CHAPTER II
STUDY AREA

2.1 INTRODUCTION

The premier coalfield of India, the Raniganj coalbelt is known as the birth place of the Indian coal mining industry (Mehta et al, 1977). It is also the second largest supplier of good quality coal in the country at present next to Jharia coalfield. In this chapter we will discuss about the studied area, its geographical location, and physical characteristics etc.

Geological Survey of India (GSI) describes this region as the 'Raniganj coalfield' (RCF) and define it as the easternmost field in the Damodar valley situated about 200 kilometres northwest of Calcutta. The Coal India Limited (CIL) too follows this definition. A greater portion of this area is in the Burdwan district, West Bengal, while a small portion on the west, separated by the river Barakar, lies in the Dhanbad district, Bihar, and another across the Damodar on the south in Bankura district. In the present research it has been renamed as the ‘Raniganj coalbelt’ (RCB) to mean that part of RCF, which lies within Burdwan district of West Bengal. The Raniganj coalbelt is bounded on the northwest and south by the Archeans but in the east laterite and alluvium soil which lie over the material of Gondwana strata. The main portion of the region is bounded by the Ajoy river in the north, the Damodar on the south and the Barakar on the west. In view of the concentration of most of the mining activities within the interfluves of the Damador and Ajoy rivers, the Raniganj coalfield mainly is confined to the area lying with in geographical limit of 23°33' to 23°53' north latitudes and 86°37' to 87°23' east longitudes.

2.2 LOCATION AND AREA

The Raniganj coalbelt comprises a total area of nearly 1,260 square kilometers, and is located about 250 kilometers northwest of the Calcutta metropolis, the capital of West Bengal, and the area is bounded by 23°28' and 23°53' north latitudes, and 86°48' and 87°26' east longitudes (figure-2.1). A major part of the Raniganj coalfield falls within the Burdwan district (West Bengal). The Eastern Coalfield Limited (ECL) has divided this part into thirteen areas, namely, Pandaveswar, Bankola, Kunustoria, Kenda, Kajora, Satgram, Sripur, Sodepur, Sitarampur, Salanpur, Sonepur, Kottadih and Jhajhra. This coalbelt contains 109 mines, of which 92 underground (UG) and 17 opencast mines (A list of mines area-wise is enclosed in chapter V). The coal seams extend underground into
Location
The Raniganj Coalbelt

23 50 N
Chittaranjan

23 40 N
Salanpur
Banakar
Kulti
Asansol

23 30 N
Raniganj

India
86:50 E
88:50 E

Burdwan District
West Bengal

26 N
88:50 E
26 N

87 E
40 km
88 E

0 10 20 km
0 200 km
0 1000 km

FIGURE - 2.1
Bihar where they have given rise to the Jharia coalfields. Our study area contains 11 administrative units (police stations figure-2.2) namely, Chittaranjan, Salanpur, Baraboni, Asansol (North), Asansol (South), Raniganj, Jamuria, Kulti, Hirapur, Ondal and Pandaveswar (figure-2.3 and 2.4) The region is highly urbanized and densely populated; it is the second most economically prosperous region of West Bengal besides the Calcutta industrial belt (Lahiri-Dutt, 1986).

The Raniganj coalbelt has been selected for the present research especially for its unique nature of coal in India. A large industrial belt has been developed from Durgapur to Asansol urbanization on the basis of this good quality of coal. It reminds one of the Ruhr in Germany and has been called as the Ruhr of West Bengal. After Calcutta, the western part of Burdwan ranks second in urbanization and forms an industrial corridor in West Bengal. The RCB occupies the second position in extracting good coal in India after the Jharia coalfield in Bihar. Jharia area is more prone to surface fires than the Raniganj coalbelt and is the main reason why it attracts many researchers. Yet, in Raniganj area the overall impacts on the environmental of mining has a large history. Above all, there were several subjective factors leading to the selection of RCB as a study area. These include the proximity of RCB to residence and our familiarity to it.

