CHAPTER 11

REVIEW OF FINDINGS AND CONCLUSION

The district of Barddhaman has been crowded with many industrial units owing to the district's endowment of natural resources. From the detail analysis of different types of industries some relevant characteristic features may be enumerated below:

1. Sectoral Classification

About 35% of the district's total number of industrial units is under agro-based industry and 36% is in mineral-based industry like basic metal and engineering industry etc., while the rest is shared by Chemical, forest-based and miscellaneous industry. But the agro-based industry can absorb only 4% of district's total number of workers while 86% is absorbed by mineral-based industry. These two industries are most important and developed in two different parts of the district; mineral-based industry in western part, starting from Kanksa in the east to Barakar in the west; and the agro-based industry in the eastern part of the district. This eastern agro-based industrial area has 33% of the district's total number of industrial units and can absorb only 5% of the district's total number of workers. But the western mineral based industrial area has 67% of the district's total number of industrial units and absorb 95% of workers. Thus, the district is sharply divided into two economic sub-regions even in terms of industrial production.

(a) In the agro-based industrial sector of the east about 95% of the area's total number of industrial units is food-processing industry in which 94% is shared by rice mills. The employment capacities of these
units are very small, as about 58% of the area's total number of industrial workers is absorbed by all these food processing units. One medium size cotton mill is situated in Barddhaman police station which can absorb about 36% of this area's total number of workers at present. Oil mill is the only non-food processing industry in the district which is not significant in eastern agro-based industrial area.

(b) In mineral based industrial sector of the west, about 10% of the area's total number of industrial units is basic metal industry employing 61% of the area's total number of workers. About 25% of the area's total number of workers is employed by engineering industrial units, the percentage share of which is 33%. So, the number of engineering units is high and it can be stated that small as well as large-size engineering units are developed here. Small size units are found in metal parts and machine tools-producing group of engineering industry. Transport equipment producing industry is of prime importance from the view point of labour concentration.

2. Spatial Variation

The study is primarily concerned with the geographical distribution of industries among various spatial units. The police station of Durgapur is highly industrialized. It stands ahead of all other police stations in concentration of industrial units and manpower. This police station witnessed a steady growth of employment all through the period. The large size units like Durgapur Steel Plant, Alloy Steel Plant, MAMC, Acc Vickers Babcock, Hindusthan Fertilizer are located here. In 1960-65, DSP doubled its capacity and MAMC and Acc Vickers Babcock were established creating employment for 25% of the area's total number of workers. These helped the police station to overtake the industrial position of Hirapur and of Chittaranjan,
Asansol, Salanpur and Hirapur police stations in engineering industry showing 178% growth of employment. During 1965-70, about 51% growth of employment was noticed in this police station in all industries for which the percentage share of industrial employment in Durgapur police station was increased from 25% in 1965 to 34% in 1970. At that time Alloy Steel Plant, established in 1965, increased its capacity (2253% growth) and capacity of DSP was increased by 42%. Thus three-fold increase of manpower in DSP and a sharp rise in the employment capacity of the Alloy Steel Plant accentuated for the industrial growth of the district within a span of ten years from 1960-70. About half of the area's total small-sized units came up then. Owing to substantial growth of manpower in Chemical industry (1330%) like Hindusthan Fertilizer (established in 1968) and certain growth of manpower in DSP during 1970-75, a significant role in Durgapur police station could be noticed. Now 38% of the district's total number of industrial workers is employed by the large size units of Durgapur. From the point of small industries concentration, Durgapur also ranked first right from 1960.

Hirapur ranked first in 1960. Then the position was overtaken by Durgapur police station. The establishment of IISCO Workshop (an existing unit) had an important role to hold the second position. About 80% of the area's total number of workers is employed by this unit. An engineering unit that is under IISCO, can absorb about 15% of the area's total number of workers all through the period. Due to the reduction of employment capacity of IISCO workshop the police station had to lose its position and it was marked either by decay or stagnation throughout the whole period.
Chittaranjan ranked third from 1975 onward. The area witnessed certain growth of manpower all through the period. Engineering industry like Chittaranjan Locomotive Works is an existing unit and the area's only large size industrial unit.

Raniganj and Asansol had been developed prior to the study period and these police stations held a major role in the percentage share of industrial units in 1960. Raniganj ranked third up to 1970 and then the position was degraded due to the closure of J.K. Nagar Aluminium factory in 1975 and the position was overtaken by Chittaranjan police station. The establishment of Bengal Paper Mill and some medium size ceramic works are found here. Asansol is now important only for one large size unit (Sen Raleigh Ltd.) which was established during the First Plan. Asansol had a significant role in the earlier part of study period. But the large size cotton mill was closed in 1965 for which the police station had to lose its position.

