POLITICS OF ECOLOGY : CASE STUDY OF BALCO HATAO ANDOLAN IN THE DISTRICT OF SAMBALPUR, ORISSA

Dissertation submitted to the Jawaharlal Nehru University in partial fulfilment of the requirements for the award of the Degree of

MASTER OF PHILOSOPHY

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Dedicated
to
my parents

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CERTIFICATE

Certified that the dissertation entitled **'POLITICS OF ECOLOGY: CASE STUDY OF BALCO HATAO ANDOLAN IN THE DISTRICT OF SAMBALPUR, ORISSA** submitted by **GOPINATH BISWAL** in partial fulfilment of the requirement for the award of **Master of Philosophy** of the University, is a bonafide and Original work to the best of our knowledge and may be placed before the examiners for evaluation. This dissertation has not been submitted to the award of any other degree of this University or of any other University.

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CONTENTS

CHAPTER I

INTRODUCTION

The civilisation of man is built around two of his greatest inventions - the plough and the wheel. the plough gave man freedom from hunger and the wheel, a means of quick transport. These two inventions have been refined so much that within a few thousand years, man has come to monopolise the management of all natural resources. But this managerial monopoly has brought him to the brink, of an ecological disaster which in its sweep could endanger his own survival. A new holistic approach to management of all natural resources is being vigorously advocated. There is mountainous evidence to show that huge projects, irrigational and industrial provide to man only a very short lived relief. In the long run, each project disturbs the ecology of the area it serves so much that clean water, clean air, and healthy food cannot be taken for granted : The bioresources as also other natural resources suffer irreparably. So much so, human progress at what cost has become the central theme of the debate raging through the whole informed world.

The industrial revolution that was ushered in through the last quarter of 18th century and progressed at an ever-increasing pace through 19th and 20th centuries proved to be a vital factor in the upgradation of consumerism and consequent degradation of environment. The two progresses moved along a collision course, with almost identical speed. The economic and political fall outs of that revolution unleashed forces that could grapple with those problems somewhat successfully. But it took a very long time, almost not until into the seventh decade of this century, to understand the harm the industrial revolution did to the environment. Mounting world wide concern for accelerated exploitation of resources for development, led to the holding of UN conference on Human Environment in Stockholm in 1972.

Environment and development issues and the Links between them are of vital significance. "It is essential to have a close understanding of the relationship between environment and development for the formulation and implementation of any strategy that safeguards all concerned aspects. Therefore, the theme environment and Development; prespectives and imperatives is of vital concern, which claims the attention of the scientists. The perspective provides a vista and a vision of environment and the imperative

calls for action that may bring true equillibrium between environment and development, between ecology and man and thereby improve the quality of life and the quality of environment." (Mehdi Raza, 1992, pg.39).

But the accelerating space and changing character of human impact on environment is alarming. At the global level, there is debate over what constitute the most urgent problems. The problem could be spelt out in the modern way of life which cannot be sustained without an industrial base. Yet the fact that industrial activity spells, doom to environmental quality and cannot be ignored. Development now has come to mean installation on pollution regulating units side by side with industrial units, especially those which produce or consume chemicals of all kinds, so that the water and air are left untouched by contamination of any kind. Often, the effects of contamination are insidious. The examples of DDT and CFCs come to the mind. Not for years since they began to be employed, their harmful impact on the biological food chain and stratosphere had become visible. But in the meanwhile, they caused enormous damage. The Bhopal tragedy in our own country opened the eyes of Government that was over anxious to produce chemicals basic to manufacture pesticides : if only there had been an appraisal of the possible consequences of an

accidental leakage of methyl isocyanide, that tragedy could have been possibly averted.

The global debate that is going on is seized of this dilemma. Vested interest are not prepared to stop exploitation of natural resources nor are they willing to order closure of industrial units with a potential for destruction of the environment.

There are certain priority areas or themes at global level that need to be emphasised : these are (1) sustainable use and conservation of resources (2) Preservation of nature/environment (3) Prevention of pollution (4) Control over population growth (Mehdi Raza, 1992). The primary motivation for development is human welfare, which is also the primary motivation for environmental quality. thus,"the two motivations converge and not conflict, thereby rejecting the false dichotomy between environment and development. this should therefore, encourage the search for optimal harmoneous relationship between environment and development." (M Raza, 1992; pg.40). therefore, the main issue pointed out in the (Bruntland Commission Report, 1987) about poverty in the developing countries international inequality, sustainability of development are basic issues involved in the theme of "Environment and Development." Proper management of the natural resource base is especially important in developing

countries, because these countries can least afford the opportunity costs of irreversible loss of their renewable natural resources, or efforts to remedy environmental damage. All the same, the new awareness had stirred the conscience of man. Through the last twenty years, public opinion had asserted itself so much that Governments the world over have started looking beyond the immediate future. The environmental movements in India and the response of the Government to this strong and enlightened public opinion, It is in this context that, an attempt has been made to study the politics of Ecology with reference to BALCO project in Bargarh District of Orissa.

In the second chapter an attempt has been made to analyse the social-economic profile of the Paikmal Block and its geographical and climatic condition. Third chapter deals with the aspects of political history of BALCO project. The process of how its withddrawal had taken place, have been discussed. IN chapter four, Mineral Policies and Environmental issues have been discussed and examined so as to locate it in the context of BALCO Project and the Andolan. Chapter fifth, deals with peoples' perception on environment and development. In the final chapter a conclusion has been drawn by bringing into focus once again about mineral policy, environment and development.

CHAPTER II

SOCIO-ECONOMIC PROFILE OF THE PAIKMAL BLOCK IN THE DISTRICT OF BARGARH (ORISSA)

This is a synchronic survey of Paikmal block in the Sambalpur district and Paikmal block in Orissa. Various indicators of socio-economic developments of this area are projected in narrative details. Therefore, the study of the overall economic activities, here, will be essentially descriptive.

This profile includes a description of its geography and topography, climatic conditions, rivers, flora and fauna and mineral resources etc. with an account of infrastructural facilities classified broadly into (a) communications, (b) productive uses of land and industry etc.

The objective of the profile of this region is on the one hand, a description of natural resources that helps one to identify the potentials for development and on the other, an account of infrastructural facilities indicates the actual levels of transformation of this potential undergone in the region. These two distinct processes are mediated by demographic features, occupational patterns, social stratification such as caste, class, religion and so

on, alongwith the administrative setup and political activity in the region. This cataloguing is perhaps not exhaustive but it may suggest some general and specific trends of development in the area under study.

Situational Context

The Gandhamardan Hills including the reserved forest cover an area of around 84 sq. miles, situated between 83° N latitude and 21° E longitude on the border of Sambalpur Bolangir and Kalahandi district in Orissa, a part of Western Orissa bordering Madhya Pradesh (indicated in the Map). The Gandhamardan Bauxite deposit area is bounded by latitude 20° 50" N to 20° 55" N and longitudes 82° 45' E to 80° 5'30" E. The headquarters of the bauxite project is located at Paikmal block on the Sambalpur side. Paikmal block is located in the Padampur Sub-division of Sambalpur district. However, the Janata Dal Government recreated several new districts during 1992 and 1994. According to this order, the Sambalpur district was sub-divided into four districts such as Bargarh, Deogarh, Jharsuguda and Sambalpur for the purpose of administrative convenience. At present Paikmal block comes under Bargarh district.

The present Gandhamardan is known as "Gandhagiri" in mythology and believed to be the "Gandhamardana" of

the Ramayana. The hill is proved according to the historians to be the famous "Parimalgiri" of the Budhist literature, a plateau on which there was an international centre of learning called "Parimalgiri Mahavihara".

There are two ancient temples on the northern and southern foothills - Nrusinghanath in Sambalpur and Harishankar in Bolangir side near two perennial streams. The water of which is believed to be sacred. People from the Chhatishgarh area of Madhya Pradesh come to throw the bones of their dead elders into the Nrusinghanath stream called the"Papaharan Tirth" (water that washes the sins).

Climatology

Winter in this region starts in November and continues till middle of February when summer comes in and continues upto the end of June. The rainy season begins in July and continues upto the end of September. The month of October and part of November also experience some rains.

The maximum precipitation occurs during the rainy season from the south-west monsoon. Premonsoon showers are experienced in the month of June. January and March also experience occasional rains. Data regarding the Annual rainfall at Paikmal for the past few years

is indicated in Table 1 below. These figures suggest about the unusual rain situation in the region, perhaps due to this reason that the region is dependent on water sources from the streams/springs for cultivation and domestic use.

Table 1: Annual Rainfall at Paikmal

Year	Rainfall in mm
1970	1750.70
1971	1172.00
1972	1132.70
1973	1763.80
1974	1025.20
1975	1106.10
1976	1586.50
1977	1314.90
1978	1190.30
1979	990.75
1980	2107.75
1981	1620.80

Source: Block Development Officer, Paikmal.

The maximum temperature in summer varies from 43° to 45°C. However, the temperature drops after the monsoon arrives. The winter is coldest in December with minimum temperature of 6° to 7°C.

Water Sources

The richness of this system is remarkable for its water resources, with about 151 springs (both perennial and semi-perennials) and many more monsoonic ones which feed the water into 22 streams joining two rivers "Ong and Suktel", feeding the river Mahanadi (Mother river) of the State. Three streams on their way downhill on the northern slope form four waterfalls of 30-40 feet height. The water requirement of 50,000 people and 7 minor irrigation projects are met by these streams. Although Sambalpur district is highly benefited by the multipurpose Hirakud Dam, it does not have economic importance in the drought prone area of Padampur sub-division in general and Paikmal block in particular. In view of the scarcity of water in the region and considering the generally low rainfall recorded in the area several minor irrigation projects have been constructed over the streams by the State Government. The salient features of the minor irrigation projects constructed over the streams are indicated in Table 2. The Durgei Jharan MIP was constructed at the BALCO's cost mainly to provide waters to BALCO's industrial complex and township area.

Table 2: Important Minor Irrigation Projects

Name of the Project	Type of Project	Catchment Sq/miles	Flow	Area cover for for irrigation (in ha) Khariff	Ravi
Sambalpur side					
Narasinghnath	Diversion water	3.5	Perrennial	764.63	160.63
Khandijharan	Reservoir	5.75	Semi-perennial	1110	450
Gupteswar	Diversionweir	4.0	Perennial	370	207
Durgei Jharan	Reservoir	1.75	Semi-perennial	300	-
Bolangir Side					
Bhagjharan	Reservoir	4.2	Perennial	1000	400
Harishankar	Diversion water	1.2	Perennial	400	300
Resamunda	Reservoir	5.6	Semi-perennial	787	190

Due to irregular and generally low rainfall experienced in the region and poor flow of stream during summer, the neighbouring villages have been provided with tube wells for meeting their domestic drinking water facilities. A total of 128 villages in Paikmal block have almost 175 tubewells installed by state public health department. There are 7 lift irrigation points and 26 canals for agricultural facilities.

Forest, Flora and Fauna

The Gandhamardan hills range form part of a rich evergreen forest covers an area of around 56,734

hectares. The total forest area (including hill slopes) covers around 20,000 hectares. The forest is rich in valuable trees like sisu, sal, piasal etc. useful in construction works. Among its minor forest produce are kendu leaves, Mahua, Sal seeds, Char, Amla. Many kinds of roots and shoots used as staple food. The staple food from the forest necessarily consists of Bamboo shoots which are available in abundance throughout the hills When the bamboos mature and the shoots become scarce, the people turn to a host of fruits and flowers. It is this wide range of food and fruits that perhaps lead to the forest being called Madhuban in the local parlance. The forest is a source of livelihood for the local people. Collecting the minor forest produce and selling them in the local market is an established source of livelihood for the people. Some of them are employed as daily wage labourers under local contractors working in the block which includes both forestry work and construction work. Forestry work in the surrounding region includes that of forest leased out to the Birla Orient Paper Mills for the collection of bamboo and the work conducted by Orissa Forest Corporation itself.

The forest provides seasonal employment to the local people particularly to the landless and the marginal farmers. Some of their seasonal employment

and income come from the bamboo works, broom manufacturing, manufacturing mat from palm leaves etc.

Among other things Gandhamardan is also famous for its medicinal plants. A survey done by the Botanical Survey of India in the late 50s listed 2700 plant species of which 125 plants are of significant medicinal value. Some of them are rare plants, 220 quasi-medicinal and economically important plants. On the banks of the streams varieties of ferns are seen and numerous species of Bryophytes and lichens grow in the wet and dry areas respectively. It is due to the existence of rich medicinal herbs and plants perhaps that there are two Ayurvedic Colleges on each side of the Hills are situated.

The forest area has a few human habitation inside due to the absence of habitable valleys, but is surrounded by the villages and towns of Jharbandh, Paikmal, Padampur and Gaisilet blocks of Bargarh district on the north-eastern side.

It is known from the local people and forest department sources that animal species even though not yet systematically surveyed, are known to constitute mammals like tiger, leopard, sloth bear, palm-civet, jungle cat, wild boar, mouse deer, sambar barking deer, fox, hover, jackal, wild dogs, red and black monkeys,

bats andpercupines. A number of bird species including peacocks, wild fowl and parrot, a number of vampires and other reptiles, numerous species of insects, warms and snails are also seen in this forest.

Table 3: Paikmal Block

Total area of the villages	45,080.04	hects
Forest area	6,802.40	"
Area not available for cultivation	4,139.14	"
Land put to non-agricultural use	28,096.56	"
Cultivable waste (including pasture and grazing land)	4,774.89	"
Irrigated area by source	1,267.05	"
Gross cropped area including fruits	N.A.	
Total geographic area of Gandhamardan Hills	56,734.00	hects
Total forest area (including Hill slopes)	20,000.00	"
Total irrigated area by source		
Khariff	2,544.00	hects
Rabi	717.00	"
Multiple cropping adopted		
Kharif	31,163	hects
Rabi	2,416	hects
Others	25	hects
Total	33,604	hects

Source: District Census Notebook, 1981.

Mineral Resources

In so far as the contribution of minerals to the economy of the Padampur sub-division in general and the Paikmal block in particular is concerned, there is no mining activities even minor or major, metallic or non-metallic whatever it may be. However, patches of graphite stones generalised for gun powder are found here, and on the Gandhamardan hills. People of the region occasionally collect it and sell it out to the businessmen. In 1971, the Govt. of India officially announced the existence of bauxite deposits in Gandhamardan in a Gazette Notification of the total estimated bauxite reserves of the country (2600 million tonnes the latest). More than 50 percent are in Orissa. Gandhamardan itself has about 213 million tonnes.

Demographic Features

The Gandhamardan Hills fall within under-developed region of Sambalpur on one side and Bolangir on the other. The area is marked by the absence of any major or minor industry and is inhabited by mixed population of rural and tribal class. Although the official accounts about the rate of urbanisation is not available, it is generally found that the trend of urbanisation in this region is minimal. the Bargarh district is one of the moderately populous district in

the Orissa State with a population of 12,07,172 as per 1991 Census representing nearly 3.9 percent of the total population of the State. The density of the population in the district is 207/sq.km. Nearly 93.32 percent of the population live in rural areas. There are three towns (statutory, Municipalities and NACs) as per 1991 Census. Padampur town is nearest to Paikmal with a distance of 20 km. Even though the official ratings of the degree of urbanisation in the district in terms of rank is not available, the low level of urbanisation indicates some general trends of the area.

The scheduled caste population constitute 18.4 percent and the schedule tribe population 19.55% to the total population of the district. In so far as literacy rate of the district is concerned, nearly 40.3 percent of the population is literate, percentage of male literate is 67.6 percent and female 32.4 percent respectively.

Out of the total number of blocks (that is 12 blocks) in the district, Paikmal is one having a sizeable population of 87,704, that constitutes 7.2 percent of the total population in the district. Paikmal has been taken as one of the tribal block by the Govt. of Orissa (of the total 5 tribal pocket in the district). The Paikmal area is inhabited by 128

villages. As mentioned before, the region is inhabited by a mixed population of rural and tribal. The scheduled caste population constitute 13.9 percent and scheduled tribe 37.1 percent respectively in the block. Total literacy rate in the block is 32 percent male literacy 23.1 and female 8.8 percent. Data regarding this profile is indicated in Table 4.

Table 4:

1991 Census	District Bargarh			Paikmal Block		
	Person	Male	Female	Person	Male	Female
Population Total	12,07,172	6,09,916	5,97,256	87,704	43,665	44,039
Rural	11,26,625	5,67,990	5,58,635	87,704	N.A.	N.A.
Urban	80,547	41,926	38,621	Nil	N.A.	N.A.
Scheduled Caste	2,22,562	N.A.	N.A.	12,190	N.A.	N.A.
Scheduled Tribe	2,36,072	N.A.	N.A.	32,613	N.A.	N.A.
Literacy	4,86,615	3,28,801	1,57,814	28,097	20,298	7,799
	40.3%	67.6%	32.4%	32.0%	23.1%	8.8%

Source: District Statistical handbook; Sambalpur, 1992

According to official statistics about 42.16 percent of the population is classified as work force in the district, whereas in the Paikmal block the percentage of work force constitutes 23.98 percent of the total population. Of them 89.5 percent are cultivators and agricultural labourers, 10.4 percent are under the work force of allied agricultural

activities, cottage industries and trade and commerce. It can be seen from the Table 5 given below that the dependence of workers on agriculture is maximum, but given the low irrigation facilities and limited cultivation (as shown in the table of land holding pattern) these figures do not actually convey the reality. In this case, it seems that there is ample scope for labour intensive schemes in the region. So far as the block is concerned, the dependence of the population on forest both for food and livelihood for most part of the year is a reality. This is due to the reason that an overwhelming majority of the people classified as cultivators cannot sustain themselves by cultivation for more than six months. From November to April the case is worse for the agricultural labour. Main crops produced in the region are rice, moong, groundnut, till, mustard etc.

Table 5: Land holding pattern in Paikmal block

1.	Less than 1 hectare	5,007 persons	
2.	1 to 2 hectares	4,308 "	
3.	4 to 10 hectares	750 "	
4.	Above 10 hectares	1,321 "	
5.	Others	18,136 "	
	Total	69,568 "	7.9%
	Total persons	20.67%	

It reflects the general trends of the block.

Table 5: Occupational Pattern of District (1991 Census)

Sl.No.	Category	Bargarh Number of workers	Percentage of total population/total workers
1.	Total workers	5,08,952	42.16
2.	Main workers	4,26,034	42.16
3.	Marginal workers	82,918	
4.	Cultivators	1,93,876	90.6
5.	Agricultural labours	1,39,873	86.15
6.	Non-workers	6,47,542	53.64
Paikmal			
1.	Total workers	21,039	
2.	Cultivators	15,580	
3.	Agricultural labour	3,252	
4.	Allied Agricultural activities	45	
5.	Cottage industries	995	
6.	Trade and commerce	1,167	

Source: 1) BDO, Paikmal

2) District Statistical Handbook, 1992, Sambalpur

Infrastructural Facilities

While looking at this aspect, one can arrive at some understanding about the level of development in

the area. Development programmes and plans depend to a significant degree on the availability of infrastructural facilities. It is well known that a good communications network is vital for the rapid growth of the economy in a particular area. Because the transportation of goods and mobility of manpower speed up by a good communication facilities such as Railways, roads, electricity, telecommunications etc.