2.3 PROBLEM OF AREA DEMARCATION

For the purpose of present research the Raniganj coalbelt has been demarcated by the following considerations:

1. Administrative boundaries of Burdwan district of West Bengal,
2. According to the area of different mining company authorities, controlled by Indian government (some mines in Raniganj coalfield are being controlled by BCCL),
3. Natural boundaries such as river (Ajoy is the western natural boundary between Raniganj coalfield and BCCL),
4. Geological epoch to formation of coal – RCB coal mostly are in Raniganj series in Gondwana period (RCB includes the Barakar series also),
5. Nature of coalfires (mostly surface fire),
6. Quality of coal, that is, moisture content, coking category etc. Raniganj coalbelt differs from Jharia coal in this aspect (a gradual coal deposition in the RCB).
7. Finally on the basis of urbanization and industrialization – RCB are developed as densely populous area after Calcutta metropolitan in West Bengal.
POLICE STATION WISE STUDY AREA
THE RANIGANJ COALBELT

FIGURE - 2.2
At present, India is the third largest coal producer of the world. Of the total Indian production, the Raniganj region currently comes fourth among the various subsidiaries of CIL. The total coal reserves of Raniganj are estimated at 1,900 crore tones of non-coking coal and 80 crore tones of coking coal (Sarkar and Sarkar, 1995). The region contributes about 20-25 per cent of total Indian coal output and second largest in the country. There are 109 collieries operating in the region of which 92 are underground and 17 are open cast, producing about 158 lakh tons of coal annually and directly employing about 1,73,681 people. The total population of the region is 21,91,007 and the region has a high level of urbanization (67 per cent as compared to the national level of about 25 percent) as a result of mining expansion in recent decades. There are 37 mining towns in the region as identified from their occupational data provided by the Census of India (Lahiri-Dutt, 1996).

Raniganj along with the Jharia region was the single largest supplier of coal for about hundred years since mining began in the last quarter of eighteenth century in India. The existence of coal has been known in India, and some authors have noted the existence of archaeological evidences of the use of coal since ancient times (Murthy and Panda, 1988).

In 1774 Warren Hastings granted exclusive rights to work and sell coal in Bengal for a period of eighteen years to two East Indian Company employees, who worked in six mines, three of which were at Chinakuri, Aituria and Damodar (Paterson, 1910). In spite of local enthusiasm, initially the company showed little interest in developing the coal resources in India. Then the Governor of Bengal, Lord Canning, had little interest in developing the internal resources of India. Since English coal was being imported and being sold to other countries of the world as well.

The first Indian coal company under European supervision was the Raniganj mine open in 1820 by Alexander and company, which was made possible by the efforts of a mining engineer – Mr. William Jones – aptly called the Father of coal mining in India.

After 1820, other coal mines under European management were in the Raniganj coalbelt – they are Chinakuri (1823), Damulia (1824) and Chanch and Nuchibad (1830). Prince Dwarkanath Tagore was the first Indian to invest in coal (Ghosh, 1994).

After the introduction of steamers the demand for coal rapidly increased. The Report of Coal Committee in 1845 drew attention to the difficulties in transport and the expenses involved in transporting the coal to Calcutta. The committee recommended that the
coalfield be made accessible by railways. The Superintendent of the Geological Survey of India, Thomas Oldham, in his report dated 14 June, 1859, furnished to the government a statement of the yearly output of coal at that time from various collieries in the Raniganj coalbelt. It is interesting that, there were 17 companies and concerns operating in this belt.

Another interesting point to note is the dominance of indigenous entrepreneurs in the mining industry. There were 13 of the total 17 concerns owned by Indian operators. The low levels of technology and capital investment ensured that Indian landowners could make an easy entry into this industry (Rothermund and Wadhwa, 1978).

The growth of coal mining industry was the development of Indian railways. Lord Dalhousie was quick to realize significance of railway construction in India (Munsi, 1980), and after the initial doubts, Calcutta was soon connected with its hinterland — Raniganj coalfield being the first of them in 1855.

Throughout the nineteenth century, the Raniganj field remained the only important source of coal in India. Out of a total production of 6.12 million tones, its share was 2.55 million tones.

The difficulties of importing of iron and steel materials during the World War I years, gave an impetus to the indigenous industries. As a result, a number of steel mills as well as engineering companies were established to meet the requirements. This increased the demand for coal, which led to an increase in coal production and a sudden prosperity in the coal industry. The use of coal as domestic fuel also became popular at this time.

