changes, economies of scale and factor substitution. In the eighties, Hoshiarpur, Firozepur, Bathinda and Sangrur districts registered negligible rate of per unit capital and labour productivity in the rural areas. Punjab economy was dominated by the textile-based industries. The labour productivity in this industrial group was also higher than the other industries in Punjab.

The per unit capital productivity in wood, paper and leather-based industries shows declining trend in Nawan Shehar, Hoshiarpur, Faridkot, Sangrur and Patiala districts during the eighties. The value of this index was higher in Jalandhar district in the 1980’s but with the passage of time this had declined continuously. In the urban areas, Jalandhar and Kapurthala districts had the highest per unit capital productivity during 1980-81 to 2005-06. Jalandhar district achieved first rank in regard to labour productivity in wood, paper and leather-based industries. The change in labour and capital productivity could be due to several factors like technological changes, changes in inputs and economies of scale.
The output-employment elasticity in food, beverages and tobacco-based industries was greater than one in the urban areas of Jalandhar, Nawanshahr, Firozepur, Muktsar, Moga and Patiala districts. The output-employment elasticity of the food, beverages and tobacco-based industries was highest in Faridkot district. But in textile-based industries, the output-employment elasticity was highest in the urban areas of Faridkot and Sangrur districts. Amritsar, Kapurthala, Jalandhar, Hoshiarpur and Faridkot districts has elasticity more than one for wood, paper and leather-based industries in the urban areas. The output–employment elasticity in wood, paper and leather-based industries was highest in the rural areas as compared to the urban areas of Punjab. Jalandhar district had the highest output-employment elasticity in wood, paper and leather-based industries. It was mainly due to the reason that this district enjoyed the maximum concentration of wood, paper and leather-based industries. This analysis further reveals that output-employment elasticity was highest in food, beverages and tobacco-based industries followed by wood, paper and leather-based industries and lowest in textile-based industries.

The employment-output elasticity of food, beverages and tobacco-based industries was marginally higher in the urban areas as compared to the rural areas of Punjab. In the urban areas, employment-output elasticity in Mansa district was negative. The negative employment-output elasticity means decline in employment generation. The district-wise analysis reveals that during the period of 1980-81 to 2005-06, Fatehgarh Sahib district ranked first with 53.081 in terms of the value of elasticity, Kapurthala district occupied second rank (30.142) and Rupnagar district registered the third place (16.678 ) in textile-based industries. The employment-output elasticity in textile-based industries was higher in the rural areas as compared to the urban areas of Punjab.

This analysis reveals that the relationship between employment and production in food, beverages and tobacco-based industries was highly correlated and significant in the urban areas. But in the rural areas, this relationship was stronger in the textile-based industries. It has been observed that for the economy as a whole, food, beverages and tobacco-based industries registered more significant correlation with each other. The relationship between employment and fixed capital was significantly correlated for the textile-based industries in the urban areas. But in the rural areas, this relationship was statistically significant and correlated in the food, beverages and tobacco-based industries. The textile-based industrial group registered the highest correlation between
the production and fixed capital in the urban and rural areas of Punjab. It indicated that the relationship between production and fixed capital was positively and significantly correlated. With the increase in production, fixed capital will increase in the same manner as the former. The relationship between employment and production in wood, paper and leather-based industries recorded the highest value (0.802) at the State level as a whole than all the other variables. In this industrial group, significant correlation was registered in the rural areas. The correlation coefficient registered the lowest values in the urban areas as compared to the rural areas of Punjab. But all the values are positively and statistically significant at 1 per cent level of significance.

The regression analysis reveals that both the independent variables, i.e., fixed capital and level of output have the expected impact on per unit employment in the food, beverages and tobacco-based industries in the rural and urban areas of Punjab. In the urban areas of Punjab, the $R^2$ value was 0.812 which indicated that 81 per cent of the variations in employment can be explained by the independent variables. But in the rural areas of Punjab, approximately 94 per cent variations have been observed in employment in food, beverages and tobacco-based industries. The independent variable, i.e., per unit production has statistically significance at 1 per level in the rural areas.

Fewer variations have been observed in textile-based industries as compared to the food, beverages and tobacco-based industries in Punjab. In Punjab, the level of employment in textile-based industries was statistically significant at 1 per cent level. Fifty four per cent variations in employment can be explained by the independent variables in the urban areas of Punjab.

For Punjab as a whole, the value of $R^2$ was 0.713 for textile-based industries that indicated that 71 per cent of the variations in employment were due to the independent variables. For Punjab, the value of $F$ was 28.561, which determined the level of significance at 1 per cent level. The regression analysis indicates that both the independent variables have the expected impact on per unit employment in the wood, paper and leather-based industries in the rural areas of Punjab as compared to the urban areas. In the urban areas of Punjab, the $R^2$ value was 0.254 which indicated that only 25 per cent of the variations in employment can be explained by the independent variables, i.e., per unit production and fixed capital. It means that except these two variables, other
factors have 75 per cent influence for the determination of employment for wood, paper and leather-based industrial group in the urban areas of Punjab.