Kulti had industrial importance due to the establishment of IISCO Workshop. But it decreased its capacity in 1965-70 for which the police station had to lose its position and now it is marked by stagnation.

On the other hand, the development of traditional agro-based industry, in which the district ranks second only to Biritbhum district, helped the police stations of the east to be statistically significant. The police station of Barddhaman located in the midst of agricultural land has been holding the leading role since 1960. Most of the units are existing rice mills. About 41% of the district's total number of rice mills is concentrated here giving employment to 40% of their workers. The growth rate was maximum in 1960-65. Though many industrial units were closed all through the period, the establishment of new units and opening of some closed units helped the area to stand ahead of all others. Most of the units are now reducing their capacities.
Kalna ranks second from 1975. Before that, Aush gram ranked second. From 1970, the condition of Aushgram had stagnated and the position was overtaken by kalna due to the establishment of many new units. There was no growth of rice mills in Katwa police station. These three police stations have seen a gradual decline due to the closure of rice mills.

The number of rice mills in Galsi, Khandaghosh, Raina and Jamalpur police stations increased throughout the study period, but the rate of improvement was not statistically significant.

The remaining police stations in the northern part of the district, like Ketugram, Monteswar, Purbasthali, Bhatar and Mongolkot have no industrial significance.

Temporal Variation

The industrial analysis of the district over twenty two years of study brings out temporal variations in the trend of industrial growth. The overall growth rate of industrial units in the district is 110% for the study period while it is 74% in West Bengal. The growth rate of manpower has been 84% while the State's total was 2%. The picture will be clearer after a sub-periodical study.

Period-I (1960-65) - It is characterised by the growth of basic and heavy industries. A remarkable growth of manpower was noticed in DSP which doubled its capacity during this period for which 57% growth of manpower and 22% growth of industrial units are to be found in basic metal industry. Many new engineering units appeared in the picture showing 90% growth of manpower in this group of which 65% growth was recorded by the industrial units of Durgapur. About 48% of the area's total number
of industrial units was new. In Raniganj police station 33% growth of manpower was noticed in the Bengal Paper Mill. Thus, the district experienced maximum growth during the earlier part of study period.

Period II (1965-70) Certain growth of manpower (16%) and industrial unit was also noticed in the district during this period. Basic metal industry was responsible for such growth indicating 60% of the district's total rise in manpower. At that time 50% growth of manpower was also noticed in DSP. But engineering industry, helped the police stations of the east to be statistically significant.

The police station of Barddhaman, located in the midst of agricultural land has been holding the leading role since 1960. Most of the units are existing rice mills. About 41% of the district's total number of rice mills is concentrated here giving employment to 40% of their workers. The growth rate was maximum in 1960-65. Though many industrial units were closed during this period, the establishment of new units and opening of some closed units helped the area to stand ahead of all others. Most of the units are now reducing their capacities.

Kalnr. ranks second from 1975. Before that Aushgram ranked second. From 1970, the condition of Aushgram deteriorated and the position was overtaken by Kalna. There was no growth of rice mills in Katwa police station. Three police stations have seen a gradual decline due to the closure of rice mills.

The number of rice mills in Galsi, Khandaghosh, Raina and Jamalpur police stations went on rising through out the study period, but the rate of growth was not statistically significant.
The remaining police stations in the northern part of the district, like Ketugram, Monteswar, Purbasthali, Bhatar and Mongolkot have no industrial significance.

The growth of chemical industry started at that time. Thus the district experienced industrial growth during these two periods. The growth of agro-based industry was also noticed during this period. A peculiar characteristic feature of the agro-based industry is that major set back in the growth of rice mills is always compensated by the establishment of some new units and the opening of some closed units.

Period III (1970-75) - The period was marked by downward curve in the growth of industry. This is the period when all the industries experienced recession. Industrial recession in Raniganj was noticeable during this period when J.K.Nagar aluminium factory was closed. Some large size old units reduced their capacities at that time. In Durgapur about 58% of the area's total number of engineering units was closed. Chemical industry was the only industry which showed some growth. Growth rate of manpower in Hindusthan Fertilizer in Durgapur police station helped the area to exhibit positive curve of growth in period-III.

Period IV (1975-80) - The period saw some revival from such recession when about 21% of the district's total number of industrial units was newly established creating employment to 24% of the district's total number of industrial workers. Some of the old large sized units increased their capacities and some closed units were re-opened like J.K.Nagar aluminium factory, though its capacity was decreased. The district experienced the growth of industrial units but there has been a continued stagnation in terms of manpower absorption. It is clear that now the trend is an increase in the
number of small units as against a marked increase in the number of large units in period I.