The period of 1942-45 saw a coal famine due to a sudden fall in production caused by the equipment, wartime labour scarcity, and lack of proper transportation facilities. To meet this situation of colliery control order of 1944 was passed for assuming control over prices, production and distribution of coal. The Coalfield Recruiting Organization (CRO) was introduced to maintain, often forcibly, the supply of labour to the mines (Maindara, 1946).

After independence, the changes in government policies favouring industrial development. Opened new vistas for coal exploitation in the region, (Kumarmangalam, 1973) structural change was initiated whose full impact was felt by the region during the 1970s and 1980s.
The total coal reserve of Raniganj are estimated at 1,900 crore tones of non-cooking coal and 80 crore tones of cooking coal (Sarkar and Sarkar, 1995). The region now contributes about 20-25 per cent of total Indian coal output, and is considered to be the second largest in the country. At present, the 109 collieries in the region employ about 1,73,681 people.

2.5 PHYSIOGRAPHIC CHARACTERISTICS OF THE REGION
The physiographic characteristics of the RCB are immensely different from eastern part of Burdwan district. East west dichotomy has been revealed due to extensive mining activities in the western portion surroundings of the RCB. After Ondal the topography is basically rugged, undulating and dried landform. The main physical divisions are: (1) eastern low alluvial plains, (2) central rolling plains, (3) central uplands, (4) western plateau and plateau fringe.

2.6 MINING ENVIRONMENT
Before coal was discovered in this belt, the area was habitated by trees mainly sal (Soreo robusta), mostly inhabited by tribals (Paterson, 1910). Local environment mainly vegetation are ruined up gradually due to coal extraction, overburden dumps, and huge subsidence. Noxious smokes, widespread cracks, relatively high temperature due to coalfires have a deep impact on natural vegetation. Recently some aforestation measurements are taking to restore natural environment.

2.7 TOPOGRAPHY
The area is characterized by a very gently undulating profile with the average height of the ground level varying between 70-160 metres. The relative relief of the area ranges from two metres to more than 80 metres, which indicates that in Raniganj coalbelt, relative relief is low. Over most of the area it is between 5 to 10 metres. Due to river valley and soil erosion, the area is gently sloping down towards east and southeast.

The Raniganj coalbelt comprises generally a gently undulating country with the general altitude between 65 to 75 metres above the mean sea level. The topography is predominantly monotonous.
2.8 DRAINAGE SYSTEM

Major portion (71 per cent) of the RCB comes in the interfluve of two rivers viz. The Ajoy and the Damodar which flow from west to east at its northern and southern boundary respectively. Though northwestern margin is approximately marked by the north south flowing Barakar but the coal field limit extends beyond this along the Khudia river up to Nirsa town. East of present margin all small drainage channels in the Raniganj Coalbelt is known as Jhor, Nunia is like that one (figure-2.5).

2.9 CLIMATIC PHENOMENON

Climatically the area is subhumid and tropical which has three seasons that is, summer, rainy and winter in succession. The annual rainfall is 1206 milimetres and mean annual temperature is around 25.4°C. The maximum temperature often goes over 40°C in summer (May-June) and minimum temperature below down 10°C. The rainfall takes places during monsoon and may exceed 300 milimetres in the wettest month (June-September). The climatic parameter are given in table-2.1. During May and June the area is subjected to cyclonic, storms, locally called Kalbaisakhi. The temperature remains constant from June till October.

<table>
<thead>
<tr>
<th>Month</th>
<th>Maximum monthly rainfall in milimetres</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Max. (Avg.) °C</td>
</tr>
<tr>
<td>January</td>
<td>3</td>
<td>26</td>
</tr>
<tr>
<td>February</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>March</td>
<td>44</td>
<td>33</td>
</tr>
<tr>
<td>April</td>
<td>20</td>
<td>38</td>
</tr>
<tr>
<td>May</td>
<td>46</td>
<td>40</td>
</tr>
<tr>
<td>June</td>
<td>293</td>
<td>34</td>
</tr>
<tr>
<td>July</td>
<td>226</td>
<td>33</td>
</tr>
<tr>
<td>August</td>
<td>319</td>
<td>32</td>
</tr>
<tr>
<td>September</td>
<td>170</td>
<td>32</td>
</tr>
<tr>
<td>October</td>
<td>69</td>
<td>32</td>
</tr>
<tr>
<td>November</td>
<td>1</td>
<td>28</td>
</tr>
<tr>
<td>December</td>
<td>5</td>
<td>26</td>
</tr>
</tbody>
</table>

FIGURE - 2.5

Drainage Pattern
The Raniganj Coalbelt

River/water bodies
Water Channels

0 5 10 km.
The climate of the area is humid and tropical. It is characterized by a hot and dry summer from March to May, a monsoon or rainy season from June and September and cool pleasant winter from October to February. Maximum and minimum temperature recorded in May and January in this region are 48°C and 10°C respectively. The highest rainfall occurs in the month of July (350 milimetres) and lowest in the month of December (3 milimetres). Relative humidity is high in the month on July and August and low in the month of March.