For Punjab as a whole, the value of $R^2$ was 0.653 for wood, paper and leather-based industries that indicated that approximately 65 per cent of the variations in employment were due to the independent variables. It is clear from the regression analysis that in the urban areas, the value of $R^2$ was highest (0.812) in food, beverages and tobacco-based industries as compared to textile-based industries (0.543) and lowest (0.254) among the wood, paper and leather-based industries whereas, in the rural areas, the value of $R^2$ was highest (0.941) in wood, paper and leather-based industries followed by food, beverages and tobacco-based industries (0.937) and lowest among the textile-based industries. At the State level as a whole, the value of $R^2$ was highest (0.899) in food, beverages and tobacco-based industries as compared to textile-based industries (0.713) and lowest (0.653) among the wood, paper and leather-based industries. So it is clear that independent variables have more influence on the dependent variable in the food, beverages and tobacco-based industries in Punjab.

**Policy Implications and Suggestions**

Agriculture sector plays a very important role in country’s economic development by providing food, raw-material, employment, income and surpluses for the industrial development. Though, agriculture sector is essential for the rural development as well as industrial growth but this sector faces some peculiar problems also. This sector has been neglected specially after the reforms period.

Agriculture sector is facing many problems in Punjab. Major problem is of diversification. Diversification cannot take place till some alternative to the existing wheat-paddy cropping pattern is developed which is as remunerative, if not more as wheat-paddy is and similar assured marketing facilities exist for these alternative crops. Diversification of agriculture is linked with the setting up of agro-based industries that involves some dealings with the rural people or where some knowledge about farm produce is useful for application in processing and other activities, and then there can be development of the rural economy. The fixation policy for minimum support prices of foodgrains is not satisfactory in Punjab. Agro-sector shows slow growth and poor extension services.
The farmers are in deep economic crisis in the State of Punjab. The share of agriculture has declined in terms of productivity and production in Punjab. Farm sector has recorded a decline in the recent years due to the cost price difference. Farm sector alone is not able to generate income and gainful employment opportunities. Stagnation in income is found in this sector. So, major problem regarding low productivity and production has generated the problems of raw material to the agro-based industries.

Generally, agro-based industries face both internal and external problems. Internal problems are those that occurred within the industry. External problems are those that are beyond the power of entrepreneurs. Major problems faced by these industries are problem of raw-material, inadequacy of management, marketing, power, technology, transportation, packaging and finance. In addition to all these problems, small-scale agro-based production does not have sufficient money for adjustment just as in the case of large or medium scale industrial units.

Power is an essential input for industrial development. This is also true for agro-industrial development. The problem of power cut is the biggest problem which is faced by the agro-based industries in Punjab. The rural agro-based industrial units of Punjab are facing this problem at the greater level. Due to this, there is no continuity in the production and power rates are very high in the State. The erratic supply of electricity is a major constraint.

The conclusions drawn from the study reveal that agro-based industries need special attention for further development in Punjab. Wheat, rice, sugarcane and cotton are the dominant crops in the State of Punjab. The area, production and productivity of these crops have increased over the time period. The marketed surplus / market arrivals of paddy and wheat are more in absolute as well as in relative terms. The four districts namely, Sangrur, Ludhiana, Patiala and Ferozepur contributed about 50 percent of total marketed surplus of paddy in Punjab. Thus, the government should take initiative to establish more paddy and wheat-based industries in these districts of Punjab. Therefore the Central as well as State governments should provide incentives for establishment of more agro-based industries according to the production and marketed surplus of these crops and this step will be beneficial for farmers because they will get remunerative prices for their produce as well as this will solve the problem of storage of these crops.
The results of the study indicate that the number of units of the food, beverages and tobacco-based industry, textile-based industry and wood, paper and leather-based industry have increased in the rural as well as in the urban areas of the State during 1980-81 to 2005-06, but majority of food, beverages and tobacco-based industries are concentrated in the rural areas whereas textile-based industries and wood, paper and leather-based industries are concentrated in the urban areas. Therefore, the government should give more incentives for the development of these industries mainly in the rural areas due to the availability of raw materials and cheap labour. This will create more gainful employment opportunities for landless labourers, marginal and small farmers in Punjab which may be helpful in checking the migration of people from the rural to urban areas in search of employment opportunities, reduce the pressure of population on land as well as minimise the regional disparities.

The district-wise analysis shows that the highest number of food, beverages and tobacco-based industries are established in Amritsar district and highest number of textile-based industry are established in Ludhiana district whereas wood, paper and leather-based industries are concentrated in Jalandhar and Amritsar districts. These three districts are known as industrial hubs. Therefore, government should develop these industries in the other districts of Punjab for avoiding over concentration of these industries as well as for achieving the objective of balanced growth.

Among the determinants of employment, it has been observed that fixed capital and output variables have significant impact. So any policy aiming at raising the productivity and profitability should focus on such issues so that these units can become competitive in the current era of global competition.