Communication Networks

Compared to its overall economic and other activities the Paikmal block and the Padampur region in the district remains underdeveloped with regard to the railway communications. Paikmal is approachable from Khariar Road on the Raipur-Waltier rail link followed by a fifty kilometers road journey. Raipur is the nearest airport from where Paikmal is more than two hours drive. Jharsuguda on the Bilaspur-Howrah rail link is another approach point with 240 km road journey upto Paikmal via Sambalpur-Bargarh-Padampur. Nearest railway station is Nuapara from Kalahandi district side with a distance of 29 km from Paikmal. The State Highway No. 3 connecting Paikmal to Padampur on the east and Nuapara on the west passes close to the plateau of Gandhamardan Hills.

The total number of inhabited villages in the block is 128. Out of that pucca road passes through 20 villages and105 villages having approach road which is kutcha. 78 villages in the block are provided with electrification. So far the post and telegraph facilities are concerned, there is one Post and Telegraph Office at Paikmal Basti and other Post and Telegraph at MandosilBasti with a distance of 15 km from each other places.

Among other things the region is strikingly backward in the field of education. There are one to two primary schools for every thousand persons.

The situation is worse in case of middle and higher schools. The table regarding the level of educational facilities etc. are set out below:-

Table 7:

1.	Primary school per thousand of population	1.3%
2.	ME school per thousand of population	1.2%
3.	Secondary school	0.17%
4.	Colleges for general education	0.02%
5.	Medical College (Ayurvedic)	0.01%
6.	Population served per Medical (including seats for patients)	22,000
7.	Technical College	Nil

The overall economic performance of a region is also influenced by the available technical and financial facilities. It is seen that in Paikmal block as far as the technical organisations such as veterinary services, fisheries and dairy works etc. are concerned show a very low level of activities. Very few people are involved in fisheries and personal cows for milking as a supplement to their minimum incomes. There is no other organised fisheries and dairy works seen in the area. The region does not contain sufficient grazing and pasture land because of the forest coverage and patches of waste/barren land/grove etc. and rocky land here and there in the plateau. In Paikmal block there are two veterinary hospitals alongwith 5 other livestock inspector centres at various places. This above information suggests the peoples' involvement in economic activities.

In addition there is no major trade and commerce and important crafts seen in the area. The newly created Bargarh district is well-developed in terms of modern industries and rice production in the State of Orissa. But it is interesting to note that the important production units of the district are confined mainly at the Bargarh town. The lopsided development at the district clearly demarcates between the two sub-divisions such as one is Bargarh and the other the

Padampur sub-divisions in terms of industrial development.

Some of the important production units of the district are mentioned below:-

1.	Handlook and silk cloth	Bargarh
2.	Cement factory and works	"
3.	Sugar factory	"
4.	ABS Sp;inning Mills	"
5.	Oil extraction plants	"
6.	Agro-manure factories	"
7.	Rice-meals (Large) (RCMS)	"
8.	Iron works	"
9.	Distillery works	"

Banking facilities in the Paikmal block includes four commercial banks, four co-operative societies and five rural banks for the purpose of providing banking facilities and other kind of loans to the local people. Commercial banks basically operate in terms of monetary transactions of small business class people and the governmental loans under various schemes of State Government such as IRRP, IRDP etc. The cooperative societies and the raral banks on the other hand provides loan facilities in the form of manure and fertilisers, seeds for cultivations and other kind of agricultural facilities to the local farmers. There

are so far two regulated markets (i.e. the market regulated by theNotified Area Council (NAC), Padampur), one at Paikmal and the other at Mandosil and also there are 7 other unregulated markets existing in the Paikmal block. Generally, the market activities are undertaken by the tribal, the landless and the poor people of the area who seasonally collect the minor forest products and sell them out in the local markets to the agents of the traders to buy their regular needs. The forest provides seasonal employment to the local people, particularly to the tribals, the landless and the marginal farmers of some castes. In relation to peoples' subsistence some of their seasonal employment, income and production include the activities such as Bamboo works (i.e. manufacturing of baskets etc.) broom manufacturing, manufacturing of mats from palm leaves, collecting kendu, char, mahua, mahul and kendu leaves, some kinds of medicinal flowers, leaves shoots etc.

Apart from irregular sources of employment, government developmental and welfare projects are also a source of employment. Integrated Rural Development Programme (IRDP), the Rural Landless Employment Guarantee Programme (RLEGP), Employment Assurance Scheme (EAS) for providing employment to the labour class for 200 days a year and various other central and State sponsored programmes are in force in the block.

The block being one of the tribal dominated area a special programme for the tribal called MADA is also in operation, which provides 50% grant to the tribal out of the total developmental scheme. But there is hardly any impact. For example, in 1985-86, ERRP covered only 100 out of the 600 people identified in Paikmal. But according to the local politicians, sarpanch, the programmes were miserably failed. During the field work tour the scholar met several rural people including tribals of some villages, asked them about the government developmental schemes whether they get any benefit out of it. Some of the them expressed that no governmental officials visit their villages, getting a loan under the Jawahar Rozgar Yojana is a distance dream for them. This essentially indicates that, the real benefit of the welfare schemes of the government do not reach the real needy people. The case of Mayadhar Bhoi, a 36 year old Kandh tribe of Kudherphasa village is a good illustration of the life and living style of the adivasis in the area. He has 7 family members including his mother and himself works as a labourer, having an archard of mangao, narangi etc. He owns a 2-acres of unirrigated land. He explained that most part of the years they live on forest products by collecting medicinal roots, fruits and sell them in the market. This typical case is a telling example of the backwardness of the area. In this background the

benefit of public distribution systems do not have any significance so to say. Details about the survey of public distribution system in the block could not be done. It includes the distribution of sugar, wheat, rice and kerosene oil, provided the few numbers of the units of the PDS, the benefit goes to a few people. It is due to this background that the BALCO project raised many apprehensions in the minds of the people. Environmental degradation can reduce their meager water resources and restrict them to have access to their source of livelihood in the forest to which they call their "Mother and Father".

CHAPTER III

POLITICAL HISTORY OF THE BALCO HATAO ANDOLAN IN THE CONTEXT OF BALCO PROJECT PROPOSAL AND THE WITHDRAWAL OF THE PROJECT

During the past twenty years, people in various regions of India have taken action to protect their environment, their livelihood and their ways of life. These environmental movements have emerged from the Himalayan regions of Uttar Pradesh to the tropical forests of Kerala and from Gujrat to Tripura in response to developmental projects that threaten to dislocate people and to affect their basic human rights to land, water, and ecological stability of life-support system. However, these newly emerging arena of political struggle share certain common features, such as democratic values and decentralised decision making and slowly progressing towards defining a model of development to replace the current resource-intensive one that has created severe ecological instability. BALCO Hatao Andolan in Orissa is a case in point where the youth organisations and tribal people in the Gandhamardan Hills, whose survival is threatened by development of bauxite deposits, have initiated such kind of political struggle for safeguarding the interest of the poor and the marginalised among who are women, tribals and peasants.

In order to understand the politics of the people to save the Gandhamardan ecology in the Sambalpur (Bargarh) district in Orisa and in the context of BALCO project proposal, an attempt has been made in this chapter to cover the period from early 1965 to 1990. Though the movement began specifically in 1983 and picked up thereafter reaching its high point in 1986, certain political developments in the region cannot be separated from the discussion. The antecedent of the movement such as the Chiroli Dam Project issue and the organisational activities of non-governmental organisations such as OXFAM, have a bearing on the nature and direction of the movement.

As far as the activists of the movement are concerned, there were two major organisations operating during the time. The first was called Gandhamardan Surakshya Yuva Parishad (GSVP) consisting of people from various social and ideological groups who joined at different point of time. The people involved in this organisation were a group associated with the Hind Mazdoor Kishan Parishad, Chhatra Yuva Sangharsh Bahini (a group of Jayaprakash Narayan followers), students and scholars from Sambalpur University (who initially came as part of an NSS camp to the area but later stayed back), students of the Ayurvedic College, the

youth of local villages, the tribals and the dalits of the region.

The second group was spearheaded by the Vishwa Hindu Parishad. The organisation known as Nrusinghnath and Harishankar Shangharsh Samiti became active with the sole aim of protecting the religious place. The organisation primarily took interest in preserving the Temple and the streams which are considered to be sacred and known as "Papaharan Tirth". Thus, the organisation's activities did not go beyond filling a writ petition in the High Court and for few months involved with GSYP and then seemed to be silent.

All the informations, facts and events incorporated in this chapter are based on the data collected by the scholar during the field work undertaken in the region. The data were collected from both primary and secondary sources, and include interviews with leaders, activists, the tribals and the local people and the intellectuals involved in the movement, the newspapers and leaflets, reports of the various committees, voluntary action groups, and findings of the study teams etc.

The region has been known for its socio-economic under-development for a long period of time. The commercial exploitation of the Gandhamardan area dates

back to the pre-independence period by local business communities and the Orient Paper Mills with forest development approval, but no conspicuous deterioration was noted in the official records of Khariar Forest division. The percentage of forest area of Padampur sub-division of Sambalpur district according to the working plan of Khariar Forest division is only 17.63% of the geographical area against the target of the target of 33.3% as envisaged in Indian Forest Policy of 1952. Despite the deterioration and degradation, it is observed, no afforestation measures have been taken up in this drought prone area either by the State government or by the Government of India to make good the shortfall of the balance 16% of forest area as per the said forest policy. The first major indication of threat to this ecosystem began during 1971 with a Gazette Notification of the Government of India that about 213 million tonnes of easilyexploitable quality bauxite-alumina was stored in this hill.

Dating back to the year 1965, the Government of Orissa had proposed to set up a Dam in the region. In 1966, the late Prime Minister, Mrs. Indira Gandhi visited the region to take stock of the frequent drought situation. The irrigation project, albeit not a big Dam project, had an expectation level of providing irrigation facilities to about two and a half

lakh acres of unirrigated land in some part of Bargarh and Padampur sub-division.[1]

On the Balangir side of the hills, the river ONG begins near the Benerapani region and flows through the bordering village of Menakamunda of undivided Sambalpur district. Adjacent to the Tapar village about 20 km distance from the source of the river Ong the Chiroli region is situated. Parts of the land in the region are irrigated by the two tributaries of the Gandhamardan hills, Ong and Suktel, and the streams which flow from the hills.

The Chiroli Dam project became uncertain partly because of the government's inaction and the local leaders'apathetic attitude towards the cause of the people. The common people and the peasants alleged that due to the personal interest of the local Congress leader in the opening of the project, it was not being allowed in the region.[2] In 1967, the non-Congress coalition government was formed in the Orissa State. In 1977, the Janata Dal lost both in the centre and at the State. The apparent indifference and inaction of the local political and social activists who were mobilising peoples for this Dam seems to be mysterious for this long period of time. In 1980, the Congress party came back to power in the State. The local

Janata Dal leaders overnight raised up the issue of demanding the Chiroli Dam. Public opinion was generated and meetings were organized among the peasants. This culminated in the formation of the Chiroli Dam Sangharsh Samiti.[3] However, the Samiti could not establish a mass support base and organisations. Meanwhile, the BALCO project issue came to the forefront. The BALCO (Bharat Aluminium Company Ltd.), a Govt. of India undertaking which has been busy in mining bauxite and producing alumina in the adjoining Korba hills of Madhya Pradesh for the last couple of years applied for a mining lease for the exploitation of bauxite deposits in the Gandhamardan hills in 1976. The Govt. of Orissa sanctioned the lease to BALCO on 11th September 1981.[4] There was no organisational connection between the Chiroli Sangharsh Samiti and the GSYP. Though the leading members of the Chiroli Sangharsh Samiti got mixed up with BALCO Hatao Andolan, the issues about the bauxite mining project did not draw any attention before. Later, the people had an apprehension that if Gandhamardan was not saved the Chiroli Dam would be in vain due to the fact that mining in the hills would cause a shortage of water in the streams and the rivers. The people, therefore, joined their hands with the BALCO Hatao Andholan. The government had proposed an alternative irrigation project near the village of Pujaripali about 15 km

distance from the Chiroli region. The Samiti members opposed this proposal on the ground that the project would not benefit the drought prone area except for a small portion to be covered by irrigation.

During the mid-1980s, a non-governmental organisation OXFAM had already established its network in the region. This organisation basically sought to educate and organise the rural masses including marginalised sections of society, made landless labourers and tribals aware of their rights and the existing legal provisions for their protection. An organisation called the Shramik Chetna Sangh was formed under the leadership of local youths. Another organisation, the Mazdoor Kishan Parishad also came up at about thistime. The people collectively raised their voice against corruption and exploitation by the Government officials, local contractors, and the feudal class. The activities had generated a sharp reaction among the government officials, local elites and the feudal classes. They opposed it vehemently, sometimes taking resort to forceful means against the OXFAM people. The OXFAM subsequently had to leave the region. The organisations operating under the local leadership became defunct due to lack of sponsored fund and other problems. However, the legacy left behind by OXFAM worked as a foundation stone of the BALCO andolan

activists. The mobilisation techniques and the consciousness generated among the people drew attention toward BALCO Hatao Andolan. The volunteers and the local leaders thrown up at this time took part in the Andolan actively.

The implementation of the project began based on government's sanction and provisional clearance from the Department of Environment and no objection from the government of Orisa. The lease was sanctioned considering the block No. 7,8, 9, 10 of the hills which are rich in bauxite reserves.[5] Initially, certain sections of the people specifically from Padampur area, who were also involved in social and political activities,had perceived the project to be harmful and negative, whereas the project seemed attractive over the unemployment situation in the region. The spirit of the 1980 students' movement[6] was very much alive among the students of Padampur Anchal College. The BALCO's mining project was signalled by the protest of the local people. In May 1983, when the then Congress Chief Minister arrived at the site to lay its foundation stone, he was greeted by violent demonstrations from the local people and the college students who feared the project would not only destroy their sources of livelihood but also their religion and culture. The agitation took a violent form followed by

police lathi charge. During the protest, some 16 people were injured, some 20 odd vehicles burnt down. The protest was suppressed by the police.[7] The pamphlets circulated on the occasion claimed this project as nationally important for the socio-economic development of the villages around the hills by providing facilities for electrification, housing, food preservation, packaging, defence and space projects also providing employment to 500 people. This pamphlet also stressed the provision for environmental protection of Rs. 15 lakhs per year by BALCO. Massive government projects in rural India are supposed to generate enthusiasm and excitement because of their promise of job opportunities and economic development. And politicians usually stumble over one another in claiming credit for these schemes. But in case of BALCO's bauxite mining project, the opposite is true. The people's discontent and protest alongwith very many grievances and allegations continued to dominate the issue regarding the project.

A handful of people believing in socialist principles, who were earlier also involved in social activities in the region, took up the issue and began to make the people conscious about the adverse impact of the bauxite project. Regular meetings were organised at various places from August to October 1983.[8] Jaya

Prakash Jayanti celebrations took place in order to generate public opinion about the project. On 16th August, meetings were held at the villages of Manbhang, Lukupali, Bikramnagar, and Manikel. The issues regarding the BALCO project were discussed amongst the villagers. At night a mass meeting was called at Mithapali village, but the meeting was not successful, as the common people did not participate for the fear of repressive measures by the police. In Septermber, a handful of activists initiated peoples' awareness generation programmes at Paikmal and Jharbandh blocks about the future consequences of the mining project.[9] At the initial phase, the meeting at Jamsed village was remarkable. On 2nd October 1983, Gandhi Jayanti samaroha took place, on this occasion the participants, although sizeable in number, took a pledge to launch a systematic struggle against the BALCO project at Gandhamardan. As follow-up action on 12th October, a delegation was sent to the Collector of Sambalpur to submit a memorandum demanding the withdrawal of the project.[10]

The BALCO Hatao Sangharsh Samiti was formed at the first week of January 1984. At this stage the organisation did not succeed in generating anti-BALCO stir.[11] Even the Nrusinghanath and Harishankar Sangharsh Samiti emerged during this time could not

have been able to mobilise the mass of people. With their limited manpower and support in March, Paikmal Block office was gheraoed in protest against the Bauxite project. Later on, in December the advocate involved with the VHP and supported by the VHP filed a petition against BALCO authority in the Orissa High Court. The High Court issued a summons to the representatives of BALCO to attend the Court. When BALCO did not comply with the summons, a stay order was put on the progress of BALCO's construction works on 21st January, 1985. On 13th February 1985, BALCO submitted an appeal in the High Court in order to allow it to resume its work against the stay order. BALCO made a pledge in its appeal that in no circumstances would the operation destroy the ecology, flora and fauna of the area and the religious shrines. The work started again and the heavy machine operation caused vibrations by blasting due to which the religious Garud Pillar was uprooted.[12] Against this damage the Nrusinghanath and Harishankar Sangharsh Samiti again filed a petition against the BALCO in the Orissa High Court, mentioning BALCO's disobedience to the previous agreement. By May 1984, all other formalities regarding the project under the Mines Act and Mineral Concession Rules were completed. In the same year, from 7th to 16 of June a signature campaign was

undertaken in the villages. Alongwith the signatures a memorandum was submitted to the BDO of Paikmal and the SDO of Padampur regarding the peoples' dissatisfaction with the project.[13]

Meanwhile, the other groups broadened its base and began to form village committees. Till the middle of 1985 there was an apparent lull. BALCO went on with erection of infrastructures at the same time the activists went on collecting information, organising the people. Along with the work on creating infrastructures facilities the work on the mine development and the construction of the ore crushing plant also began, as part of mine development test mining was undertaken.

During June 1985, World Environment Day was celebrated in the region as part of making people conscious about their environment and ecology. A group of National Service Scheme (NSS) volunteers from Sambalpur University camped at Nrusinghanath. The volunteers went to villages and placed themselves in selected families to understand peoples' reactions more clearly. The volunteers were selected from both student6s and the non-students. The latter were selected from the local youth among who had earlier experience in mobilising and organising people.[14] The selected nine villages close to the hills include the

villages of Manbhang, Kudherphasa, Mithapali, Koknara, Paikmal, Jharbandh, Purnea, Cherengajhanj and Gurunda. The volunteers, both men and women, adopted the life style of the ordinary village people. The families were selected from the landless labourers and the tribals. The volunteers did not disclose their intentions, they took the same food with the families, the female volunteers engaged in cooking, went to the field to participate in earth works and labour works. Subsequently, they came up with their respective reports about people and their response towards the BALCO project. Through their respective experiences they found that the people had very closely monitored the consequences in terms of the cutting down of trees, which were their source of income and livelihood. The people were also very conscious about the overburden due to construction of road and mining on the hill top, depletion of water at the streams and so on. But out of innocence and fear they had no courage to openly come out with their grievances. One of the volunteer of the group, Niranjan Bidrahi, explained, "people were first terrified to come out in the open against BALCO fearing they would drop bombs. Nobody even raised a voice as some musclemen of a local Congress (I) leader supporting BALCO threatened to teach them less on."[15] The volunteers now got confidence to organise these

people. After the camp was over, some volunteers stayed there with the villagers and the adivasis opened their heart. Niranjan of the Chhatra Yuva Sangharsh Vahini, Prasanna, an Arya Samajist, Gautam, a student of local Ayurvedic College lived in a hut with the adivasis, spent several months involved in convincing people and organised them to fight for their rights. The volunteers managed to live by begging a handful of rice which was called Musti Bhikshya, collected from the villagers. Later, the village youth joined hands with the activists. Now the struggle began to take a new turn. This handful of activists formed an organisation called as Gandhamardan Surakshya Yuva Parishad at Paikmal on 10th August 1985, under the convenorship of Niranjan Vidrohi.[16] The central parishad consist of six members all of them young.