2.10 FLORA AND FAUNA

The area around Raniganj was a part of forest land in the seventeen century. The conversion of large tracts of forest into agriculture in order to increase the district revenue and subsequent mining activities have forced the forest resource to decline substantially. The forest land in the study area have also degraded radically.

*Sal* is the dominant species in this area. Plants like *Adina cordifolia* has been traditionally linked with festivities of local people for centuries. Such patches of forest have become rare.

The vegetation in the core area mostly conforms to the mixed deciduous type. Some plants like *Acacia auriculiformis*, *Cassia siamea*, *Eucalyptus*, *Leucaena leucocephalia*, *Peltophorum pterocarpum* etc. have been planted due to aforestation but in limited areas. In many villages trees such as *Mangifera indica*, *Syzyium cumini*, *Psidium guajavana*, *Artocarpus integrifolia*, *Carica papaya*, *Musa paradisiaca*, *Ficus begalensis*, *Tectona grandis* are found.

The District Gazetteer of 1910 mentions that there had been large scale deforestation of dense *sal* forest over large areas and the process was continuing ruthlessly. In some blocks like Salanpur, Ondal, Raniganj, Asansol, deforestation had been done speedily. An ECL report (1988), however concluded that till the early part of this century coal mining had hardly encroached upon the forest land of the region.

The report from 1951 Gazetteer mentions that in the deltaic portion of the Burdwan District, all available ground had been taken up for village. In this connection, three observations can be made:

1. necessary safeguards are required to ensure least disturbance/damage to forests;
2. aforestation must be carried out in conjunction with mining; and
3. the Forest Conservation Act, 1980, which was enacted to ensure necessary safeguards to see that the forest area is not unnecessarily used for non-forest uses must be enforced properly.
As per the 1910 District Gazetteer tigers, which had been common in the district in the past, had entirely disappeared by that year. There were some wolf, hynaeas, wild pigs and monkey; poisonous snakes. Amongst game, birds and sheep were abundant in the rice fields. Grey and black partridges, game foul and jungle foul were plentiful.

The current faunal pattern, as true for flora, perhaps represents only a small percentage of original fauna of Raniganj region. The regression of fauna becomes more obvious if one compares the same fauna of adjoining non-coal mining areas, specially those conserved in the protected reserves.

2.11 SOIL COMPOSITION
Soil condition is very poor in mining region due to climate geology and other natural phenomena. The RCB belongs in sub tropical climate. Due to huge leaching soil mainly lateritic and some portion under alluvial soil. The terrain is in under rockies.

2.12 ECONOMIC ACTIVITIES AND TRANSPORT
The people in the RCB are predominantly engaged in mining activities. Other economic activities are limited to agriculture, industries etc. The area is traversed with the main branch of eastern railway with Asansol as an important junction from which one can reach Purulia. Ondal is another important junction connecting Ukhra (Pandaveswar) and Siuri. Grant Trunk road (NH-2) also crosses from one end to other end connecting region with Calcutta in south east and Delhi in northwest. Other important arterial roads in the area connect places like Katwa, Kalna, Nabawimp, Bolpur etc. (figure-2.6)

The eastern railway and the Asansol-Adra section of the south eastern railway connect different parts of the area. The Calcutta-Delhi Grand Trunk Road running almost parallel to the main line of the eastern railway passes through Asansol and Raniganj, the two most important towns of the coalbelt. The entire area along the G.T. Road and the railways has become urbanized in recent years and has taken the shape of a sprawl (Lahiri-Dutt, et al., 1998).