The financial support for rural agro-based industries should be made available under the Rural Industries Programmes. The financial help should be provided to the farmers and industrialists at low rate of interest. For the development of agricultural sector, there is need of new methods of cultivation and use of modern inputs. At the block level, there is generally a block information center that needs to be reorganised in order to provide programmes for development. So the necessary information about latest technology should be provided to the farmers and manufacturists. In order to understand more about the nature, process and purpose of policies, the required network of communication in industries would help the industrialists to solve many problems. The
development of IT sector and their output play an important role in the development of communication in agro-sector.

There is a need to modernise and develop the District Industrial Centers in all the districts to serve as the focal point of awareness and development of rural industry. The State government should set up modern training institutions for providing the technical and managerial guidance and taking measures to develop entrepreneurs. The State government should provide special incentives and concessions for the development of agro-based industries. The planning at the block and village level is also essential to map the available resources in the rural areas. This may be helpful for the entrepreneurs to establish the agro-based industries suitable to that area. The suggestion is that both the agricultural sector and agro-based industrial sector must be made more cost-efficient to exploit the hitherto untapped potential demand for their products, particularly from the rural masses for the backward and forward linkages.

The State as well as Central Government should take steps to explore the possibilities of collaboration of local firms with Indian as well as foreign agro-based firms for establishing new plants in Punjab keeping in mind the interest of farmers and small-scale domestic producers. The development of the economy of Punjab is not successful if the development of rural sector does not take place. There should be the development of networking. The networking is helpful to bring the industries together to overcome constraints and to reach market beyond their individual reach. With the change in economic scenario of Punjab, the policy for the development of agro-based industries is also changing. This may be helpful in solving the problems of agro-based industries in Punjab if the interests of farmers and domestic producers are taken care off.

Taking into consideration the problems of employment, finance and value addition, the government should help the producers (farmers) to form producers co-operatives. The producers and small manufactures co-operatives will be helpful to a large extent to solve the marketing problems and to build backward and forward linkages. The producers agro-based co-operatives will be helpful in providing employment to the farmers during their lean season. These co-operatives would have small finance requirements since those can be started at the houses/unutilised pieces of land owned by the farmers themselves. In addition to this the benefits of value addition would go to the farmers. There is need that the State government should provide suitable warehouse
facilities where the entrepreneurs could store their raw materials and draw them for processing as and when required.

The locally available agricultural raw materials, e.g., cotton, paddy or high value basmati rice, milk, fruits and vegetables and poultry provide a rich input base for agro-based industries such as cotton textiles, food processing including modern rice mills, and dairy industry, which are the major agro-based industries in Punjab. Besides enhancing the income opportunities for the farm sector, these linkages encourage agricultural diversification and lead to a more balanced use of land and water resources. Therefore, centre as well as state governments should provide various facilities like financial, technical, marketing, as well as storage facilities to farmers / producers for increasing production and productivity.

No doubt, Punjab has been a leading State in agricultural development and agro-based industries in India due to its enormous potential and availability of raw material. The State has the potential to emerge as a pioneering State in strengthening the agro-based industries due to the presence of huge agricultural surplus. The State has the entire necessary infrastructure (except power), required for the growth and development of agro-based industries. The State has much better road network, communicational frequency and technical knowledge which could immensely contribute to the growth of concerned sector. If a comparative analysis of Punjab’s economy in general and agro-based industries in particular is made, the State has comparatively a better position vis-à-vis other States of the country. The State has produced a comparatively much better result in the arena of agro-based industries in India.

But, it is also a fact that in order to compete at the national as well as international level, Punjab has to improve the quality of its agro-based industries products. The past two decades has been hailed by imbedded globalisation and market is highly poised towards more competitive environment in terms of quality of agro-based products in India in general and in Punjab in particular. So, there is a need of better infrastructure as well as technological advancement for the greater competitiveness of agro-based industries. The agro-based industries in the State need an innovative transformation and redirection in terms of ownership, organisation, technology and market procurement in order to match the present demand and supply scenario of the market.
To sum up, Punjab has achieved remarkable growth since independence and is now one of the richest State of India. Punjab is one of the few States in India in which rapid agricultural growth has induced rapid industrialisation. Punjab is agriculturally developed State and economic growth in Punjab has been closely associated with the well-known ‘Green Revolution’ and the future development lies in rapid industrialisation more so in the field of agro-based industries. Both sectors, i.e., agriculture and industry are playing an important role in the overall development of the State economy. Still the population of India and Punjab is increasing at a considerable rate and as a result there is a significant growth in the labour-force. The avenues of employment for this labour-force are one of the serious concerns. In this situation, the establishment and development of agro-industries is a keystone to the economic and social development of India as well as Punjab. Thus, the Central and State governments should give special incentives/packages for the establishment of agro-based industries in Punjab in general and especially in rural areas of Punjab. It may be safely concluded that the agro-based industries can play an important role to a large extent in solving the problem of poverty, unemployment and inequality in Punjab and can significantly contribute to the overall development of the economy by efficiently utilising the local raw materials which consequently may result in increase of gainful employment opportunities to poor people mainly landless, marginal and small farmers.