At the outset, the village people dared not come out of their houses to talk to the activists. Gradually, however, they were convinced and joined the GSYP on a massive scale. All other groups merged with GSYP and fought against the project collectively. Later, because of criticism from certain sections of the people that the GSYP had taken resort to religion to mobilise the people. The GSYP cut off all kinds of organisational links with the Nrusinghnath and Harishankar Surakshya Samiti and operated separately.[17]

On 19th August 1985, a public meeting was organised in the market place of Paikmal. At this historic gathering many important decisions were taken with the consensus of the public. The GSYP was reformed to make it a systematic and mass organisation. The youth of all the area were given representation. The youth of the organisation worked as the core group of the Andolan while others played supporting role and offered advice. Female representation was sizeable. Around 200 people from 15 villages took part in the meeting. At the end a demonstration was taken to the Police Station, Paikmal, raising anti-BALCO slogans and submitted a memorandum demanding the withdrawal of the project.[18] On 29th August 1985, in a meeting the GSYP decided the further course of action about the andolan. Public meetings and rallies were held frequently. After various representations to the Central and State governments no satisfactory response was received. At a meeting on 27th September, GSYP decided to take up agitational programmes against BALCO's construction work.[19] From 14th to 16 October, a three-day dharna programme was organised in front of BDO, Paikmal. On 14th October, representatives of 23 villages, on 15th, 56 representatives of 25 villages and on 16th 70 representatives of 40 villages participated in the dharna. By the end of dharna more than 1000 villagers, most of them tribals, took part in a procession.[20]

Serious pressure from different sources and the possibility of violent agitation compelled the Government to take note of the situation. On 26th August, the then Congress Chief Minister convened a meeting to discuss BALCO's environmental management plans and its problems. The meeting also discussed the recommendations of an expert team who visited the area on 18th June 1985 to study the possible adverse effects of the project. This was represented by all high level authorities including the local MLA. It was decided in the meeting that the BALCO would follow the environment management plan strictly, various conditions regarding the employment and afforestation measures should be entrusted. The meeting also decided that an Environment Management Committee would be constituted to periodically oversee the environmental management of this project and to monitor its implementation. The composition of the Committee was as follows:-

(1) R.D.C. (N.D.) .. Chairman

(2) M.L.A., Padampur and Patnagarh.

(3) Collectors, Sambalpur and Balangir.

(4) One representative from each of the following Departments:-

(a) Department of Science and Technology and Environment (Additional Secretary, DSTE)

(b) Forest Department (DFO Khariar and Balangir).

(5) One representative from the State Prevention and Control of Pollution Board (Secretary).

(6) Deputy General Manager, BALCO (Convenor)[21]

The meeting was followed by the setting up of a Committee under the chairmanship of Dr. M.K. Rout of the State Prevention and Control of Pollution Board. The committee appointed to have an assessment of the adverse impact of mining project. By this time the impact of road, railway and ropeway building, erection of a water supply reservoir in the name of Durgeijharan Minor Irrigation Project for BALCO township became quite apparent to the people. GSYP discussed issues like deforestation, micro-climatic variation, silting of streams, dust pollution, entry of frightened wild animals into villages due to blasting sound etc. Through frequent meetings and workshops and gathering of people, people's active participation through rallies, sloganeering, signature campaigning which resulted in direct actions like relay hunger strike, picketing on BALCO's road to prevent vehicles going to mining sites, boycotting labourers from BALCO's work at the cost of arrest and litigation etc. The people alongwith the activists of the Andolan sharply criticised the report of Dr. Rout Committee. According to the reaction of the people, the report came down in favour of BALCO project. It did not go into the

details of the damage done in terms of economy and environment. The report claimed that under no circumstances would the Nrusinghnath and Harishankar be affected, it proved vague about issue of Garud Pillar bursting out. The BALCO authorities after a long discussion and negotiation with the leaders of the satyagraha admitted that the irreparable losses caused due to the mining operation.

The agitation continued at regular intervals. By the first week of December 1985, various village level committees of GSYP had been formed in 20 villages. At Mithapali mostly attended by women,. satyagraha and agitation programme was declared on 13th December 1985. It was declared to stop all vehicles and the works of BALCO such as construction of building, road, railways, ropelines and cutting down of trees. On 25th December, 150 satyagrahis including 70 women and 20 children, participated in the dharna in front of BALCO office at Paikmal. On 26th December, 200 satyagrahis including 80 women with their children had joined. The police arrested 69 people including 15 women, 12 children, along with the leaders of the Andolan.[22]

In February 1986, a two-week long satyagraha took place from 4th to 19th February. Rasta Roko Satyagraha agitation was launched to stop BALCO's vehicles going

toward the hills for the construction work. At this stage, a large number of women joined the agitation during the satyagraha, scores of people were arrested. Adivasi women also went to jail. A total of 700 satyagrahis including 229 women and 63 children had joined the movement, 186 including 87 women were arrested, 74 of which 40 were women, were dragged to the Bargarh sub-jail 100 km from Paikmal, though the jail was meant for the 6 male and6 female prisoners. Now more than 60 villages around the hills joined the agitation although still not free from fear. Voluntary staffed legal cells were opened at Padampur and Sambalpur to help the agitators. Later on, the GSYP led a Padyatra carrying the message of "save Gandhamardan from Harishankar to Nrusinghanath", covering a distance of about 120 km in eight days. The padayatra was led by veteran Sarvodayal leader, Manmohan Sahoo. On an average of 40 to 200 people accompanied the Padyatra.[23] On the second week of February 1986, Chipko leader Sunderlal Bahuguna visited the Paikmal area on the invitation of GSYP. He addressed a number of meetings with the village people, discussed with the intellectuals in Sambalpur University and met press reporters at Sambalpur. This gave a further push to go ahead with sustained demonstration and protest. From this time on the andolan issue got an exposure in national and regional

media. Both local and national level Press reporters, voluntary action groups started visiting the area, prepared their reports. Peasants of the distance villages understood that mining for long time would cause drying out the streams, adversely affecting the agricultural practices which ensured their participation and the movement took on a larger dimensions.

The movement drew the support of the people from outside during the first few months of 1986, some intellectuals of Orissa residing in Delhi, organised the Gandhamardan Protection Committee, collected signatures of the leading intellectuals of Delhi and made an appeal to the Prime Minister to take necessary action.[24] Towards the month of May the GSYP took a stall on the occasion of Nrusinghanath Chaturdasi Mela in order to spread consciousness among the thousands participated from various localities of the region.[25]

On 30th May 1986, the then Secretary, Department of Mines, B.K. Rao and Chairman, Department of Mines, P,K.Rao visited Paikmal, met the leaders of the movement, they had suggested that an aluminium plant could be set up in the region provided the co-operation of the local people. But after a careful discussion and consideration among the people the suggestion was

discarded. The agitation continued as the people remained unconvinced by any arguments of BALCO and the Government officials.[26] Meanwhile, the Government of Orissa also deputed three expert committees to the area and collected their reports. Some action groups such as Peoples' Union for Democratic Rights and the Institute for the study of society and culture visited the area, based on their observations prepared reports and published. The views of the Department of Environment came up stating the Environmental Management Plan of BALCO was totally silent on the impact of the Mining operations on the flora and fauna, tribal population, monuments and the overall hydrological regime.. These were extremely urgent issues which had received no attention at all.[27] On this ground, on September 1986, the Department of Environment pointed out that bauxite needed for Korba plant of BALCO could be supplied from NALCO mines which were under development. Pleading for the abandonment of the project the DOE stated that the consequential loss in investment to the tune of Rs. 30 crores would, however, result in saving of direct ecological cost to the tune of Rs. 380.22 crores.

On 5th September 1986, the Deptt. of Mines set up a three-member committee, headed by Dr. B.D. Nagchoudhary to study "IN DEPTH" the impact of the proposed devellopment of Gandhamardah bauxite project

in Orissa on ecology and environment including inter alia on the waterfalls, streams, medicinal plants and herbs andhistorical shrines.[29] Further, by a subsequent modified notification dated 19th September 1986, the word "tribal" was inserted after the term "temples".[30] In the light of initial objections, the government had constituted this expert committee. As against the claims of GSYP that BALCO's initial mining activities have seen the destruction of 66,000 trees. BALCO maintains that it has so far felled only 3,223 trees and only 429 trees are required to be felled.[31] The officials quoting the Tribal and Harijan Research Institute study that only 16 villages having 4245 families with population of 6,238 persons would be affected due to the implementation of the project. Whereas it was a clear fact that nearly 50,000 tribals would be directly and indirectly affected due to the project. The GSYP also objected that after the considered opinion of the DOE, there was no need of appointing another committee. Thus, the appointment of Dr. Nagchoudhary Committee itself was clever move by the Deptt.of Mines to scuttle the report of DOE and to go ahead with the project. The report submitted by the committee remained a closely-guarded secret for only selective recommendation of the proposed bauxite crusher plant at the mining site in a bid to minimise the dust and vibration on the hills. The centre

continued to perceive the problem as political and Minister of Mines, Mr. M.L. Fotedar's optimism was not shared by the people in the field. Given the track record of the State Govt. in rehabilitation of people displaced due to the Hirakud and Rengali Dams, the resistance to BALCO's Gandhamardan project is understandable.

On 9th April 1987, a general body meeting of Parishad was held at Nrusinghanath around 500 people including 150 women from Balangir, Sambalpur, Kalahandi and Chhatisgarh area took part in the meeting. The activists and the leaders from villages and various branches of GSYP addressed the gatherings, decided to defeat the BALCO and drive out from the region at any cost.[32] During this time, physical assault on the activists was committed and threatening at number of occasions by the local Congress leaders and the employed miscreants. The anti-BALCO Andolan, according to the opinion of the activists appeared as anti-Congress to the local Congress leaders. Many deliberate attempts were made to demoralise the activists. The police was directed against the GSYP. Thus, inspite of Environment Deptt rejection of mining project, the BALCO's construction activities went on. At the same time, leaders had to sustain the mood of the andolan by any means. Untill the final decision about the

withdrawal of the project was not declared by the Govt. there had been regular meetings, gatherings at various places, organising common kitchen, where the people of all sections irrespective of caste, creed and religion, were taking food together. The sarpanchs of various panchayats were given the responsibilies for organising public meetings and collection of funds. The cultural wing of the GSYP used to stage the play "Gandhagiri" at various villages and attracted people in a massive scale. The drama depicted the BALCO project as the "BALCO Rakshyas" directed against the project. Side by side the activists took up anti-liquor programmes, which was most harmful for the illiterate rural people of the region. On 19th May, as part of the peoples; awareness generation programmes a cultural programme was organised at the bordering villages of Kalahandi and Sambalpur. The tribal women of the village, Miss Ambika, Rukmani, Tesi, Tamaki installed a waterfull of Kalash at the entry point of the village and in the name of Goddess Durga, Durgei gate was established against the entrance of BALCO officials and vehicles. Gyanananda Saraswati, an Arya Samaj saint, who also played the role of an advisor in GSYP during the movement, recited vedmantras on the occasion. Thetribal leader, Gangaram Majhi took the leadership of the function.[33] During the first week of June a mass

rally demonstration was staged at Paikmal. 3000 people including half of them women, submitted an 11-point demands to BDO, Paikmal, calling upon the BALCO to quit the region immediately. The meeting was addressed by the Organising Secretary, Miss Pankajini Rout and convenor, Niranjan Vidrohi etc. Afforestation programme began from the month of July in order to fill the damage done by BALCO. The tribal leader Ghasiram Mullick took the initiative.[34]

Although the local Congress leaders initially took the side of the project, ,later they appeared sympathetic to the peoples' demands. The officials including the BDO, collectors ad the State govts' stand at best was only ambivalent, the issue drew its attention toward election. During the whole year of 1988 and 1989, thus, the issue became important in elections. The Janata Party made an issue out of it, by making promises in election manifesto that if the party came to power it would put the lid on the BALCO project. The Congress Party also took the side of the people by promising to withdraw support from the project. The people did not allow the entry of BALCO's machines and construction materials etc. The activities at the hill top was already stopped before that and by the year 1988 all the activities came to a complete halt.[35]

On 12th April 1989, a tripartite meeting was called by the Chief Minister of Congress(I), including BALCO authority, local Congress(I) MLA and MP, the Andolan activists of the GSYP including 11 tribal and Harijan women delegations. The Chief Minister emphasised upon the report of Dr. Nagchoudhary Committee that certain conditions put forward by the committee such as the mining be allowed if the BALCO take care of conflict of interests by strictly following the Environmental Management Plans. The BALCO authority accepted the proposals. But the people did not agree with the proposal and demanded for the withdrawal of the project. The local Congress MLA and MP took the side of the people. The CM ultimately declared that due to the peoples' disagreement to the proposal the project would no longer continue in the region. Subsequently, the Chief Minister advised the Minister of Steel and Mines, Govt. of India in Jun 1989 to shift the project outside Orissa. On the basis of the statement of CM about the withdrawal of the project, one section of the activists under the leadership of Mr. Bhabani Hota and Prasanna Sahoo celebrated the "victory" of the people. But another section of the activists pointed out that unless and until there was a systematic official announcement regarding the withdrawal of the project, it seemed to be merely an election promise. With this difference of

their opinion the GSYP divided into two separate organisations during the early part of 1989.

The Janata Party came to power in the State during the Assembly Election on December 1989. After the party came to power the Chief Minister announced that the lease would be granted to BALCO once again. Since the drought prone area of Padampur and Paikmal are backward regions and having lack of job opportunities due to the absence of any modern industry, the Govt. decided to set up an aluminium industry in the western part of Orissa in order to provide employment opportunities to the local people. The local Janata Party MLAs were employed to generate opinion in support of the proposal, but they were in vain due to the peoples' strong opposition. Soon after the Govt. decision, the people began to organise meeting. On 1st January 1990 the GSYP held its annual session, discussed about the BALCO and the future status of the hills. The decision of the CM had upset the Janata Dal MPs from the western part of the State.All these MPs such as the Sambalpur MP, Mr. Bhabani Hota was a known opponent of the project worked as the spokesman of the GSYP, Balangir MP, Balgopal Mishra and Kalahandi MP and the then Deputy Minister Bhakta Das reaped political advantage by associating themselves with the movement mainly on ecological grounds.

The CM informed the Steel and Mines Minister, Mr. Dinesh Goswamy that the project could be revived after shifting the location from Sambalpur district to a place 30 km beyond the Gandhamardan Hills. Mr. Goswami had sought Mr. Hota's cooperation in reviving the project. But the MP had reiterated that he was thoroughly opposed to the project on various grounds such as economic, cultural and for irrigation problems.[36] At last in March 1991, the GSYP led a cycle rally to Bhubaneswar, demanding the withdrawal of the project. The delegation met the CM for holding discussion with regards to the decisions made by the Govt. After a long hour negotiation and discussion, the CM withdrew his decision about the revival of the project. But there was no further re-notification about the announced proposal in the official gazette or in any newspapers regarding the withdrawal of the project. The people are still doubtful about the project. They feel that the Govt. mayat any time give out the lease for mining.

Notes:

1 Chiroli and BALCO (Article by Prasanna Sahu, Prajatantra, 9th Sept. 1990

2 Ibid.

3 Chirolid and BALCO (Article by Prasanna Sahu, Prajatantra, 9th Sept. 1990.

4 Mining and Geology Notification dated 10th Sept. 1981.

5 Uptodate Information Sheet on BALCO's Gandhamardan Bauxite Project, Paikmal (Sambalpur) dated 7th Aug. 1986.

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CHAPTER IV

MINING IN INDIA : MINERAL POLICY AND ENVIRONMENTAL ISSUES IN THE CONTEXT OF BALCOS' BAUXITE MINING IN THE GANDHAMARDAN HILL

Mining is second only to agriculture as the worlds' oldest and most important industry. There is no doubt that mining is a vital sector of the economy in any country. Mineral commodities play an important role in national economic development. While no particular type of resource is essential to economic well being, the existence of rich mineral reserves can provide a basis for accelerating overall economic development. The minerals which are extracted from the earth's crust serve as the basic raw materials for various industries. As the demand for raw-materials keeps on growing, to meet this growing demand the size of mining operations has increased.

Most of the Mineral industry in India occur in the backward region. Therefore, the focus has been on regional development primarily through employment generation, creation of infrastructure, revenue and profits, foreign exchange etc. These are considered to be the social programmes of the State specially designed to meet development goals. However, it cannot be denied that there are some negative aspect to this

development, such as its effect on the environment, social-cultural effects and even negative economic impacts. Pollution in the form of gases, and chemicals, as well as physical damage to an area caused by mining and the lack of reclamation of the mined out area are well known. The development of mining can also create a small class of highly paid employees, while other people in the region remain relatively poor, leading to resentment and conflict, or in other words negative social-cultural impacts. Therefore, the contradictory tendencies between the support of production systems for a larger economy and the demand for regional development have led to an unhealthy relationship between income generation and reinvestment for development. Technological change has often meant both regional unemployment as well as the import of skilled labour from outside the region because of the socio-economic underdevelopment of the local people. Mining has led to the destruction of the mineral resources as also of other productive natural resources such as land, water and vegetation.

The mining of mineral resources whether by open cast or underground methods has adverse environmental impacts. The magnitude and significance of these impacts however, varies in the case of different minerals depending upon the method of mining and

beneficiation (i.e. treatment of ores prior to refining, usually done by washing, screening etc. to remove sand and clay), scale and concentration of mining activity in conjunction with the geological and geomorphological setting of the area, the nature of the mineral deposits, the land use pattern before the commencement of the mining operations, the natural resource existing in the area, etc.[1].

In the context of India today, the environmental consequences of mining are apparent in a number of cases. A case study of mining around Udaipur city reveals that there are numerous mines, mining various minerals. Due to mining activity, an imbalance has occurred in the ecosystem of the region. At present Udaipur and its environment have about 100 mining leases of these 73 leases belong to Udaipur mineral basin. The mining operational area covers 150 lakhs Sq. metres with overburden spoiling about another 15 sq. metres area. On occasion, the overburden becomes unstable, resulting in the loss of crops as farms are covered with colluvium. Human deforestation activity has increased very rapidly and all the hills are now devoid of vegetation, inviting accelerated soil erosion which increases siltation in nearby lakes and tanks. Historically, this area was very rich in wild life. For example, two decades ago it had tigers, lions,

deer, hares, foxes, wild pigs and wild cats but today it does not even have vegetation[2].

From his analysis Lodha argues that the industries are poorly located and the consideration of locating industries has been regarded from the least cost point of view environmental concerns are considered to be unimportant. Money spent on the improvement of environment is considered a loss of profit. The gain is being gathered by an individual which the loss is being poured on the public in the form of a deterioration of its quality of life[3].