Period-V (1980-82) - Certain growth of industrial units was noticed in the district's total picture during this period. But there was no growth of manpower except in the basic metal industry, as DSP and IISCO increased their capacities. The growth of manpower has been 17%. Chemical industry, which underwent a steady growth in periods II and III, experienced stagnation in period IV and V.

Only small size industries have grown during the period.

Size-Class Variation

The industrial picture of the district is characterised by some large-sized units which absorb about 77% of the district's total number of industrial workers. There is no other district in which so many large-sized units are concentrated. These large units are found in Durgapur, Salanpur, Hirapur, Kulti, Asansol, Chittaranjan and Raniganj police stations. Most of these large units are in basic metal and in engineering industry. Medium-sized units are noticed in chemical industry and in non-metallic mineral products. In non-metallic mineral products some medium-sized units absorb 68% of the district's total number of industrial workers of this group.

But the sizes of agro-based industry are very small except the one cotton mill near Asansol. These small units of agro-based industry account for 3% of the district's total number of industrial workers. It can thus be stated that about 80% of the district's total number of industrial units is small employing about 13% of district's total number of registered industrial workers. The large units have had a spread effect of industrialization in
Asansol and Durgapur industrial complex developing sub-contracting relationship between the heavy, basic industry and the small engineering units. On the other hand, the agro-based and timber producing units are traditionally small and old.

Another noticeable aspect in the study of the industrial profile of the district is that 85% of the district's total number of industrial workers is absorbed by the public sector plants. Most of these are heavy and basic metal factory units. Though the number of public sector plants is few, these have a significant role in terms of labour concentration. There is no public sector plant in agro-based industry. Some arms and ammunition depots under public sector are found at Panagarh in Kanksa police stations. Some public sector plants like Durgapur Thermal Power Station and Durgapur Projects Ltd. (DPL) are found in Durgapur police station.

About a quarter of the public sector plants are undertaken by IRCI during 1975-80. All the registered industrial units of Chittaranjan police station are under the public sector. About 70% of total number of industrial workers of Durgapur police station is engaged in the public sector plants. Most of the medium and small units are usually established by private sector and sometimes these are undertaken by IRCI.

Sketch 9 shows a relation between industrial units and their manpower from 1960 to 1982. Here it can be noticed that the relation differs from 1970. The maps beside the graph show the standard value of police stations. Here standard value of Asansol and Raniganj are declining from 1965-70. The number of police stations having standard value are declining gradually.

* See table in the appendix.
Sketch 9

REGRESSION ANALYSIS

1970

\[ Y = -0.23 + 0.76x \]
\[ r = 0.71 \]

1965

\[ Y = 1.76 + 0.63x \]
\[ r = 0.71 \]

1960

\[ Y = 3.37 + 0.63x \]
\[ r = 0.79 \]

Conf. 99.2
Sketch 11
INDUSTRIAL ZONES OF BARDDHAMAN DISTRICT

INDEX

Zone I
Zone II
Zone III
Zone IV
Zone V
Zone VI
Zone VII
Zone VIII
Zone IX
Zone X

Scale
10 km

sketch 11 INDUSTRIAL ZONES OF BARDDHAMAN DISTRICT
X 3U0Z
Sketch 10 shows the distinctiveness of industries. Here Durgapur is highly industrialized as basic metal industry, engineering industry, chemical industry and non-metallic mineral processing industries have got distinctiveness. Raniganj is distinctive only for non-metallic mineral processing industry, Chittaranjan for engineering, Hirapur for basic metal and Barddhaman for agro-based industry. Depending on these two statistical diagrams the industrial zones are delinated in the concluding part following some indicators those are discussed in the previous chapters.

Conclusion

Barddhaman is the most industrialized district in West Bengal. There are different characteristic features of industrial development. The district may be divided into several industrial zones depending on the character of industries they contain. The relevant characteristic features like sectoral, spatial and temporal variations of industries are the major criteria to divide the district into industrial zones. These industrial zones have been drawn on the basis of the police station boundaries.

An industrial zone may be identified as an area having some industrial characteristics which is more or less homogeneous within its boundary. Here the indicators are types of industries, their concentration, growth rate and size class. In order to make a geographical evaluation of the district from the standpoint of industrial growth, the following industrial zones are delinated (Map No.11)

* Scale of distinctiveness in the appendix.
Zone-1 is a basic metal industrial zone in Durgapur police station. The area is highly industrialized and developed from early sixties when the Second Plan policy was implemented. It is the zone where different types of mineral based industries are located. It accounts for about 15% of the district's total number of industrial units with nearly 45% of the district's total number of workers. This area was characterised by the growth of some large-sized public sector plants in engineering and basic metal industry particularly during 1960-70. Three-fold increase of manpower in Durgapur Steel Plant within a span of 10 years (1960-70) helped the area to be the most significant industrial zone. The basic metal industry of this zone absorbs above 30% of the district's total number of industrial workers and half of the district's total number of industrial workers belonging to this industrial group. The area experienced marked growth up to 1970 and then in the following period only chemical industry was developed. Non-metallic mineral producing industry has also got a distinctive role. Large sized units attracted a large number of small ancillary units from 1965. The increasing trend in the number of small units is also noticeable at present.