2.13 GEOLOGY
The southern boundary of the basin is faulted with a series of ‘en echeloni’ faults generally known as ‘Main Boundary Faults’, while the northern contact is unconformable. Over the greater part of the northern side, the Gondwana boundary is one
FIGURE - 2.6

Transport Network
The Raniganj Coalbelt

Railway tracks
Roads

Chittaranjan
Salanpur
Kulti
Burnpur
Asansol
Raniganj
Ondal

0 5 10 km.

86°10'E 87°10'E 87°20'E
30°N
of the original deposition, modified of course by later erosion. The oldest beds are found in the north, and are overlapped by younger bases in a southward direction, the general dip being also southward. Besides the boundary faults there are also oblique and cross faults in the field. The main dislocation probably took place in the Jurassic. The field is traversed by many dolerite and mica-peridotite dykes, the latter having produced much damage to coal. The intrusive are later than the faults and may be of Rajmahal or Deccan Trap age. The Gondwana succession in the Raniganj coalbelt included six formations gradually (table-2.2).

<table>
<thead>
<tr>
<th>Formation</th>
<th>Description</th>
<th>Maximum thickness (in metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supra-Panchet</td>
<td>Red and gray sandstones and shales</td>
<td>300</td>
</tr>
<tr>
<td>Panchet</td>
<td>Micaceous yellow and gray sandstones, red and greenish shales</td>
<td>600</td>
</tr>
<tr>
<td>Raniganj</td>
<td>Grey and greenish soft felspathic sandstones, shales and coal seams</td>
<td>1050</td>
</tr>
<tr>
<td>Ironstone shales</td>
<td>Dark carbonaceous shales with ironstone bands</td>
<td>360</td>
</tr>
<tr>
<td>Barakar</td>
<td>Coarse and medium gray and white sandstones, shales and coal seams</td>
<td>630</td>
</tr>
<tr>
<td>Talcher with boulder-</td>
<td>Coarse sandstones above and greenish shales and sandy shales below</td>
<td>300</td>
</tr>
</tbody>
</table>

Source: Krishnan, 1966.

Within the Gondwana sequence the Barakar and Raniganj Formations contain all the coal seams in this coalbelt. There are altogether eight regional coal seams in Barakar Formation whereas the Raniganj Formation contain ten regional coal seams. Besides, there are several local coal seams and split sections of the major coal seams in both the Formations. The Barakar seams range from 1-30 metres in thickness, while the Raniganj seams vary in thickness between 0.70 metres and 13.35 metres. Because of their greater thickness and occurrence nearer the surface, the Barakar seams are mostly mined by open cast methods in the western and north central parts. Underground mines are, however, more common within the Raniganj Formation in the eastern part.

In Raniganj coalbelt, only Barakar and Raniganj Formations are coal bearing. The Barakars contain seven persistent coal horizons along with a few local seams, while Raniganj Formation consists of ten regionally persistent coal horizons with some minor ones.
Laikdih, Brindabanpur and Dhamagaria (Salampur) seams are the thick coal seams in Barakar Formation whereas Upper Kajora, Jambad, Kenda-Chora and Samla are the prominent thick seams of Raniganj Formation (Dutta and Dutta, 1987).

Under the Gondwana system, there are Barakar series, Ironstone Shales, Raniganj series, and Panchet series.

**Barakar Series:** The name is derived from the Barakar river, which cuts across this stage in the Raniganj coalbelt. It consists of a thickness of 750 metres of white to fawn coloured sandstones and grits with occasional conglomerates and beds of shale in the Jharia coalfield. The sandstones often contain more or less decomposed feldspars. Because of their uneven hardness, the sandstones with a rough surface producing potholes in stream beds. This stage contains much carbonaceous matter in the form of streaks, lenticles and seams of coal.

**Barren Measures (Ironstone Shales):** The Barren Measures, which intervene between the Barakar and Raniganj series in the Jharia coalfield, are about 600 metres thick, being entirely barren of coal seams, but containing streaks of carbonaceous matter. They consist mostly of sandstones, which are somewhat less coarse than the Barakar type. They are present in the Raniganj coalbelt by the Ironstone shales whose thickness is about 420 metres.

**Raniganj Series:** This is typically developed in the Raniganj Coalbelt attaining a thickness of over 1000 metres. It is of about the same thickness in the Satpura area where it is known as the Bijori Stage, but is thinner (570 metres) in the Jharia coalfield. In the type area it consists of sandstones, shales and coal seams, the sandstones being definitely finer grained than those of the Barakar Series. Valuable coal seams occur in these strata only in the Raniganj coalfield. The coal is higher in volatiles and moisture than the Barakar coal, and there are certain seams like the Dishergarh, Poniati and Sanctoria seams, which yield excellent, long flame, seams coals.