The mining industry in Australia and its impact on aboriginals beats some resemblance to the Indian situation and can be cited here. The study reveals that through mining, Aboriginals have gained new community facilities, improved transport and communication, access to better health and medical facilities, some employment and training opportunities and royalties. Modern technology has assisted movements to out of station, facilitated hunting and fishing and preservation of ceremonies, offsetting to some extent the adverse effects of mining on traditional culture. As with the cost of mining however, these benefits are not equally distributed among Aboriginal groups[4].

On the other hand, mining operations have often resulted in the destruction of sacred sites, alteration of the landscape, environmental pollution and reduction in the population of native animals and birds. The effect on the private life privacy of Aboriginal people has occurred and problems of alcoholism have been exacerbated. The developments have generally placed Aboriginal communities under stress. None the less, their direct involvement in the new mining towns has generally been minimal and they have been relegated to a fringe-dweller status. The difficult adjustment process faced by Aboriginals has frequently been associated with a decline in traditional authority patterns and adverse effects on moral and community discipline[5].

In the name of nationalism, legislation is being used to destroy the environment and tribal people of the gentle upper valley of Damodar. Irreplaceable world heritage and palaeoarchaeological sites are threatened. Wildlife in all its forms is also threatened[6]. Mining operations generally cause displacement of the local people and the immigration of a new set of people is a certainty. In the case of the Piparwar project this problem is apparent with the migration of a new set of people who bring in new values and the worst aspects of their cultures.

Criminal values come in, of which living examples may be seen in the industrial belts of eastern India e.g. Dhanbad, Ranchi, Jamshedpur, Rourkela. A society develops which lives off the local people by loosening their control over natural resources. The local people are marginalized in the process[7]. Environment consists not only of natural resources but also includes men and women and the relationship between different strata of society. Inter-sectoral linkages, contradiction between maximisation of production, minimization of waste and welfare of the deprived and the long term impact on nature as well as its effect on society should provide the background for analyzing the question of the environmental impacts of mining at the policy making level. Mineral development in any country, whether developed or developing, constitutes only one element of total national development and must therefore be structured to fit into the total economic development plan[8].

The broad objectives of mineral development can be categorized as follows: to ensure optimal use of available mineral resources; to earn or save foreign exchange; to create employment (direct or indirect), often in remote or depressed areas; to promote backward and forward linkages (service and supply industries and processing of raw material) in order to maximize value

added within the country, to the extent that it is economically sound; to ensure an adequate supply of raw material inputs for industry; and to stimulate regional development often in remote areas.[9] In the majority of developing countries no such policy has been formulated; decisions are made on an ad-hoc basis and development of the Mineral Sector is often sporadic and ill-directed, at times even forfeited by the absence of a clearly defined policy.[10] In the case of India, the growing protest and discontent of the public over issues of emerging environmental degradation, on the one hand, and the losing of their means of subsistence due to the very process of development on the other, have emerged as an imperative, altering policy planners to the problems of a sustainable development that is ecologically, socially and economically sound and viable. However, such has not been the trend of the process of planned development thus far. The strategy so far adopted by the policy planners in this direction merely repeats on the growth model of the economy, to carry out development and social welfare goals. But when it comes to the question of achievement and fulfillment of these desired objectives and goals it has failed. Even at the most mundane level it has led to the inescapable conclusion that the above considerations have been neglected in the development

project of the Indian state ignoring the larger interests of society. To put it precisely, the programmes of mineral exploitation and development of resources are linked with the important developmental issues relating to the problem of an under-developed economy such as India. Therefore, any policy that deals with mineral industry/mineral resources development must be located in the larger context of a policy on development because it is only one part of a composite policy having broader implications in terms of environmental consequences and impacts on the socio-economic life of the people of the region.

In this chapter, an attempt has been made to focus primary emphasis upon evolutionary trends in the mineral policy and environmental consequences so as to locate it in the context of the BALCO project proposal. To elaborate more substantially the importance of various considerations in terms of the impacts on ecology, environment peoples' lives socio-economic impact the case of Bauxite mining in the Gandha Mardan hills has been dealt with. The past decades have seen a trend toward massive mining operations which take advantage of the economies associated with large production capacity and the use of modern technology. Although the most important breakthroughs occurred in the recent past we will also focus here on the

developments in the pre-independence era. This will also include a specific emphasis on Bauxite mining and legislative measures.

Emergence of Mineral Policy : Problems and Prospects

The mining industry is a major development sector in India. Ever since the earliest civilization the dependence of primitive societies upon mined products is illustrated by the nomenclature of these epochs such as Stone Age, Bronze Age, Iron and now Atomic Age, a sequence showing the increasing complexity of society's relationship with mining.[11] The history of mining in India has been the history of civilization. Zawar, Khetri, Dhariba in Rajasthan, various coal and iron ore mines in Bihar and Madhya Pradesh vividly display the mining activities of ancient times.[12]

Mining of minerals in the Himalayan region prior to independence is a case in point. A well-documented case record is available for iron ore mining and smelting in Kumaun undertaken in the last century.[13]

Prior to independence there was no definite policy for the development and utilization of minerals. Despiting the setting up of the Geological Survey of India (GSI) in 1851, exploratory activity was in a low key as demand was limited. The minerals were worked in an unscientific manner, interest had been shown only in

the high grade easily accessible and mineable minerals for foreign industries without any consideration for the conservation or proper utilization of the mineral wealth of the country. Gadgil and Guha, for instance, have shown the European countries' monopoly over the natural resources during the colonial period. In what they call the industrial "mode of resource use", they have examined how, over the last three centuries industrial societies have steadily expanded their resource base. The expansion of the resource base in industrial societies has rested upon access to land and natural resources which were earlier controlled by gatherer and peasant societies. Reeling under an energy and exhaustion of their forests, European colonists laid claim to vast terrains the world over.[14]

Where the ecological setting did not permit such a take-over, as in the older civilizations of the Middle East and Asia, or in the humid tropical forests of the Amazon, the Congo and Malaysia, these Europeans nevertheless established a firm hold on the resources of these regions and organized outflows of those which they most desired to their own lands and people. Thus India became an exporter of teak, cotton, jute, tea and various precious metals and minerals like iron, coal, copper, etc. to her colonial master.[15]

Indian Independence was a water mark in the national outlook on mineral development. A Mineral Policy Conference was held at the beginning of 1947. The conference unanimously agreed upon the advisability of formulating a well-coordinated national mineral policy to ensure the planned development of the mineral resources of the country and to establish a complete technical organisation to maintain close liaison among the various Ministries and departments of the Government of India, as well as to advise them on all matters concerning minerals. The Indian Bureau of Mines came up in 1948 primarily to advise Government on mineral policy matters.[16]

There was a further push in this direction when the Planning Commission was created by a resolution of the Government of India in 1951. The guidelines were codified for the first time in the Industrial Policy Resolution of 1956.[17] It conceptualized and articulated the basic framework for the planning process while defining the operational areas for the public and private sector enterprises.

The foundation of Indian Geological Knowledge by the great pioneers, and massive exploratory activities conducted since the mid-fifties by national agencies like the Geological Survey of India. Prospecting Wing

of the Indian Bureau of Mines, the Oil and Natural Gas Commission and other central and state agencies, helped not only to build up a sound base for the Indian mineral industry, but also to produce a clear picture of the identified and prospective mineral resources. These efforts resulted in a significant increase in the resource inventory and in the production of major minerals.[18] The exploratory capacity has expanded tremendously during the last four decades.

The Department of Mines in the Ministry of Steel and Mines is responsible for administering and coordinating this complex task, from the initial stages of survey and assessment of existing reserves, regulating development and exploitation and the production and distribution of non-ferrous metals in the public and private sectors. The Department of Mines controls and regulates the development and exploitation of all minerals other than natural gas, petroleum and atomic minerals. The mining and recovery of non-ferrous metals such as aluminium, copper, gold, zinc and lead etc. are administered in accordance with the Mines and Mineral (Regulation and Development) Act, 1957.

The Geological Survey of India, which is the largest scientific organisation in this country, and the third oldest organisation of its kind in the world,

carries out geological investigations and geo-scientific studies which have a bearing on other important sectors of our economy.

A third organisation, the Indian Bureau of Mines is a multi-disciplinary scientific and technical organisation primarily responsible for the conservation and scientific development of mineral resources. The IBM advises the Central and the State Governments on all aspects of the mineral industry, trade and legislation.

In the developmental activities, funding support has been provided by the Government of India under various plans prepared by the Planning Commission.

Plan outlays (Rs. in crores)

	Plans				
Sectors	III	IV	V	VI	VII
Coal/lignite	220	510	1140	2870	7400.58
Non-ferrous	42	NA	NA	1380	2050.00
Steel and ferrous minerals	31	420	1959	4000	4420.30
Total	293	930	3099	8250	15870.88
Total plan outlays	7500	24882	53411	156000	320000.00
Mineral Sectors % of total	3.9	3.7	5.7	5.3	4.9

Source: Five-Year Plan Documents, 1961, 1969, 1974 1978, 1980, Planning Commission, Govt. of India

The Indian mining industry made spectacular progress not only in terms of growth but also in size, output and in scientific and modern technological applications. This progress has been reflected in the fact that the value of mineral production since 1947 until 1989 has multiplied about 150 times and the overall increase in the quantum of mineral production has been about tenfold. The total value of mineral production, excluding atomic and minor minerals for the year 1990-91, was Rs. 17,690.7 crores (see Table No. 1). On individual minerals, the following growth is perceived during the period 1947-1985 (indicated in Table No.2 and 3).

Table 1: Decennial Growth in the Value of Mineral Production 1950 to 1990-91 (By groups/Rs.Cores/ Excluding atomic minerals)

Year	Total Value	Fuel	Metallic Minerals	Non-Metallic C-Minerals
1950	70.1	48.5	13.8	7.8
1960	166.0	112.5	32.6	20.9
1970	489.3	348.7	61.9	78.7
1980	2310.9	1714.6	251.6	344.7
*1990-91	17690.7	15130.3	1198.8	1361.6

(* Provisional)

Source : Indian Mineral Industry at a glance 1990-91, Govt of India, Indian Bureau of Mines Nagpur - October 1992.

Table 2: Growth of Mineral Production in India

Year	Total Value
1947	64
1951	85
1961	176
1971	503
1975	1112
1976	1364
1977	1479
1978	1583
1979	1922
1980	2305
1981	3736
1982	5336
1983	6797
1984	7680
1985	9600
1986	9816

Source: Mineral Development in India : A panorama of last four decades. IBM Ministry of Mines and Steels Dec. 1990 Indian Mineral Year Books 1960, 1985.

Table:3 Growth of Mineral Production (In million tns)

Year	Bauxite	Chromite	Dolomite	Gypsum	Iron Ore	Coal
1951	0.07	0.02	0.01	0.21	3.27	35.0
1965	0.71	0.06	0.98	1.16	23.87	67.16
1975	1.3	0.5	1.47	0.82	41.8	95.9
1976	1.4	0.4	1.89	0.73	43.7	100.8
1977	1.5	0.35	2.19	0.78	42.6	100.3
1978	1.7	0.27	2.00	0.89	39.3	101.3
1979	1.9	0.31	2.18	0.88	39.8	103.3
1980	1.8	0.32	2.03	0.87	41.6	109.2
1981	1.6	0.34	2.07	0.95	41.6	123.1
1982	2.0	0.36	2.2	0.96	42.7	128.5
1983	1.9	0.46	2.24	1.02	38.1	136.3
1984	2.1	0.45	2.33	1.25	41.9	144.5
1985	2.01	0.54	2.28	1.21	43.1	147.0

Source: Indian Mineral Year Books 1960, 1980 and 1985

The above achievements have been made possible primarily on account of the role played by the Government of India through its various agencies.

As of 1990-91, the country has a total of 4,163 working Mines of which 522 in coal and lignite, 2927 in non-metallic sector and 714 in Metallic sector mining. Except in coal and lignite, the number of working mines have declined since 1987 (See Table 4) However, it

cannot be denied that environmental protection measures became an imperative for the policy planners.

Table 4: Number of Working Mines (By groups) (Excluding, Petrolium, Natural Gas, Atomic and Minor Minerals)

Years	Total	Coal/Lignite	Metallic	Non-Mettalic
1981	3926	462	730	2734
1982	4109	478	721	2910
1983	4183	485	734	2964
1984	4205	493	725	2987
1985	4305	503	733	3069
1986	4425	501	776	3148
1987	4716	518	853	3345
1988-89	4502	506	784	3212
1989-90	4362	509	742	3111
1990-91	4163	522	714	2927

Source Indian Mineral Industry at a glance 1990-91, Govt of India, Indian Bureau of Mines, Nagpur, October 1992

Of the non-ferrons metal such as copper, lead, zinc and Aluminium, it is only with regard to Aluminium that India is comfortably placed as far as the mineral endowment is concerned. This is the primary reason for our having a production programme which is heavly tilted towards this metal.

Table 5: Compound Annual Growth rates in Production from 6th to 7th Plan

Commodities	Production 1984 to 85	Annual Growth rate from % 1989-90	Production Target
Coal Mt.	147.44	8.9	226.00
Lignite Mt.	7.8	14.9	15.2
Iron Ore Mt.	42.2	6.6	58.1
Saleable Steel Mt.	8.77	7.6	12.6
Alumina'000t	276.5	12.5	499.00
Refined Copper 000t	33.5	5.0	42.7
Zinc 000t	57.6	9.1	89.00
Lead 000t.	14.2	13.7	27.00

Table 6: Target Performance

Plan	Coal Mt.	Alumina 000t.	Refined copper 000t	Zinc 000t	Lead 000t
6th Plan Target 1984-85					
Dem.	155.70	450	115	150	60
Cap.	-	350	47.5	98	30
Prod.	152	300	45	85	25
Performance					
Dem.	139.22	310	109	130	60
Cap.	-	362	39.4	96	30
Prod.	147.44	276.5	33.5	57.6	14.2
7th Plan					
Dem.	237	450	141	163	90
Cap.	-	580	47.5	96	30
Prod.	226	499	42.7	89	27

Today, India has achieved self-sufficiency in various minerals and metals. The domestic requirement of the country is largely met by internal supplies, except for a small quantity of some minerals imported to meet specific requirements. In the case of ferro-alloys also, the country has achieved self-sufficiency. However for the base metals such as copper, zinc and lead, the country depends on import. Table 7 below shows the domestic demand and supply of minerals and metals according to 1986 figures.

Table 7: Demand Supply ('000tns)

Mineral Commodity (1)	Domestic Consumption (2)	Domestic Supply (3)	Order of Self-sufficiency (4)
Minerals			
Asbestos	76	2.2	3
Barytes	111	337	100
Bauxite	1976	2662	100
Bentonite	83	105	100
Borax	8.6	-	-
Chromite	316	630	100
Cryolite	5.6	3.8	68
Dolomite	1914	2208	100
Fireclay	550	705	100
Felspar	62	48	78
Fluorspar	35	19	53

contd...

(1)	(2)	(3)	(4)
Fullers'earth	84.5	84.5	100
Gypsum	2264	3154	100
Iron Ore	17057	51610	100
Ilmenite	47	148	100
Kyanite	30	32.4	100
Limestone and Calcareous minerals	55560	61386	100
Magnesite	295	460	100
Manganese Ore	1009	1284	100
Rock phosphate (including apatite)	1788	667	38
Rutile	3.4	8	100
Sillimanite	10	15	100
Silica Minerals	1162	1507	100
Sulphur	905	77	8.5
Talc/stealite/ pyrophylite	425	437	100
Metals			
Aluminium	315	257	82
Copper (Cathode)	84	36	43
Lead (Primary & Secondary)	64	27	42
Zinc	126	74	59
Ferro-alloys			
Ferro Chrome	9	43	100
Ferro Manganese	133	179	100
Ferro Solicon	26	62	100

Source: Mineral Development in India. A Panorama of last four decades IBM-Dec.1990-Nagpur

Emergence of the public sector in the development of the mining industry:-

The Government of India set out in a resolution dated 6th April 1948, the policy which it was proposed to pursue in the Industrial field. The resolution emphasized the importance to the economy of securing a continuous increase in production and its equitable distributions. It also pointed out that the State must play a progressively active role in the development of Industries. It laid down that besides arms and amunition, atomic energy and railway trasport, which would be the monopoly of the Central Government, the State would be exclusively responsible for the establishment of new undertakings in six basic industries - except where, in the national interest, the State itself found it necessary to secure the co-operation of private enterprises. The rest of the industrial field was left open to private enterprize though it was made clear that the State would also progressively participate in this field[19]. A striking feature of this policy was that, at the time of India's independence, the mining industry was dominated by the private sector and continued to dominate it till 1956 when the new industrial policy resolution was enunciated.

The new Constitution of independent India enunciated Fundamental Rights and Directive Principles of State Policy. Planning was inaugurated and the first five year plan was ready although not very systematic. Parliament had accepted the socialist pattern of society as the objectives of socio-economic policy. These developments necessitated a fresh statement of Industrial Policy[20], more particularly as the second five year plan placed it. The policy was therefore governed by the principles laid down in the constitution, the objectives of socialism and the experiences of the early years.

In order to realize these objectives it was essential to accelerate the rate of economic growth and to speed up industrialization and in particular to develop heavy industries and machine-making industries to expand the public sector and to build up a large and growing co-operative sector. The aim was to provide the economic foundations for increasing opportunities for gainful employment and improving living standards and working conditions for the mass of the people. Equally, it was urgent to reduce the existing disparities in income and wealth to prevent private monopolies and the concentration of economic power in the hands of a few[21].

Accordingly it was imperative for the State to assume a predominant role and direct responsibility for setting up new industrial undertakings for developing transport facilities, etc. On this basis the resolution classified the industries afresh and laid down three categories which had a close resemblance to the earlier classification, but were more sharply defined and were broader in coverage regarding the role of the State.

A. Schedule A : Those which were to be the exclusive responsibility of the State;

B. Schedule B: Those which were to be progressivley State-owned and in which the State would generally set up new enterprises, but in which private enterprise would be expected only to supplement the efforts of the State; and

C. Schedule C: All the remaining industries and their future development would, in general, be left to the initiative and enterprise of the private sector[22].

With the adoption of the Industrial Policy resolution of 1956, the Government undertook the responisbility for developing capital intensive mines

for key minerals like coal, iron ore, copper ore, bauxite, lead, zinc ore, dolomite, manganese for basic industries as well as for export. Several State Governments had also taken up exploration and exploitation of mineral deposits on a commercial scale. Public sector enterprise such as the Steel Authority of India Ltd., Hindustan Copper Ltd., Hindustan Zinc Ltd., Bara Gold Mines Ltd. and a number of others came up to channelize support and supplement efforts for providing minerals required in ever increasing quantities. Exploration activities at the Geological Survey of India, through a new set up named Mineral Exploration Corporation and Organization such as IBM played a useful role in the scientific development of mines and the conservation of minerals. As a result of these efforts, the role of the public sector has steadily increased in the mineral industry over the last four decades. By the year 1989-90, Public Sector operations have contributed as much as Rs. 15784.7 cores which is about more than 90% of the total value of mineral production. The contribution of the public and private sectors in the value of mineral production is indicated in (Table 8)

Table 8: (Excluding Atomic Minerals)

Years	Total	Public	Private
1981	3739.4	3106.3	633.1
1982	5320.8	4743.7	577.1
1983	6778.1	6165.7	612.4
1984	8089.5	7345.9	743.6
1985	9094.1	8199.7	894.4
1986	10159.2	9183.0	976.2
1987	12221.8	11202.4	1019.4
1988-89	14667.8	13537.1	1130.7
1989-90	17335.8	15784.7	1551.1
1990-91	17690.7	16120.8	1569.9

Source Indian Mineral Industry at a glance 1990-91 - Govt. of India, IBM Nagpur - October 1992.