Zone-II is an old basic metal industrial zone of Kulti and Hirapur police station. The area characterised by the existence of some old basic metal industrial units of IISCO located in the western corner of the district. Two large sized units of IISCO could absorb about 43% of the district's total number of industrial workers and 75% of the districts' total number of industrial workers of this group of industry in 1960. After that, the position was overtaken by Durgapur police station. The area held a leading position in the district up to 1965 which was followed by industrial recession and the area is marked for such recession. Apart from basic metal industry,
one large-sized engineering factory and another medium sized non-metallic mineral processing unit are established here. There was marked stagnation all through the period. At present, small units have come up in this area. About 20% of the district's total number of small units are developed here.

Zone-III - The area is an enclave of engineering units in Chittaranjan and Salanpur police stations developed around the Chittaranjan Locomotive and the Hindusthan Cable Factories. These two were existing units under public sector. These units absorb about 10% of the district's total number of workers and 40% of the district's total workers engaged in engineering industry. One medium sized basic metal industrial unit was also established here in 1970. The situation appears to show a positive curve of industrial growth throughout the period. An interesting point to note here is that though the area is an enclave of large-sized public sector plants, but the number of small units is few.

Zone-IV - It is the area where non-coking coal mines are located. Asansol and Raniganj police stations are included within this zone and the area is the chief centre of coal resources in the State. Apart from this, one large-sized engineering unit and some medium-sized chemical and non-metallic mineral processing units were responsible for the area's industrial significance. The closure of large-sized aluminium factory in Raniganj police station in basic metal industrial group was responsible for the area's industrial recession during 1970-75. There has been some revival in recent times due to the intervention of the IRCI. Both these police stations had an important
role in the beginning of the study period and now the condition is stagnating. But Asansol ranks second in considering the small units from 1960 onwards.

**Zone-V** - Collieries like Pandaveswar, Salanpur and Sripur under the Eastern Coal Ltd. are located here and may be called as a 'Coal-mining area'. Here the soil is very poorly cultivated. The police stations like Barbani, Jamuria, Faridpur and Ondal are included here. The area is characterised by some small industrial units and one medium sized non-metallic mineral processing unit. Here Barbani and Jamuria stands for small units of agro-based industry while Faridpur and Ondal police stations have small units in engineering industry.

**Zone-VI** - It is 'traditionally agro-based industrialized area' in the central part of the district where Barddhaman police station is located. It accounts for above 43% of the district's total number of rice mills and remains in the same position till now. Most of the rice mills are existing units and there is growth of rice mills all through the period. One medium-sized cotton mill has also favoured the situation. Some small sized engineering units are also found here.

**Zone-VII** - This is the agricultural area in the south and south-east. The area included Raina, Jamalpur, Khandagosh, Memari and Galsi police stations, where the number of rice mills have gone up though not to a great extent. This trend was somewhat checked in 1960-65 and again in 1970-75. This area now accounts for 25% of the district's total number of rice mills.
Zone-VIII - It is in the eastern part of the district including Kalna, Katwa police stations and Aushgram police station in the centre. Here 25% of the district's total number of rice mills is concentrated. The zone has seen a gradual decline due to closure of rice mills in 1970 and again in 1980. There is slight revival due to the establishment of some new units. Though the area ranks second, next to Barddhaman in concentration of rice mills, but it shows a declining curve in the growth rate of rice mills all through the period.

Zone-IX - The area is purely an agricultural land in the northern part of the district where the number of industrial units in the formal sector is very meagre. The police stations are Bhatar, Mangolkot, Ketugram, Monteswar Purbasthali and Bud Bud.

Zone-X is the transitional zone of eastern agricultural and western mineral-based industrial area where some arms and ammunition depots are found. It is in Kanksa police station.

Thus the study has clearly revealed the nature of industrial growth in the most industrialised district of West Bengal outside the CMD. It has brought out the temporal as well as the spatial characteristics of the process of industrialization in the district which is not only endowed with a few significant mineral resources but is also home of 'green revolution' in the State.

An insight into the detailed characteristics of the processes of industrialization acting in a district like Barddhaman adds to our understanding of the present state of economy of West Bengal. The zones indicate the spatial characteristics of the process of industrialisation.