**Panchet Series:** The sedimentary rock formations which comprise the Raniganj coalbelt - excluding the Recent and Subrecent alluvial and lateritic deposits - all belong to the Gondwana system (Gee, 1932).

In the Raniganj coalbelt, Permo-Carboniferous rock formations of Talcher, Barakar, Barren Measures, Raniganj and Panchet series are exposed at many places. The southern
boundary of the region is represented by a well-defined fault of an immense downthrow to the north, and has been carefully observed and recorded (Blanford, 1861).

In some areas of this belt such as Mangalpur, low hillocks not exceeding 30 metres in height formed of hard conglomerate bands and low lateritic hills are found. The vast period of time between the Archaeans and basal Gondwanas is unrepresented in the region.

2.14 COAL CHARACTERISTICS
The total coal bearing area of the Raniganj coalbelt, within West Bengal, is about 927.39 square kilometres in which there are 109 mines operating at present. The Barakar and Raniganj Measures contain fourteen coal seams of more than 1.2 metres thickness whereas the Raniganj Formation contains about twelve coal seams of thicknesses of more than 1.2 metres. However, some of the coal seams have split up into several sections in the eastern part.

The coal seams of Barakar Formation are generally low in moisture, medium to high volatile coking coals whereas coals of Raniganj Formation are of high moisture, high volatile, and non-coking type. Most of them contain high ash requiring beneficiation. The non-coking coals are usually of superior grades, but with limited reserves. Raniganj coal has some specific uses for specific industries for its heat efficiency.

Coal mining in the region is disturbed by tectonic movements resulting from the accommodation of stress (Basu, 1984). In the weak fault-plane zone, mining is risky and there remains the chances of land collapse.

The middle portion of this belt is traversed by a large number of faults. These are of a secondary nature, and are perpendicular to the Main Boundary Fault. Still, the coal here is not as disturbed as in the case of some Tertiary age coal in the Himalayas.

2.15 IN-SITU MATERIAL
The surface of the Raniganj coalbelt is generally covered with clay, in some cases alluvial but in other cases formed from withering of the rocks. In some places the rocks are exposed and patches of land are wholly unfit for cultivation. Cultivation is often done on low, gently sloping terraces of the sides of the numerous natural drainage channels.
(locally called *Jhor*). In the south, along the Damodar, there are narrow strips of land formed of alluvium.

*Gully erosion* is a common feature of the region (Lahiri-Dutt and Lahiri, 1999). The coal and overburden dumps, and the neighbouring agricultural lands are continually being eroded by numerous gullies. In view of indiscriminate dumping and poor environmental planning, quite a large amount of infiltration into the river system has been noticed. Dumping of sand meant for stowing the underground mines also takes up a large amount of land, and indirectly affects the quality of surrounding soil material. The soil pH values reveal significant spatial and temporal (between 1992-1995) variations (Lahiri-Dutt, 2000). Formation of gullies in opencast mines has also altered the fertility status of the soil (RoyChowdhury and Roy, 1989).

### 2.16 BACK GROUND OF THE POPULATION GROUP

The RCB inhabited by distinct communities; mainly local Bengalees, migrated people from Bihar, Uttar Pradesh mainly non Bengalees. Biharies came from the Chotanagpur plateau to work in coal mines of RCB. The labour freed from disused collieries was absorbed later in agricultural sector.

### 2.17 SOCIO ECONOMIC RESPONSES TO MINING

Since 1973 there has been a steady increase in coal production in RCB. With this increase in coal production there has been a marked demographic change in this area both the in urban and rural sectors. Present population is around 21 lakhs comprising local people both associated with the coal industry and agriculture, and migrated people mainly coming to join coal mining and related industries. Due to poor agriculture the population dependent on this sector became poorer compared to better economic condition of population engaged in mining industry. This economic disparity has created a kind of social imbalance in the region resulting in social unrest. Trade unionism and labour unrest are also not uncommon. As a response to mining, crime levels have gone up and moral values too have fallen. Illegal mining as well as various other petty crimes has become common.