India in the recent (1980s) has set for itself certain production targets in respect of important minerals including coal, lignite and various other commodities and products till the turn of the century. However, achieving these targets will prove a stupendous task for the planners, though in some cases the machinery has already been geared up. The life indices of a number of minerals have already been worked out by the Planning Commission on the basis of the envisaged mineral production and recoverable mineral resources available.

Although Mineral sector development in the Indian economy is one of the vital sectors having wider implications in terms of environmnetal impact and effect on the socio-economic life of the people, it is noticeable that there is no clear policy perspective till the Sixth Five Year Plan. Though a large number of mines and beneficiation plants were commissioned in different parts of the country over the last decades, it was only during the 70s' that planners and mine executives first focussed their attention on the problems of deterioration of environment due to mining.

Concern for the natural environment and non-renewable resources, was triggered off only in recent times by the backlash effect of accelerated industrial growth. Maximum exploitation of natural resources was, until recently considered a desirable objective and the attendant pollution of air, water and land was accepted as unavoidable. It has now been recognized that the preservation of the environment and ecology is an equally important concommitant of the other development efforts for better living standards, and therefore the planned exploitation of natural resources has to be such that mining and environment can continue together in harmony[23].

Thus the protection of the environment has for the first time, been incorporated as a major objective in the draft national mineral policy of 1985 for the first time.

The Draft National Mineral Policy of 1985 in respect of all minerals other than coal, lignite and petroleum was prepared with the object of calling for the adequate supply of minerals; the optimal use of available mineral resources; the promotion of necessary backward and forward linkages; encouragement of Research and Development (R&D); minimising of the adverse effect of mineral development on the environment by taking appropriate measures; the development of infrastructure and the promotion of regional development[24]. A national mineral policy as comprehensive as this, would undoubtedly have a far-reaching effect on mineral development, mining and conservation activities.

The Five Year Plans generally set national goals and priorities. In the Fourth Five Year Plan, there was only a perfunctory reference to the environment and the 5th Five Year Plan said nothing about it. The 6th Five Year Plan for the first time made a mention of the environment in the plan document. The 6th Plan saw the environmental issue as a "Developmental issue" and the

planning process has continued to do so since. The 6th Plan sets out the approach - 'Environmental problems in Indian can be classified into two broad categories: "first those arising from the conditions of poverty and under development and second, those arising as negative effects of the very process of development". (Sixth Plan 1980-85). The Plan proposed to "adopt an integrated approach and implement methods of redressing existing environmental problems and build up the capacity of preventing or mitigating those that could arise inthe future. (Sixth plan 1989-85 p.349).

The Seventh Five Year Plan (1985-90) is even more general in its policy statement of goals to be achieved. "Given the close linkages between different subject areas and often counter-productive to assign absolute priorities in the sense of an "order of importance" to these areas. For a variety of basic economic activities high priority would have to be given to the management of natural living resources, but these cannot be managed without attention to land and water management. The direct goals relating to the subject of environment as a whole are to be: institutionalising the process of integrating environmental management and development; including organizations at central, state and local levels to incorporate environmental safeguards in their plans and

programmes; securing greater public participation in environmental management; establishing a strong S&T base for environmental research and development, demonstration and extension activities; strong thinking mechanisms for ensuring concrete action with regard to environmental degradation that has already taken place. (p.388)

The Eighth Plan simply states; "An important task before the Government is the formulation of a comprehensive national policy on nature and natural resources .... The policy must spelt out the position regarding the environmental needs of the society in general and the rights of the weaker sections in industry. Integrated action could be needed for the prevention and control of pollution hazards, suitable location of industrial units, recycling of industrial wastes and adoption of energy efficient technology. (p.94).

Needless to say, during the past decades the demand as well as the production of the minerals grew with the accelerated pace and the future projections are in no way inferior. With the growth of mineral production grew the problems of environmental concern because the mineral processing activities disturb to some extent the existing eco-system.[25] The open cast mining for instance involves exposing the mineral bed

lying below the vegetation, soil cover and over laying rock mass. The mining thus begins with disturbing the eco-system of the area. The waste material is to be disposed off somewhere in the vicinity of the mine, may bury the vegetation or may slide into natural drainage channels or springs. The hill topography is also changed and the slopes resulting due to mining may be unstable. The mined-out area looks barren in contrast to the surrounding lush green vegetation. Sometimes the process of afforestation for mining gets mixed up with normal tree falling operations which may be legal or illegal. The overburden and the low grade mineral material slides down the slopes and the streams get clogged. The natural flow of water is hindered. The reduction in the flow of water affects the local populations which depend upon it. Less water flow ultimately reduces the quantum of water in the rivers. The flow increases the silt load of the streams which causes floods. And adversely affect the entire land mass and the water regime in the vicinity of the mines.

The National Mineral Policy has evolved over the years according to the changes that have taken place. During the earlier period, the policy primarily focussed its attention on optimal use of mineral resources. Even though considerations of regional development and infrastructural facilities, protection

of environment etc. were considered desirable objectives. Therefore, in the latest mineral policy of 1993 (for non-fuel and non-atomic minerals), certain new dimmensions have been injected in order to meet the growing need of the hour.

It is emphasized in the Draft National Mineral Policy of 1993 that minerals are valuable natural resources. Being finite, the management of non-renewable mineral resources has to be closely integrated with the overall strategy of development, and the exploitation of minerals is to be guided by the long term national goals and perspectives (pg I, M.P.).

In this context, the need has been felt to spell out in a statement the difference the policy, which has evolved over the years, relating to development of mineral resources and in regard to areas of concern which have emerged in recent years. The policy therefore emphasizes certain new aspects and elements like mineral exploration in the sea-bed, development of proper inventory, proper linkage between exploitation of minerals and development of small deposits in scheduled areas, protection of forests, environment and ecology from the adverse effects of mining, enforcement of mining plan for adoption of proper mining methods

and optimum utilization of minerals, export of minerals in value added form and recycling of metallic scrap and mineral waste. (pg. 1-2).

Mineral deposits generally occur in remote and backward areas with poor infrastructural facilities which often inhibit their optimum development. Mineral bearing areas are also often inhabited by tribal populations and the exploitation of mineral resources has not always contributed positively to their economic development. The contribution of mineral development to overall regional development has also not always been commensurate with the huge investment in large mining projects. A major thrust is needed for the development of infrastructural facilities in mineral bearing areas following an integrated approach for mineral development, regional development and also for the social and economic upliftment of the local including tribal population.(pg.9).

The extraction and development of minerals are closely interlinked with other natural resources like land, water, air and forests. The areas in which minerals occur often have other resources presenting a choice of utilisation among the resources. Some such areas are ecologically fragile and some are ecologically rich. Thus it is necessary to take a comprehensive view to facilitate the choice or order of

land use keeping in view the needs of development as well as the needs of protecting the forests, environment and ecology. Both aspects have to be properly co-ordinated to facilitate and ensure a sustainable development of mineral resources in harmony with environment (pg.10 Min.Policy 1993).

Mining activity often leads to environmental problems like land degradation particularly in opencast mining, land subsidence in underground mining, deforestation, atmospheric pollution, pollution of rivers and streams, disposal of solid wastes, etc. affecting the ecological balance of the area. Open-cast mining in the areas with actual forest cover leads to deforestation. Prevention and mitigation of adverse environmental effects due to mining and processing of minerals and repairing and revegetation of the affected forest area and land covered by trees in accordance with the prescribed norms and established forestry practices shall form integral part of mine development strategy in every instance (Mineral Policy 1993 p.).

Mining operations should not ordinarily be taken up in identified ecologically fragile and biologically rich areas. Strip mining in forests areas should as far as possible be avoided and it should be permitted only

when accompanied with comprehensive time-bound reclamation programme. No mining lease would be granted to any party, private or public, without a proper mining plan including the environmental management plan approved and enforced by statutory authority (Min.Policy 1993 - Pg.11).

The strategy for development of any mineral as the policy states should naturally keep in view its ultimate end uses. The guiding principle in the strategy of development of any mineral at any location shall ordinarily be the economic cost. The State may, however, undertake the development of any mineral or mineral deposit in public interest to ensure unhindered availability of mineral raw material for the realisation of national goals".

The policy further states that the exploitation has to be done keeping in view not only the present but also the long-term needs. The strategy for exploitation and development of each mineral shall be formulated and reviewed periodically on the basis of available resources. A thrust is to be given to the exploitation of mineral resources with which the country is well endowed so that industries based on these resources can come up to meet the needs of industrial materials for which the country depends on external sources (pg.6)[26].

While it remains a challenge for the policy planners and the environmentalists to confine the damage at current levels, the future outlook appears to be somewhat hopeful with the inclusion of environment in the charter of functions of Indian Bureau of Mines (IBM) and the creation of the Department of Environment at the Centre and States. But the introduction of an environmental element at the conceptual stage of a mining project, the incorporation of environmental science in educational syllabi, the creation of general awareness, the formulation of a practical code, afforestation, soil conservation and land reclamation programmes, dust generation, air survey, measuring noise and vibration levels, introduction of monitoring of the progress of remedial aspects, creation of effective information system etc. will go a long way to improve the situation[27].

In June 1992 Ministry of Environment and Forest, Govt of India released a policy statement outlining India's National conservation strategy on environment and development. "Sustainable Development" was the key phrase in the agenda for action as part of the commitment. Although the task has been set before the Government for the implementation of afforestation schemes, technological changes are highly dependent on global funding agencies. Nonetheless the objective set

by the Government to ensure sustainable and equitable use of resources for meeting the basic needs of present and future generations without causing damage to the environment is clear[28].

Although the policy makers have sought to shift the emphasis from defining objectives for each problem area towards actual implementation, the focus is on the long term, because pollution particularly affects the poor. The complexities are considerable given the number of industries, organizations and Government bodies involved. The problems of Environmental degradation can be seen in the light of those arising as negative effect of the very process of development, and those arising from the conditions of poverty and environment. (Hindu Survey of Environment, 1992).

The first category has to do with the impact of efforts to achieve rapid economic growth and development, continuing pressures and demands generated by those sections of society who are economically more advanced, and impose greater strains on the supply of natural resources. Poorly planned development projects are also often environmentally destructive.

The second category has to do with the impact on the health and integrity of natural resources (Land Soil, Forests, Water and Wild life etc.) as a result of

poverty and inadequate availability for a large section of the population of means to fulfill basic human needs (Food, fuel, shelter and employment). However, both these issues are interconnected.

Environmental degradation due to Mining:-

Keeping in view the Environmental problems associated with the mining industry, a report prepared by a working group under the Department of Environment enlisted as many as 20 minerals, both ferrous and non-ferrous including lead, Bauxite, copper etc., the mining of which have serious environmental implications and thus call for immediate attention[29].

Considering mining in its entirety the working group identified the following environmental problems to be of a serious nature though not necessarily in order of priority:-

1. Water pollution due to wash off of overburden wastes, discharge of mine water, discharge of tailings into the water bodies, acid mine drainage and coal washing operations.

2. Air pollution due to release of noxious gases into the atmosphere and generation of dust during various operations.

3. Land degradation due to large scale excavation disposal of mine wastes and talings and subsistence.

4. Landslides in the hilly terrain due to steepening of slopes during opencast mining operations.

5. Deforestation due to felling of trees for construction of roads. Fuel and woods etc.

6. Disruption of water regime.

7. Problem of noise and vibration due to blasting and operation of heavy machinery.

8. Human environment problems (settlements, health and allied problems).

9. Damage to sites of cultural, historical and scenic importance.

10. Problems caused by mine fires like land degradation, air and thermal pollution, disruptions of transportation (pg.5)

In order to take up a mining venture in an area, the project authority/company is required to make a preliminary study of the impact of mining on the Ecology, Environment as well as the socio-economic aspects. The working group recommended the Environmental Impact Assessement as follows:-

1. Preliminary environmental appraisal should be carried out in respect of all mining for clearance by the appropriate authority.
2. A comprehensive EIA shall be carried out in case of the projects where preliminary environmental appraisal so indicates.
3. The comprehensive EIA shall be carried out by the proponent and get approved from the appropriate apex authority for environmental matters (pg 12).

7.3 Five steps in the methodology of EIA :-

- Describe the project - identify the various activities including possible alternative methods of working which have environmental consequences
- Enumerate the impact - physical, chemical, ecological and socio-economic and health.
- Access the overall impact on environmental components.
- A summary of the methods recommended for control and abatement of environmental pollution due to various activities in the project.
- Proposal for the maintenance of various environmental components during the construction and operational phases of the project. (pg 12).

The environmental issues in mining activity are well documented. The above issues can be examined in the light of the practicability of application.

Governmental Action : The constitution of India subscribes to a social welfarist model of development, wherein it is envisaged that the state will promote the welfare of the people by undertaking important developmental and economic activities. In 1977, the preamble of the constitution incorporated "Socialist and Secular" principle making India a sovereign socialist Secular Democratic Republic."

Article 297 of the constitution states:

1. All lands, minerals and other things of value underlying the ocean within the territorial waters, or the continental shelf, or the exclusive economic zone, of India shall vest in the Union and be held for the purposes of the Union.

2. All other resources of the exclusive economic zone of India shall also vest in the Union and be held for the purposes of the Union.

3. The limits of the territorial waters, the continental shelf, the exclusive economic zone and other maritime zones, of India shall be such as may be specified, from time to time by or under any law made by Parliament.

Art. 298 states that the executive power of the Union and each State shall extend to the carrying of any trade or business and to the acquisition, holding and disposal of property and the making of contracts for any purposes provided that - a) the said executive power of the Union shall in so far as such trade or business or such purpose is not one with respect to which parliament may make laws, be subject in each State to legislation by the State; and b) the said executive power of each State shall, in so far as such trade or business or such purpose is not one with respect to which the State legislatrue may make laws, be subject to legislation by Parliament.

The economic activities of the State are required to be guided by the Directive Principles of State Policy, which are non-justiciable, but required to guide State policy. The DPSP lays down various considerations that must guide the State in its economic activities. Amongst other things Art. 38(2) states "The State, in particular, strive to minimize the inequalities in income, and endeavour to eliminate inequalities in status, facilities and opportunities, not only amongst individuals but also amongst groups of people residing in different areas or engaged in different vocations.

Most important however, from the point of view of development policies is Art. 39(b) which states : "that the ownership and control of the material resources of the communicty are so distributed as best to subserve the common good".

The constitution also provides for Fundamental Rights which cannot be taken away by any law. These were civil rights such as the freedom of speech, equality and son on. However, no law which is enacted to give effect to any directive principle could be void because it abridged any fundamental right. The development and economic activities of the State were therefore pursuant to the constitutional mandate to give effect to the DPSP.

In 1977, the constitution was amended to include the DPSP Art 48(A) which reads, "The State shall endeavour to protect and improve the environment and to safeguard the Forests and wildlife of the country.

As a matter of fact till 1972, at the time of the United Nations conference on Environment in Stockholm India did not have a single law dealing directly with the environment. For the first time in 1974, the Water (Prevention and Control) of Pollution Act was enacted. In 1981, the Air (Prevention and Control) of Pollution Act was enacted. The Environment Protection Act 1986,

was enacted against, "the backdrop of the Bhopal disaster, and a flood of environment related litigation in courts and the growth of active environmental groups all over the country". Alongwith these Acts, which apply to mining Activity, the Mines and Mineral (Regulation and Development) Act 1957 deals directly with matter regarding the Regulation and Development of Mining and Environment.

Governments' efforts to protect the environment may be discussed under four heads, which represent mutually evolving elements; such as legislation and standard setting; permitting, implementing and compliance enforcing[30]. In the light of the above elemetns an analysis of the environmental issues arising out of mining may provide certain insights and perhaps a clearer understanding about the nature of the limitations of the provisions.

An environmental permit (License of authorisation) is now regarded as a permit to operate. This is perticularly true for potentially polluting facilities. The purpose of the permitting procedure is to ensure that adverse impact of the activity on the environment is minimal. In India prior to 1'986, when the Environmental Protection Act came up, there was no such hard and fast rule in permitting a mining lease/project

or any operation from the point of view of environmental consideration. There was no statutory framework either for an environment management plan and its approval before taking up a mining project for implementation. Therefore, the problem involved in granting provisional permission and later examining the detailed plan were obvious due to progress made in project implementation in the interregnum.

There are essentially six steps in the licensing procedure (such as planning, application submissio, examination of the application by the authorities, issuing the permit, notification of the permit decision to the applicant, publication of the permit. (NRF Pg.198 Vol.18.3). Environmental clearance is a prerequisite for all projects seeking financial support from the Govt of India. For the private sector such clearance is required if the mine falls in reserved forest areas, which it often does."

The Ministry of Environment and Forests is eimpowered to grant clearance to any Project, Industry, Mining operations etc from environmental angle. The company or authority of the project are required to furnish details about mining plans, Environmental Impact Assessment Report prepared in accordance with the guidelines issued by the Central Government in the Ministry of Environment and Forests from time to time.

Thus India now follows a very cumbersome and bureaucratic procedure for granting persuits for mining. In the opinion of the Federation of Indian Mineral Industries (FIMI) acquistion of clearance under the Forest Conservation ACt 1980 and the Environmental Protection Act 1986, are akin to a passage through purgatory[31].

In 1986, the Central Government enacted the Environmental Protection Act, directly using Article 253 of the constitution, which states,"Notwithstanding anything in the foregoing provisions of this chapter, Parliament has power to make any law for the whole or any part of the territory of India for implementing in any part of the territory of India for implementing any treaty, agreement or convention with any other country or countries or any decision made at any international conference, association or other body." The Act was enacted to implement the Stockholm convention.

In this Act the term "Environment" has been defined to include water, air and land and the interrelationship which exists among and between water, air and land and human being other living creatures, plants, micro-organism and property. The Act also defines "Environmental Pollutant" to mean any solid, liquid or gaseous substances present in such

concentration as may be or tend to be injurious to the environment.

The Act empowers the Central Government to take all such measures as it deems necessary or expedient for the purpose of protecting and improving the quality of the environment and preventing, controlling and abating environmental pollution. These measures include among others-

1. Laying down standards for emission or discharge of environmental pollutants from various sources.
2. Laying down standards for the quality of environment and its various aspects.
3. Restriction of areas in which any industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards.
4. Laying down procedures and safeguards for the prevention of accidents which may cause environmental pollution and remedial measures for such accidents.
5. Laying down procedures and safeguards for the handling of hazardous substances; and
6. Examination of such malfunctioning, processes materials and substances as are likely to cause environmental pollutions.

As per the provisions of this Act, the enforcement measures regarding mining operations tend to be very strict. The Central Government has the power to issue directions in the exercise of its powers and the performance of its functions under this Act. This includes the power to direct the closure, prohibition or regulation of any industry, operation or process of stoppage or regulation of the supply of electricity or water, or any other service.

It was the Stockholon Summit of 1972 that gave the Central Government absolute power to legislate concerning the environment. The conference focussed the attention of the international community on environmental issues more sharply than ever before. The agreed action plan at this conference included three major components, viz - detailed environmental assessment so as to make rational judgement about priorities for action, organized environmental management and supportive action in the form of laws, manpower, institutions and finances to implement the decisions so reached. Adequate legislative and supportive organizational measures at the national level were emphasized both at this conference and later at the conference on World Conservation Strategy (1980), to which India was one of the signatories [32]. This made possible to enact the laws for the Central

Government which was not otherwise possible given the constitutional provision and increasing tensions between the Centre and State. Art. 253 of the constitution provides, the Central Government may legislate in respect of any subject in the state list if it is for the purpose of implementing any treaty, agreement or convention with any other country or countries or any international conference, association or any other body.

The Water (Prevention and Control) of Pollution Act was enacted in 1974. By then it was clear that the international situation had changed and the global concern for environmental concern was growing, the Union Government thus had the upper hand [33]. The process of this Act that began in 1962 was completed in 1974. By this time five states had already passed resolutions seeking union legislation. When the Act came into force it was not applicable throughout the country. By 1978 only 15 states had adopted the Water Act. Among the states that opted out of the Act were Andhra Pradesh, a large state rich in mining especially coal. Other states opting out were Tamilnadu, Orissa, Punjab, U.P. (all upcoming aspiring industrial states) all the hill states of Arunachal Pradesh, Mizoram, Meghalaya, Sikkim, Nagaland, Manipur, Tripura also opted out. When the Act was passed, its application

was limited by its very terms due to the constitutional limitations inherent in the political system itself.

The Central Government also got the political legitimacy for its actions regarding environmental regulations. Now the States could not say it was only due to the overbearing Central Government wanting to subordinate the States[34]. Under the EPA 1986, "Water" is defined as a component of the environment. Under this Act, the Central Government went ahead and framed rules, setting effluent discharge standards for the whole country. Now the entire subject of water pollution control was under Central control and the Art. 252 resolution becase redundant, as, if the states did not adopt the Water Act, they would still be bound by the EPA 1986.

Under the Sec. (24) of the EPA, 1986 the standards set out in the Act prevail over the state standards. Only by the Amendment Act of 1988 could it be said that the Water Pollution Control Act was finally in place. Before the Act was limited in its' application to specified types of pollution, pollution was essentially looked at as a health and sanitation department problem. The central law, when it came about, had clearly given it a character of industrial pollution control. Adopting the Act by each and every state was along run process spreading over until 1990.

The Air (Prevention and Control) Polution Act of 1981, was equally on weak Act by that time. The term "Air" by itself was not listed as a subject in the Central for state list as it was not seen as a "resource" or a subject for legislation. This Act was enacted after the Stockholm Conference under the provisions of Art. 253 of the Indian Constitution and the obligation perhaps to enforce international covenants. It was not that the Central Government wanted to go all the way to pursue environmental policies and the States were coming in the way.[35] The Central Govt. had its own misgivings about it, the fear that development would be retarded putting India back into its Colonial State. The Central Govt. not on the one hand, under the international pressure to do something about the appalling state of the environment in the sub-continent. On the other hand, there was the fear that the enviroment was also a resource and if something was not done to conserve this resource, there could be no development whatsoever. The States were not directly under such international pressures, external affairs being the subject of the centre.

The Mines and Minerals (Regulation and Development) Act, 1957

This Act came into force on 1st June, 1958, in supercession of the Mines and Minerals (R & D) Act,

1948. Comprehensive amendments were made in the Amendment Act of 1986. It made important changes and also introduced some new provisions from an environmental perspective. Before that, the 1957 Act did not have a single provision regarding environmental protection. The Act empowers the Central Government to make laws and rules for regulating the grant of prospecting licences and mining leases. In the interest of regulation of mines and mineral development, preservation of natural environment, control of floods, prevention of pollution or to avoid danger to public health or communications to ensure safety of buildings, monuments, or other structures, for conservation of mineral resources or formaintaining safety in mines etc. The Central Government may request the State Government to make a premature termination of a prospecting licence or past thereof.

The Central Government is also empowered to make rules and give directions for the safe disposal or discharge of waste slime or tailings arising from any mining or metallurgical operations carried out in a mine.

The Mineral Concession Rules of 1960 have also a direct bearing on environmental issues. Under the provisions of these Rules, the State Governments are empowered to incorporate conditions in the mining lease

relating to compensation for damages to the land and the delivery of possession of lands and mines on the surrender, expiration or determination of the lease. In the model form in the Mineral Concession Rules, 1960, certain powers and privileges of the leases are mentioned. The lessee should in no way foul or pollute any stream or spring. It is, therefore, seen that though some vague references are there relating to land use and water pollution, there is no specific provision regarding land reclamation in the Mineral Concession Rules, 1960 nor in the MM(R&D) Act, 1986). Even though Rules and provisions regarding environmental degradation are mentioned in both of the cases, there is a resemblance to the provisions of the EPA 1986, because the EPA 1986 provides a single focus on environmental issues in terms of all industrial activities. However, in the EPA 1986 also, there is no such clear provision regarding land reclamation of the mined out area.

An insight into the regulations and the conditions of these above provisions emanating from them clearly indicates that there is no provision for reclamation in mined out area. The 1993 Draft Mineral Policy has for the first time, taken this aspect as the strategy in mineral development and protection of environment. The mining operations must follow with a comprehensive-time

bound reclamation programme as well as a compulsory afforestation programme.

According to the existing provisions, the licensee has only to plug in the bore holes and fill up or fence the excavations in order to restore the surface of the land which may have been damaged to the extent as may be required by the authorities concerned but shall not be required to restore the surface of the land in respect of which full and proper compensation has already been paid.

According to the procedure and practices, the surface right as bought or rented by Licences means that the compensation stands paid. If the authorities concerned do not take up the surface restoration work for which the licensee has paid the rent or the fees, the surface remains damaged and environment gets degraded. So far as the forest and its products are concerned, the licensee or the lesee has only to take permission from the authorities concerned to enter the area and fell trees etc. on compensatory afforestation basis, but there is no such provision for land reclamation in the existing provisions although it is one of the major environmental problems.

It could now be said that India has a comprehensive legislation in place on its statute

books. The above Acts have bearing on environmental issues, and mining in particular. At the same time Govt. is armed with strict power for the closure and prohibition of any operation, if the project authorities do not comply with its directions. But, inspite of the fact that the long process of standard setting, framing rules, constituting authority and the rules, has yet to begin. The legislations, whatever with their own limitations, are only the beginning. Indeed, the evidence of an empirical Research undertaken by the International Mining and Environmental Research Network suggests, that the environmental performance of a mining enterprise is more closely related to its innovative capacity than to the regulatory regime within which it operates. The capacity to innovate is, in turn, related to the enterpreneurial characteristics of the firms, management, its access to capital, technological resources and skill, and the broader policy and economic environment in which it operates[36]. India is a case in point, when it comes to capital and technological resources. The country is highly dependent on foreign agencies. This fact has been reflected in the current strategy of mineral development, that induction of foreign technology and foreign participation in exploration and mining for high value and scarce material are needed[37]. Joint

ventures and foreign collaborations in the Indian companies or public sector undertakings are very common practices over the years and this need has been further encouraged. However, in order to fully realise this goals, by utilising the rich natural resources of the country, indigenous skill and technology are not at satisfactory levels.

Therefore, from the existing policy elements and the commitments which are urged as environmental imperatives, it is hard to determine what, on the ground, a field officer emplyed in the pollution control board do to resolve conflicting claims and what does a standard setting body do when the industrialist does not have the technology[38]? When one problem of environmental pollution is solved another problem arises. The enforcement agencies are everywhere plagued with problems of inadequate training, inadequate equipment and budgets. It is thus needed to look into the limits of political economics and the role the political environment plays in it. The latest figures released by the Ministry of Environment and Forest on March 30, 1993 shows a total of 1629 industrial units which were asked to install pollution control equipment or to face punitive action, including forcible closure. Some of the indusries are Aluminium plants, copper smelting, cement, ertilizer, thermal power etc. and of

these, 805 have complied exactly with the standards laid down by the Ministry. As many as 76 units have been closed down by the Pollution and Control Boards[39].

As Haden mentions, although the 7th Plan is clear that environmental protection and Industrial development often conflict, the proper balance between them is nowhere discussed. Moreover in neither the formulation of policy nor in the implementing standards are these goals clear; the inherent conflict between pollution control and other important economic values is scarcely even visible in these formal instruments of policy. Thus, as pollution control is implemented, there is no standard against which to measure industry petition or policy justification for a particular action[40].

Nonetheless, the set objectives and goals of the legislations and the enforcement of environmental regulations remains ineffective so far. Looking at the structural limitations of under developed economies like India, constitutional and legislative limitations, administrative inefficiency and the limitations of the judicial system, the set objectives and goals seems to be severely constrained. The Indian State has taken many steps (including the enforcement authorities) regarding environmental issues. Where there was no

legislation at all, a whole range of issues have now been legislated upon. It is found, therefore, that from the early 80s there was a definite change in the approach to environmental issues and thereby a sudden urgency. This is again witnessed in the flurry of administrative activities, constituting and re-organising boards and organisations, changing one Ministry to other. Administrative machinerey has been put in place. There are a number of Central pollution control Boards in various States. The Ministry of Forest and Environment is the Central Administrative body for the whole of the country.

In a democratic society like India, the politicians represent the people. And very often decisions regarding opening of a project or Industry are made at their direction and the pressures put upon them by the industrialists. The politicians want a clear support from all sections of people during elections. The politicians very often tend to keep the support of industry and the project authorties in the hope of getting regular support and election funding. Moreover, the Industrialists are more powerful that the rural elites. But whatever the weakness of the rural people, when they organize strong protest against environmental degradation and its social consequences, it becomes a political issue and the politicians take a

clear stance in favour of the common public. So long as the people are weak in terms of their consciousness and protest, any numbers of legal provisions to check the environmental degradation are of no use. Protest against industrial pollution and other environmental issues are sometimes marked by the contradictions of development itself. It is assumed by some that employment opportunities will be lost because of the protest. Therefore the feeling that environmental consequences are a part and parcel of industrialisation and without industrialisation backwardness will continue to pre-dominate their living standard.

Bauxite Mining in India:

Production of Aluminium : Bauxite is required for export as ore or for the production of aluminium. The ore given its importance in the manufacture of a strategic metal like Aluminium, has a world wide demand. It is generally found that, ore reserves occur overwhelmingly in the underdeveloped countries, while the production capacity and capability are concentrated in the hands of a few developed countries and their transnational cororations. There is an irony inherent in this kind of situation in which countries with bountiful resources of raw material have remianed poor because they lacked, for historical reasons, the technology and the capital needed to exploit them,

while the industrialised countries or their giant transnational corporations, with firm control over tehcnology and capital, exploited the resources of the third world[41].

India is a special case in the third world having abundant bauxite reserves, large potential for power, long experience in the production of aluminium through technology agreements with several leading producers of the world and potentially a large internal market[42]. India had huge deposits of bauxite estimated at about 2600 million tonnes, with about 77 percent being located along the east coast of Orissa and Andhra Pradesh[43]. This is greater than that in the rest of Asia and next only to the iron ore deposits in India. India ranks 5th in Bauxite reserves. According to the United States Bureau of Mines estimates, India has 5.7% reserves and 4.9% resources of the total world bauxite when it comes to Aluminium. It ranks first in India among non-ferrous metals both in terms of production and consumption. India has also the second strongest and most efficient aluminium industry in Asia after Japan.

In today's Industrial Civilisation, Aluminium is important because it serves as the basic input for a number of industries. But, for a developing country

like India it is the life blood of the economy, as it is inevitable for building up and strengthening industrial infrastructure in two sectors viz. Power and Transportation. Besides finding extensive uses in various fields of domestic use, aluminium has substantially replaced a number of older materials from their established uses e.g. Steel, copper, lead, zinc, glass, wood, paper etc. in order to save foreign exchange for the other materials of which import is needed.

India made a nominal beginning in aluminium Production in 1943 from imported aluminium. In 1950-51 the production of aluminium has 4100 t. It has since then steadily risen to 450 lakh tonnes in 1990-91. Correspondingly the demand for aluminium has also risen from 11,000 tonnes in 1950 to 2.6 lakh tonnes in 1983-84[44]. And the demand for 1984-85 had been estimated at about 3.10 lakh tonnes with likely imports of around 50,000 tones by MMTC in 1984-85 and domestic production reaching almost 260,000 tonnes. The market situation was easy. MMTC also exported about 700,000 Tonnes of bauxite in 1985, mainly to countries in the Gulf[45]. In the initial years the demand for aluminium was much greater than its domestic production. This gap considerably closed by 1970 (when the capacity was 156 Kt., production 169 Kt, and demand 174 Kt) and since

then the total installed capacity has been higher than the domestic needs. However, often for various reasons, principally the inadequacy and undependability of power supply, the actual capacity utilisation ratio has often been low. (Table 1) On the other hand, the increasing trend in the production of bauxite continues, from 65 thousand tonnes in 1950 touching the peak level of 5 million tonnes in 1990-1991. The spurt witnessed in the production of bauxite was due to the commencement of production in Panchapatmali bauxite mine of NALCO in Orissa which contributed about 2 million tonnes in the total production of bauxite in 1990-91 (Table 2 and 4).

Among non-ferrous metals, the production of aluminium which went up to 268 thousand tonnes in 1984 declined marginally during the next three years. However, it shot up to a new record level of 450 thousand tonnes in 1990-91 mainly due to the rise in the production of NALCO (Table 3).

Table 1: Production, Production capacity and Import of Aluminium in different years (Unit 000 tonnes)

Years	Installed Capacity	Production	Capacity Utilisation	Import	Export	Total availability	Import in tot availa
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1950-51	4	4.1	102.5	10.8	-	14.9	72.5
1960-61	-	18.3	-	25.4	-	43.7	58.1
1970-71	156	168.8	107.1	6.4	1.2	174.0	3.7
1971-72	173	181.5	104.6	21.2	-	202.7	10.5
1972-73	195	174.8	90.3	1.7	-	176.4	1.0
1973-74	210	126.6	60.5	2.7	-	129.3	2.1
1975-76	246	187.3	76.0	5.1	7.2	185.1	2.8
1976-77	266	208.7	78.6	0.3	21.2	187.3	0.2
1977-78	291	178.5	61.5	9.0	0.6	186.9	4.8
1978-79	321	213.7	66.7	32.2	-	245.9	13.1
1979-80	321	191.8	59.8	51.1	-	239.5	21.3
1980-81	321	199.0	62.0	117.6	-	309.1	38.0
1981-82	321	206.8	64.8	28.7	-	232.1	5.0
1982-83	321	208.1	65.1	19.3	-	227.5	8.5
1983-84	362	220	60.8	30	-	250.0	12.0

(Figures have been rounded upto the first decimal place)

1. Fig. for 1970-71 to 82-83 in Col. 2,3,4 are from the Economic Times, 24-8-83- REview of Aluminium Industry

2. Import figures Col. 5 for 50-55 to 52-83 are from the Report of the Working Group of non-ferrous metals. Ministry of Mines June 1993.

Table 2: Production of Bauxite 1990-91 (By Frequency group)

Production Groups (tonnes)	No. of Mines	Production for the groups ('000 tns)
upto 1000	68	27
1001 to 3000	47	80
3001 to 5000	12	50
5001 to 10000	17	119
10001 to 25000	29	463
25001 to 50000	18	674
Above 50000	14	3557
All Groups	205	4970

Source: Indian Mineral Industry at a Glance : 1990-91. Indian Bureau of Mines, Govt. of India, Nagpur Ministry of Mines, Oct. 1992.

Table 3: Production of Aluminad and Aluminium during 1981 to 1990-91 ('000 tns)

Year	Alumina	Aluminium
1981	482.5	212.8
1982	485.0	216.0
1983	443.0	204.8
1984	587.9	267.9
1985	587.3	266.5
1986	603.0	257.1
1987	737.8	264.8
1988-89	1292.4	357.4
1989-90	1439.8	427.2
1990-91	1352.1	449.5

Source: Indian Mineral Industry at a Glance : 1990-91 Indian Bureau of Mines, Nagpur - Oct. 1992.

Table 4: Decennial Growth of Bauxite Production - 1950 to 1990-91 ('000 tns)

1950	1960	1970	1980	1990-91
65	387	1374	1785	4970

Source: Indian Minerals Industry at a Glance - IBM, Nagpur - 1992.

As far as the status of exploitation of Bauxite mineral is concerned, out of the 207 mines reporting production during 1987 only 11 were under the public sector and the rest under private sector companies. The public sector undertakings, BALCO, NALCO, GMDC were located in Maharashtra, M.P. and Gujarat, and the private sector producers such as HINDALCO, INDAL, MALCO and others, operated their captive mines in Bihar, M.P., Maharashtra, Tamil Nadu.

India had kept the total capacity of 371,000+/year in 1985, consisting of HINDALCO 12,000+, INDAL 117,000+, BALCO 100,000+, MALCO 25,000+ and Aluminium Corporation of India 9,000+.[46] The installed capacity had been increased by 1988 to a significant extent by a total of 1587 thousand tonnes of aluminium per year, when the NALCO was commissioned having an installed capacity of 800 thousand tonnes per year (Table 5). The capacity utilisation of this installed target was

satisfactory with the production of about 1300 thousand tonnes of alumina in the same year (Table 3).[46]

Table 5: Alumina Installed Capacity ('000+/year)

Sl. No.	Company	Location	Capacity
1.	BALCO	Korba, M.P.	200
2.	HINDALCO	Renukot, U.P.	300
3.	INDAL	Belgaun, Karnataka	165
		Muri, Bihar	72
4.	MALCO	Mettur, Tamil Nadu	50
5.	NALCO	Damanjodi, Orissa	800
	Total		1587

Source: Working Group Report on Non-ferrous Metal, 1989

Bauxite export from India has not been significant in the initial years. The cummulative export from India during the 70s (71-79) was of the order of 0.3 mt against the total production 19 mt in 1979. The bauxite exports reached a maximum level of about 135,000+ in the 70s after which gradually dropped to a mere 18,000+ in 78-79 and afterwards it has shown an increasing trend again (Table 6). Taking into consideration a very comfortable position in bauxite resources and a growing trend in the production of this mineral, the country elevated a 2.3 million tonnes per year capacity mine is envisaged for export of bauxite

to the USSR in the 8th Plan. The project is likely to involve an investment of Rs. 428 crores including infrastructure and so on. The mine is recommended to have provision for expansion to 4.0 million tonnes in the 9th Plan period. During the 80s the aluminium projects of French Company (Pechiney) in the State of Andhra Pradesh was opened with 50% of the Bauxite meant for export to other country.[47]

Table 6: Bauxite Export (in tonnes)

Year	Quantity	Year	Quantity
1960	75641	71	53782
61	99293	72	27575
62	249121	73	28498
63	135170	74	18264
64	94423	75	14320
65	62832	76	21190
66	77936	76-77	34531
67	60873	77-78	42624
68	98916	78-79	18536
69	126020	79-80	45526
70	135035	80-81	84241

Source: Indian Mineral Year Book, IBM, Nagpur - 1961, 1966, 1977, 1982.

The planning for the development of industry for such a key material like aluminium requires greatest thought in anticipating demand and supply, planning infrastructure, ensuring availability of inputs and its benefit to the society at large, and also the response to emerging international trends since the world aluminium industry is an area of competition and this has definite implications for the developing country like India. So far as the planned development of the aluminium industry is concerned, the demand-supply projections are worked out by the Planning Commission, Govt. of India. On the basis of this planning, the position of aluminium is set in a planned manner in terms of the needs of the country. However, forecasting demand for a particular commodity is an extremely complex matter, because it has close interconnections with a large number of factors not all of which can be quantified or analysed, or which in certain situations, are even difficult to anticipate. Such factors, for instance, availability and production costs of rival materials, price elasticity of demand vis-a-vis relative prices of rival materials, general performance of economy, realistic integration with projection for consuming sectors, shifts of preferences and emphasis.[48]

For export considerations to be incorporated into demand projections, one has to look for factors like the performance of the world economy and its impact on the demand for aluminium, emerging structural changes in the world industry and their implications, development plan of different regions, countries etc.[49]

Apart from the methodology of forecasting demand-supply, production and import export, the working groups have differed even in terms of their treatment of factors such as scrap availability and export quantum as a component in demand and supply. Aluminium was taken into account till the report of the working groups for the 5th Plan and later the working groups have ignored it.

Table 7: Demand Forecasts of Aluminium for Various Years by Different Working Groups for 5th Year Planning

(Unit = Kt)

Years (1)	4th Plan (2)	5th Plan (3)	6th Plan (4)	7th Plan (5)	Actual Availability (Consumption) (6)
1973-74	274	230	-	-	149.45
1974-75	301	260	-	-	129.23
1975-76	332	290	-	-	185.10
1976-77	365	320	-	-	187.30
1977-78	401	350	-	-	186.94
1978-79	441	390	250	-	245.91
1979-80	-	-	275	-	239.46

contd...

(1)	(2)	(3)	(4)	(5)	(6)
1980-81	-	-	300	-	309.14
1981-82	-	-	330	-	232.10
1982-83	-	-	365	-	227.50
1983-84	-	630	405	263.55	220.00
1984-85	-	1015	445	292.06	250.00
1985-86	-	-	490	307.65	-
1986-87	-	-	545	324.00	-
1987-88	-	-	595	348.00	-
1988-89	-	-	650	383.00	-

In this table 5th Plan projections include 10% of the primary metal production as export uner total demand. Demand for the later years such as 78, 79 onwards does not include export.

Table:8 Aluminium availability in India
(50-51 to 82-83 tonnes)

Year	Production	Import	Export	Net Availability
1950-51	4045	10800	-	14845
1951-52	3967	9300	-	13267
1952-53	3476	6050	-	9526
1953-54	3908	5450	-	9358
1954-55	5564	12000	-	17964
1955-56	7450	16100	-	23550
1956-57	6836	11100	-	17936
1957-58	8015	10000	-	18015

contd....

(1)	(2)	(3)	(4)	(5)
1958-59	10287	9980	-	20267
1959-60	18011	11200	-	29211
1960-61	18317	25400	-	43717
1961-62	19883	20264	-	40147
1962-63	42639	33832	-	76471
1963-64	55779	19860	-	75639
1964-65	55121	20126	-	75247
1965-66	62058	20300	-	82358
1966-67	72959	32900	-	105859
1967-68	100362	38800	-	139162
1968-69	125284	9810	-	135094
1969-70	135054	2519	-	137573
1970-71	168784	6386	1177	173993
1971-72	181485	21236	-	202721
1972-73	174774	1664	-	167438
1973-74	144845	1605	-	149450
1974-75	126551	2688	11	129228
1975-76	187276	5063	7238	185101
1976-77	208687	336	21720	187303
1977-78	178687	9000	599	186939
1978-79	213729	32185	-	245914
1979-80	191825	51054	-	239458
1980-81	199034	117617	-	309139
1981-82	206766	28717	-	232100
1982-83	208144	19256	-	227495

Source Report of the working group on Non-ferrous metal Aluminium and Manganese June 1984

Since there are no figures available for the actual consumption of aluminium in different years the net availability has been treated as apparent consumption. Fig. 51-52 to 82-83 in (Table 7) indicates a brief period of 1975-77, when aluminium was exported in significant quantities, followed by a spell of heavy imports for 1978-79 onwards, which touched a peak level of 1,17,617 t in 1980-81. This is apparently a miscalculation of needs and mismatch of planning with emerging contingencies. The estimate of growth of capacity, production and demand during the 7th plan is given in table 8. In this 5th five year plan, it is seen that while the demand of aluminium is expected to be more than the estimated production till 1986-87, in the later 3 years of the plan the surplus of Aluminium is reflected and this availability which might make ti necessary to tie-up export agreement for the metal. With the entry of NALCOS' Aluminium production in 1988 the availability might have been higher than this.

Table 9: 7th Plan 1985-90

Year	Capacity Kt.	Capacity Utilisation	Production Kt.	Demand EcGr	Demand CGr	Total
1985-86	362	75	270	142	165	307
1986-87	362	75	272.5	142	178	324
1987-88	476	78	373	156	192	348
1988-89	580	81	471	168	215	383
1989-90	580	81	471	181	240	421

Source: Report of the working group on nonferrous metals Aluminium and Manganese June 1984

Table 10: Supply and Demand Position

	4th Plan						End of 5th Plan
	68-69	69-70	70-71	71-72	73-74	74-75	78-79
Total Availability	149	139	165	183	261	361	495
Demand (Domestic)	139	164	196	224	245	265	415
Surplus (+) Shortfall (-)	14	-25	-31	-41	+16	+96	+80

Source: Report of the Sub Group for Aluminium and manganese of the Planning Group, Aug. 1968

It appears that a shortage of metal persists throughout most of the 4th Plan period. The surplus in the last year of the 4th Plan would be only temporary as the demand would continue to grow during the 5th Plan period. In the 5th Plan period it was more than adequate to meet the demand.

Bauxite Mining Project: Case of Gandhamardan

The rationale of the mining Project and its location according to the decision made by the Government of India was based on three factors: the immediate needs of, and by implication the bauxite requirements of, the country: the cost of Production and of course the rich bauxite reserves in the region.

The Bauxite reserves in Orissa are estimated at 1,300 mt., that is about 57 percent of the total

Bausite reserves of the country. They form the larger bauxite deposits which covers 50,000 sq.km. and contains an estimated stock of 1900 mt. of Bauxite, which are among the largest of their kind in the world. The Reserves are confined in the Koraput, Sambalpur and Kalahandi districts. The Gandhamardan hills alone contain 213 mt. of Bauxite which is of a high grade.

BALCO, a Public Sector undertaking, has its Aluminium complex at Korba in Bilaspur district of Madhya Pradesh, and depends for bauxite supplies on the Amarkantak and Phutkapahar deposits. Its capacity is 200,000 t/y of Aluminium. Of its four 25,000 t potlines have been idle since construction in September 1978 due to power shorgates but were commissioned in 1984[50].

BALCOs' smelter output in 1984 was about 82,000 t, against 61,000 t the previous years. Since the Bauxite reserves in Amarkantak and Phutka Pahar reserves are limited, BALCO looked for alternative sources of bauxite beyond Korba plant to the mines about 300 kms away. The quality of the ore and the abundant reserves of it that could sustain the plant for at least four more decades were cited as the reasons for choosing the GM Mines[51]. The Mines would use mechanised technology, which would be cheaper than semi-mechanisation. All these factors suggested in a low cost of production. The low cost of production as has been suggested by

BALCO, however was the economic cost alone as the Indian development strategy for the exploitation of mineral resources does not take into social and environmental cost with account and it is these factors that generated the social tensions followed by vehement protest in the region by the local tribals. So far as the social impact of the mining is concerned it will be discussed in chapter V. In this chapter Environmental issues alone will be dealt with.

Mining essentially invovles environmental degradation and therefore, it should taken up only when it is absolutely necessary for the country. Unfortunately, there seems to be no national ore policy that governs the extraction of precious non-renewable mineral resources. In fact in the Indian Five Year Plans, as is shown in Table-7, 8, 9 and 10 the planning Commissions' working group on aluminium, do not even attempt to give the bauxite requirement of the country though it does given such data for aluminium. The implications of such a cultivated indifference towards national mineral resources are dangerous both to the long term national interest and to the environment.

It was suggested in some quarters that BALCOs' bauxite requirements could be met from the existing mines if the exports of ores were reduced, but this

question was never faced by the policy planners Instead, it is merely stated that BALCO immediately needs bauxite against the limited resources in its captive mines and thus GM mines were suggested as an unavoidable imperatives[52]. Even the Department of Environment suggested that though Bauxite is needed for the Korba plant of BALCO, this could be supplied from the NALCO Mines which were till then underdeveloped. In the mines of Panchapatmali in Koraput District, NALCO has a surplus of bauxite and no export orders, its mining operation could be expanded to feed the Bauxite needs of BALCO. Thus a great damage to 157 hectres of reserve Forest biologically rich, both in flora and Fauna as well as rare medicinal plants could be saved from destruction[53].

The control of extraction of ore and manufacture of primary metals by foreign powers becomes relevant for any discussion of the environmental impacts of mining. The link between the exploitation of bauxite reserves in developing countries and their processing and consumption in developed countries has traditionally been and still is provided by the six large multinational enterprises. The dominant role of these six multinational Corporations is founded on (1) Their original contol of Technology, (2) The large capital resources needed for bauxite mining and processing (3) The techology and managerial skills

needed for efficient production[54]. All these are major barriers to entry, because such resources have not been readily available in developing countries. All these factors, for reasons of history, have favoured industrially developed countries, particularly of the so called free market economies of the west, including their TNCs. They have tended to reduce the 3rd world countries to the role of suppliers of the high grade raw materials at cheaper rates. For instance in 1979 Japan and West Germany did not mine any bauxite but produced 1,010 Kt and 742 Kt of Aluminium respectively. By contrast Malaysia and Indonesia produced no aluminium but mined 300 and 1,301 Kt. of Bauxite respectively. USA mined 1,700 Kt of Bauxite but produced 4,557 Kt of Aluminium requiring about 23,000 Kt of Bauxite. India in the same year produced 1,952 Kt of bauxite, exported 43.7 Kt of it and produced 211.4 Kt of Aluminium[55].

The largest Aluminium producers have limited bauxite reserves: USA (40 mt) USSR (150 Mt) Canada, Japan, Norway, West Germany all have nil/or negligible reserves[56].

By contrast six of the 7 countries in the world, with over 1000 mt bauxite reserves are developing countries of the 3rd world. India being one of them and Austria being the 7th one. In fact 77% of the bauxite reserves, and 67% of the bauxite mining

companies, are located in developing countries but Aluminium refining and smelting are heavily concentrated in the developed market economy.

By 1983 only 36% of the aluminium production capacity and 21% of the Aluminium production capacity was estimated to be located in developing countries. India has about 8% of the world bauxite reserves,, 1.47% of the world bauxite production capacity (1983), about 1.98% of the world Alumina refinery capacity (1983) and 1.7% of the world Aluminium smelting capacity (1983). This figure changed slightly with the introduction of NALCO in 1984.

The working group on non-ferrous metals has shown that, there has been a gradual erosion in the real prices of bauxite from 1980 onwards because of the maipulative nature of multinationals. This is also one of the factors which accentuated the growth of alumina refining capacity in the developing country[58].

The six big TNCs include the Aluminium company of America (Alcoa, USA), Pechiney, Ugine, Kuhlaman (PUK, France), Swiss Aluminium (Aluswiss, Switzerland), ALcan (The Aluminium Company of Canada), Reynolds' metals Company (USA). Out of the six the first 3 represent the development market economy of the 1st world- their Governments and TNCs, which together own 63.5% producing bauxite mines of the world, 79.2% of the

world Aluminium refining capacity, and 71% of the worlds' Aluminium smelting capacity. By contrast, the figures for the developing countries were 23.4% for bauxite 5-6% Alumina, 7-8% for Aluminium capacity. This indicates the ownership pattern of the industry in table 11.

Table 11: Share in the world Aluminium indstury of Differet Owner Groups (% of World cap.)

Owner Grups	Producing Bauxite Mines 1978	Aluminium Refinery 1979	Aluminium Smelting 1979
Big Six TNCs	53.5	55.7	41.3
Other TNCs with Private investors in Developed market Economy (DME)	10.0	18.9	20.7
Govt. of DME Countries	-	4.6	9.0
Govt of Developing Countries (DC)	15.4	4.6	5.6
Private investors in DCs	8.0	1.0	2.2
Total	100.0	100.0	100.0

Source: TNCs in the Bauxite/Aluminium industry UN-CTC-UN, NY, 1981

During the period 1982 to 1986 there has been a notable gain in the developing countries' share of the production of alumina. The gain could have been further augmented but for the emergence of Australia with a larger alumina capacity under joint sector to

cater to the requirements of multi-national aluminium companies.[59]

Share of developing countries

		1982	1986
1.	Bauxite Production	55.0	45.25
2.	Alumina Production	23.0	27.97

It is seen that a substantial proportion of capital and technological resources come from abroad particularly to India. During the 70s and 80s there were five major companies operating in the country. Two of them BALCO and MALCO & NALCO came later as public sector companies. The other three are in the private sector, in two of which HINDALO & INDALCO, multinational companies Kaiser (American) ALCAN (Canadian) have equity holding. Later, on Pechiney (France) and USSR entered into an agreement with the Indian Govt. for new projects in the same time span. In this context, it should be noted that Indian' aluminium industries are also not free from the power and control of the TNCs. This has implication for the underdeveloped economy like India. Moveover, what is needed is the recognition that aluminium is a highly capital intensive and also highly energy intensive and again highly capital intensive. Thus, the mere showing of a record level of production does not tell the reality. The count on production target for the growth of Indian economy ultimately can be translated into the

benefit of the society as a whole. Foreign exchange savings, and earnings with the export and minimizing import of this commodity, seems to be desirable, but the question remains unsolved whether this production process would yield greater benefits in terms of foreign exchange, employment and increased incomes for the people. The level of environmental degradation again cannot be compared in monetary terms, although it is contradictory to development.

The mining in Gandhamardan is open cast mining and no chemical processing or treatment of ore is involved. Since the ore treatment plant is located at Korba, other forms of environmental degradation are recognised hazards of the project.

Firstly, the mining project involves felling of trees or complete stripping of any vegetation. The construction of ropeway, railways, townships, workshops and other parts of the Industrial complex all would require felling of trees. In fact, the people alleged that the work done so far had already involved felling of over 60,000 trees, this includes some illegal tree felling.

Even though the mining operations are limited to an area of 107 ha. only, and additional forest area of 55 ha has been acquired for allied operations and works, environmental degradation would take place over

a much larger area. Past experience shows that forest area directly distroyed by mining operations varies between 3 to 5 times the area acquired for mining operations. Area damaged indirectly and due to the influx of labour force as well as concentration of economic activities is manifold[60].

Taking an average forest density of 0.6 and applying the guidelines issued by the Forestry wing of the Department of Environment, the environmental cost of the loss of forest is calculated at Rs,126.74 lakhs per ha to accrue over a period of 50 years. For a Forest with a density of 1.0, the environmental cost would be Rs.76.044 lakhs per ha. Even at a conservative estimate of 500 ha of Forest Loss, the environmental cost alone comes to Rs.380.22 cores. This cost does not include the social costs such as drinking water, irrigation, flash flood measures, reduction in agricultural output in the vicinity, compensation and rehabilitation of the tirbals, presumption of religio-cultureal places, rehabilitation of flora and fauna etc[61]. By refuting this view of the DOE, the high level committee on environment and ecology stated that the vital aspects to be considered are the scale of operation, the magnitude of possible damage and the restoration of land and vegetation (1) It is clear that the extent of deforestation will involve 107 ha on the hill top which is a thinly

vegetated mining area. The effect of deforestation here will be insignificant, as out of the total forest cover of 20,000 ha along the hill slopes, only 55 ha will be affected by the mining, crushing and transporting of bauxite. (ii) If it is carried out with care and environmental guidelines are observed, to a large extent, the effect can be reduced.[62] Nonetheless, the were not convinced of such hopeful promise even by this high level committee and continued to resist on the ground that the disastrous consequences to the ecology of the hills cannot be left to BALCO. The latest committee under the chairmanship of Dr. B.D.Nagchoudhary in 1988 expressed the view that unless exploitation is suitably and carefully monitored, it can lead to disaster to the ecology of the area and that responsibility cannot be left at the hand of BALCO due to conflicts of interest that might arise[63]. Secondly, the principle of environmental consideration in mining is complete rehabilitation of the mined land, it has been rather neglected as the current practices show in India. Rehabilitation would involve the return of the quarried land to alternative land use taking adequate measures to arrest erosion, and establishing permanent vegetation cover which would aesthetically satisfy besides being produced. According to the view of the DOE, the reclamation of a biologically rich area essentially suffers because (i) the reclaimed area

cannot be suitable compensation for the loss of biologically rich forest which is destroyed through development activity. (ii) There is a considerable time gap between the destruction and reclamation. (iii) Reclamation is done over a limited are whereas destruction extends over a much larger area[54]. The complete rehabilitation of the mines out area generlly remains a distant goal. For instance the Phutkapahar mines of BALCO have reached the stage of exhaustion, and will be abandoned without specific measures for their rehabilitation. However, in the BALCO mines at Amarkantak, considerable care was being taken to raise suitable plantation etc. But the afforestation measures stared very late i.e. in 1979, although the mining started in 1970.

Thirdly these hills are the origin of more than 150 springs which fall into 22 major streams and four water falls. Many of the perennial springs are perennial only because of the good vegetation cover at present. Drying up of water springs throughout the country due to destruction of forest cover is a well known phenomenon. Mining operations would result in deforestation which in turn would not only deplete the water resources but would also result in serious pollution of of whatever water is left. Denuded slopes will increase the silt load manifold with corresponding decrease in the recharging of the ground aquifiers.

The local population in the area downsteam depend on the supply of water from these streams, and do not have alternative sources when the streams get dried or polluted. The changed hydrological cycle would also have an impact on the vegetation and microclimate in the area. The denuded slopes will contribute to a higher incidence of flash floods followed by drought[65].

Environmental issues can be dealt adequately only by adopting a holistic approach. The project authorities however, have consistently adopted a narrow approach limited to the project boundaries. Therefore, their emphasis has been on the questionable findings of extremely limited studies conducted to prove their stand. It has been stated, for instance, that mining will not adversely affect the streams and springs, whereas it is a universal phenomena that deforestation of a given area invariably results in the drying up of the springs and streams, especially in hilly areas. Mining operations all over the country have rendered the streams totally useless for providing drinking water and the population downstream have been forced to drink this water because there is no alternative. The reduction of the water level and the cleanliness of the water, according to the local peoples' view, is significant in this respect. Since the beginning of the mine testing works, the people have witnessed the changing level of water flow by measuring with a stick

at continuous interval and as the people stated, earlier everything below the water used to be visible and crystal clear, but after the mine testing and at the beginning of rainy season the water had taken a different form than before. The environmental management plan does not attempt on overall solution through a holistic approach.

Fourthly, Ore extraction in open pit mining produces a large amount of dust; subsequent operations like the transportation of mineral ore, grinding and granulometric sorting etc, raise even bigger amounts of dust. Blasting is also done during the construction activities and in order to loose the ore. Blasting is a source of danger to environment. Blasting can increase noise levels but more importantly it generates dust. The dust, alongwith the overburden of the ore washed by rains, can be carried. Blasting, according to local people, also led to the fall of Garuda Pillar of the Nrusingha nath Temple. The frightened animals came out of the forest clearly due to blasting. In addition, according to the local people, the minor irrigation projects at Khandijharan and Durgeijharan are alraeady affected by silting and the debris from the hill top has polluted Nrusingha Nath Stream. Among other things, Gandhamardan Hills are located in a reserve Forest area which is extremely rich in biological diversity, both flora and fauna, as well as medicinal

and herbal plants of great economic value. The mining operations might have caused serious damage to these precious natural resources. Although the Balco authorities suggested the possibility of relocation of the rare herbal and medicinal plants somewhere in the capital city of Orissa, the environmental monitoring group, based on their extensive field work, denied the suggestion on the ground that these kinds of plants grow in a particular micro-climatic envirinment and there is no possibility of its relocation or replantation elsewhere.

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CHAPTER V

PEOPLES' PERCEPTION ON DEVELOPMENT AND ENVIRONMENT

During 1980s, BALCO Hatao Andolan emerged as a strong grassroot level environmental movement against the opening of BALCO's bauxite mining project in the Gandhamardan Hills in western part of Orissa. Developmental projects of the Indian State have inevitably sought regional development, through progressive encroachment by the State on the rights and privileges of the people to forest resources. Development interventions as Vandana Shiva argues, aimed at the commercialisation of natural resources and involved a major shift in the manner in which rights to resources are perceived and exercised. They transform commons into commodities and deprive the politically weak communities of access to resources and rob resources from nature, to generate growth on the market for more privileged groups in the society. (V. Shiva, 1991). The case of BALCO's bauxite mining project cannot be isolated from the fact that the people and overwhelmingly the marginalised sections of them including tribals, women and landless labourers of the region perceived the project as their destruction and a hindrance in their way of life and livelihood.

The attractive inducements and promises of employment opportunities and other aspect of the development package such as schools, colleges, medical facilies etc. seemed for them a mere offering of charity by the BALCO. Whjat the people asserted in the movement was greater autonomy from centralised governance, arguing that their livelihood and lives themselves are critically dependent on the productivity of the local natural resource base and that they must have primary control over these resources. To this end, the Andolan provides an interesting debate over peoples' perception on development in contrast to the State mediated development through modern industries etc. As far as the people and their perception on environment is concerned, they understand very closely their relationship with nature which provides them with their sustenance. In order to examine the people's opinion regarding the project, a field survey was undertaken by the scholar himself during the month of October and November last year. The method of collection for this data from the people of the area was carried out through group discussions with the local people including tribals and women, interview was done by means of semi-structured questionnaires and also followed the observational method. For the purpose of understanding peoples' perceptions and opinions

about the project as many as 100 people were taken as a sample of all age groups and socio-economic background. Analysis of this data is indicated in Table 1. However, in this chapter, an anticipatory attempt has been made to analyse the peoples' response strictly on the basis of field work survey which may hopefully provide certain insights into the issue.

Table 1: Peoples perception on the project.

		Yes	No	Total
1)	(In retrospect) Do you think BALCO project was necessary for the development of this area?	12	88	100
2)	Who would get benefit from this kind of project?	(Responses)		
	a) Outsiders	52		
	b) Traderds and contractors	31		
	c) Farmers	5		
	d) Tribals/poor people	3		
	e) Local unemployed	19		
3)	Do you think such mining projects	Yes	No	No comment
	a) are indispensable for national economic development	10	38	52
	b) should be planned in such a way that it does not displace the people	51	-	49
	c) are meant only to help the rich	69	31	-
	Total	100		

The above three questionnaires were employed primarily to understand peoples opinion about the project. The data indicates that the majority of the samples taken during the interview were not in favour of the project. However, during the interview time careful attention was paid specifically to know the contradictory opinions of the tribals, the traders, unemployed yough and those who were already employed inBALCO jobs. The first question which had sought the peoples' opinion in terms of opening of the project, implies that over eighty percent of the collected samples did not support the project. In contrast, when it comes to the responses of the traders they favour it on the ground that their business would be benefited and expanded. As far as the benefit of the project is concerned, the majority opinion goes in favour of the outsiders. Whereas the tribals, landless labourers and the local unemployed declined to get any real benefit out of it. Question No. 3 is more general in terms of peoples' opinion about the developmental project. As the responses indicate, maximum number of people have no comments which implies the peoples' perception on development from an alaternative perspective. They feel that this type of development projects are meant only for the rich sections of the people. Perception on the movement and tough it was necessary were not uniform

among all the villagers who were interviewed by researcher. While the relatively well to do, upper caste villagers traced into the spiritual importance of the place and its glory in the religious traditions of local Hindus, the tribals explained it in term of their dependence on the forest in their day-to-day life. Forests for them are not just a source of aesthetic beauty and joy but primarily as an integrated indegenous source of livelihood in their quest for survival which forms a singularly important question for the tribals, the low caste dalits and landless labourers in the area. They do not view the forest and its eco-system as something outside their daily life, that was the primary reason due to which they participated in this movement overwhelmingly large number inspite of the low level of political awareness among these sections of the people. The intrinsic relationship between the traditional patterns of surviving harmoniously with nature, the cultural ethos of a primarly tribal agrarian economy and the socio-economic realities of such a backward region explain the background in which peoples' perception on BALCO's mining activities was conditioned. Both young and old participated in the movement. Student participants came not only from the universities and other colleges but also from the local Ayurvedic college. the high school students through drama performances had been the

most active supporters of the movement. All of them bridged an often difficult gap of age, class, region and social experiences as they joined in a common cause. The owmen had been prominent as leaders and participants. The high status of the owmen in the Gandhamardan area and especially among the tribal groups of the area that accompanied their role in the subsistence economy, was partially responsible for their prominence in the environmental movement. However, the women from relatively well to do social groups showed negligible even rare participation. Out of the total number of arrests during the agitation, more than 60% among them were women. The scene of the BALCO Project was and still remains deep-rooted in their mind. As the people argue, they feel it as their social problems and thus inevitably struggle to save the hills. So far as the tribal and the other marginalised sections of the people around the hills are concerned, it is generally seen that the women among these groups are accustomed to responsibility and leadership for the community survival. the collection of fire wood and fuel, fodder, char, kendu, leaves, mahua and other minor forest produce are primarily collected by the owmen. That was one aspect of the movement where the active role of the owmen in the Andolan was ensured, although it happened during the

second phase of the Andolan. The GSYP incorporated the female members in the Central Committee, the post of the organising secretary included a owmen which ensured the participation of the rural owmen in large scale. Very often it was seen as an urgent need to include women in any delegation sent to the Government offices etc. During the second phase of Andolan that is around 1987, the GSYP expanded its activities by farming villages and Panchayat committees and the people were drawn in on a massive scale. The Andolan spread to other neighbouring Block of Jarbandh, Gaisilet, Padampur etc. Likewise the Andolan had drawn grass-roots support from among the urban intelligentsia and through linkage with the urban groups elsewhere in India. People from the Chhatishgarh region of Madhyapradesh joined hands with Andolan activists actively mainly to save their religious place of importance. The andolan also spread around the bordering district of Balangir and Kalahandi people of all these areas took active part and supported the cause with a view to save the Gandhamardan hills. The integrative nature of the movement has that it cut across all social and cultural cleavages that might have been expected to be divisive. The Andolan united in a common cause people who differed by sex, age, religion, ethnicity, caste and class simply by stressing shared interest in saving the environment.

Although distinction between low and high caste and between religions and communities were there in the area; during the movement these were overtaken by the breaking down of all kinds of barriers. Earlier, the christians, Muslims and Hindus of the region never sat on a common platform, shared together. During the Andolan, in a number of occasions common kitchen served among all the people irrespective of their caste, religion and so on. The movement also had an integrative effect at the nationallevel, by bringing together people from various regions of a diverse country and by providing a prototype of methods and organisations for similar problems elsewhere in India. The methods of struggle pioneered in Uttarakhand for Chipko Andolan was one which inspired the Gandhamardan people. In 1986 Sunderlal Bahuguna was invited and shared his experiences among the rural people and the local intelligensia. The reason for the success of the Andolan was thus grounded in several factors such as large scale participation of rural masses particularly tribals, women, landless labourers. The movement through its organisation the GSYP provided an enlightened, committed and democratic leadership of the local yough. The organisation was mainly operated by the youth, while other played supportive and advisory role. Young people from all localities were given

responsibility. The decision making and decision about further course of action was done in a democratic way through general body meting and everybody had an equal right to raise their voice and opinion. The firm attachment with Gandhamardan as they call it their "Father and Mother" for the hills, forests and the temple reinforced their resolution to save it. That apart, consistent support of the teachers and students of Sambalpur University and other academic institutions, the favourable and wide media coverage from both local and national newspapers brought support from likeminded, democratic minded people from outside, moral support from various environmental groups, non-governmental organisation and human rights groups, voluntary action groups all together brought the success of the movement.

Strategy of mobilisation

The very context of the emergence of the Andolan was the village itself. Thus the leaders put their primary emphasis on grassroots level activism. Instead of beginning from the urban centres, the movement in fact originated and strengthened its base in the villages. The movement provided a decentralised and democratic leadership. Therefore, it stressed on producing leaders among the tribal women, men and the peasant society. It did not concentrate on any single

important cult figure or political personalities as the leader. It thus had a well knit and organised movement. Special emphasis was given to mobilising women and generating leaders among women in the agitation. Therefore, there was large scale participation of women in all the organisational activities such as Bandhs, demonstrations and protests which help to avoid violence and lathicharge. Thus, in peaceful way the movement went ahead steaadily with its sole aim to protect the hills and drive out the mining project. The broad discourse of the movement was based on its use of social resources from all regions, the movement thus expressed more or less subultern character insteaad of becoming an elitist one. In order to co-opt people of all kinds it took resort to local folktales, folksongs invoking images from local memories. The cultural groups performed drama for this purpose as part of mobilising the people's support in different part of the region. Padyatras, cycle rally, bandh, fast unto death and Rasta Roko programmes were carried out. In order to check the entry of the BALCO officials and its machinery to the region, gates were set up at four entry points to the region Salepali, Mithapali, Nrusinghanath gate, Baidpali gate, Durgei gate etc. and the people were employed to keep guard on the gate regularly day and night. Among all other things, the Andolan activists and the leaders united under the

singular objective of saving the environment in spite of their different social and ideological backgrounds. However, the Andolan saw the problem from a broader perspective by defining its scope beyond the interest of the region and in the interest of the nation at large.

Displacement and Propspects of Employment Opportunities in the Project

The beneficiaries of these kinds of development are almost exclusively outside entrepreneurs, their customers and political patrons. Most of them are absentee landowners from the plains; a few belong to the elite, educated, wealthy and influential residents of the area. On the whole, the local people are not even employed in the enterprise brought to the region by development. If employed they are at best porters, milkmen, guides or manuallabourers. Therefore, for the local people employment opportunities are rather bleak due to their low standard of education and literacy. BALCO promised total employment for the local people not more than 400 including skilled workers of which 276 jobs would go to the displaced families at the rate of one job for each family. Of course, there is an efficiency rider, the rider being that the jobs would be provided depending on the qualifications. Thus the efficiency rider can spell disaster for the displaced

families who are poor and illiterate and do not even posses the qualification for 276 odd jobs. In addition, there is no guarantee regarding identification of the local public within the region. Most of skilled category workers already employed were not actually local people. This could be understood in term of the contradictions between local traders who came and settled there with their business and the tribals of the area.

BALCO had already acquired land from 226 families for the work that had started. Of these 12 families had been completly displaced. But economic displacement was much more a matter of concern in case of the project. There are20,000 people living in 64 villages within a range of10 kms, which form the fringe of the mining area. Their livelihood would be affected if the water resources are reduced or the access to forest is restricted as a result of the mining. In other words, over a period of time, there was a possibility that more people would be thrown out of their existing work than those who would get employment, with or without bribes as a result of the Gandhamardan mines. However, the question of 12 families and their compensation or thousand of peoples properly damage is not as great consequences as the fact that the majority of tribals including 1 lakh people around the hills directly and

12 lakhs at the western side of the hills and forest would be indirectly affected due to mining. Peoples' apprehensions here was that the hills and forests are potential sources of the monsoonic rain in the region as a whole. Over long period of time the reduction in the agricultural output in the region raises apprehensions and serious concern. It is seen that the peoples' large scale involvement with the forest from the neighbouring villages, say around the fringe of 15 to 25 kms, is definite.

Table 2: Employment Potential in the Mines

1)	Total employment	650
2)	Supervisory, skilled etc	450
3)	Unskilled	200
4)	Staff from Amarkantak (Skilled category only)	250
5)	Unskilled workers from the local population	200
6)	Skilled workers from thelocality	200

On the whole, BALCO's defence is given at three levels. Firstly and quite predictably, it leaves manyquestions unanswered at the doorstep of other government departments.

Thus, the exact number of trees before felling operations was the state forest department's. Concern since the enumeration of trees was their job. Problems related with actual felling concern the Orissa Forest

Development Corporation. Secondly, minor irrigation projects are under Minor Irrigation Deptt. who may not have paid the same compensation amount granted by BALCO to those whose land was acquired or whose trees were felled to the persons concerned. Thirdly, to the BALCO the responsibility and accountability of other Deptt. may not be a mater of concern. But to the local people all the Deptts are part of the one and the same government. Therefore, it raised serious concern for the people in tree felling due to the construction of M.I.P. and mining operation. Thus while tree felling was not a mater of concern for the BALCO authority, but for the people, since it is their source of income and life-support system. They kept vigilant over the tree felling. The figures below indicates people's claim over the trees felled in contrast to BALCO.

Table 3:

	Operation	BALCO's figures	Peoples' figures
1)	Aerial ropeway	2,500	10,000
2)	Railway line	450	5,000
3)	Road construction	230	5,000
4)	Durgeijharan M.I.P.	452	5,000
5)	Actual mining	400	10,000
6)	Unspecified	Nil	25,000
	Total	4009	60,000

The justification for opening of the mines was based on the abundant reserves of bauxite ore but the reason for defending the project rest upon the present leased out area and its limited size. Although the lease was granted for over 953.09 hects covering part or the upper hills slopes and flat plateau top, BALCO agreed to surrender 660 hects, on hill slopes to the State government. Therefore the mining area was reduced to 300 hects only. It should be noted that once mining started in any area, it never stops till the resources are exhausted. Not only the existing plant that determines the ore extraction but also the ore availability determines the establishment of such plants. Therefore in the context of any mining operation talk of "present area of lease" has no significance for the total ecological system. An advertisement placed by BALCO as part of the public relations exercise presented the case of BALCO in heralding prosperity to the region. This BALCO release proposed among other things, the construction of a minor irrigation project on Durgeijharan a stream that was used by the villages down stream for drinking water, bathing and irrigation. The advertisement puts the expenditure on the MIP, at Rs.65 lakhs and expected an additional area of 180 acres to be irrigated in the drought prone region. But the

unfortunate part of this exercise was that the drought proneness characterises the neighbouring Padampur belt and not the Durgeijharan area,. Had it been a perenially drought prone region, the government of its own accord would have undertaken it. In general the discussion at the academic level postulates how to make the gainers compensate the lossers and how best to see that welfare is at the optimum. But in reality this case shows contradiction. the M.I.P. ignores the alternative indigenous technological use of the water of the stream along the length of this stream. The astonomical rupees 25,000/- per acre cost of the M.I.P. was possibily an indication of diversion of the water to an alternative use, namely the industrial use of the water and the domestic use of the water for the BALCO township. 180 acre is of irrigation to which the cost was attributed was simply like a drop of water. The diversion of water would only mount up the losses of the indigenous people who otherwise could have used the same natural resources dwon stream for their agricultural activities.

The contingent processes were having the necessary qualifications and accesses so that the people could be abosrbed in samll scale industries. The new local small scale industries have survived the unslaught of the competition that comes from the existing industrial

structure of the country; that the trading market structures do permit a reduction in the prices of imports into the region and increase in prices of exports from the region due to the railway line and road length; the open access to the school and Hospitals of the BALCO do create capacities in the poor and illiterate to use the facility and improve their living conditions. For a few of the local rich, the infrastructural and overhead facilities might compensate for the losses but for the vast majority which constitute the land-less poor and tribals called people below poverty line, all these facilities in the ultimate analysis were mirages as proved in the contemporary experiences. The holistic view of such development asks them to sacrifice but appeal to the individuals to use the infrastructure and other facilities and develop themselves via market forces.

CHAPTER VI

CONCLUSIONS

The discussions in the foregoing pages, show the crucial importance of ecology and environment. the issue of ecology looms large in the complex civilisational Mosaic of India. The diversity of ecosystem has nurtured a staggering complexity of cultural systems that have evolved diverse ways of human-nature inter-actions, bringing into being remarkable traditions of socio-ecological wisdom. The main aspect of these ecological movements is their integrative social effect on the region where they are active.

We have discussed the general overview of the environmental development debate in the post second world war period of industrial revolution and its' inevitable environmental consequences. This becomes important because the growth of environmental movement has been a historical development but not a sporadic movement. This movement had crossed many phases of its growth and development. In other words one can see the ongoing trend in this movement from passive consent to active resistance.

Socio-economic profile of the Paikmal Block have been discussed in the second chapter. Socio-economic aspects become important here to act or to react to any public policy made by the Government. Since socio-economic aspects of the person influence the politics, so as to study the politics of ecology - socio-economic aspects becomes more essential. In this chapter, a descriptive study of economic activity of Paikmal Block, its geography, topography, climatic conditions alongwith an account of infrastructural facilities have been discussed.

Political histroy of the BALCO Hatao Andolan in the context of BALCO project proposal and the way in which the withdrawal of the project had been taken place, have been discussed in the third chaper. Since the contemporary political developments of the region understudy cannot be separated form the contemporary politics of Ecology. Political history which centered around BALCO project becomes necessary. Basically two different groups widely different in their ideologies were actively engaged in the BALCO Hatao Andolan. Firstly, a group known as Nrusinganath and Harishakar Surakshya Samiti, which was spearheaded by the VHP became active with clear motives of protecting the religious place. This ideological group previously took interest in preserving the temple and streams

which are considered to be sacred, which are known as "pa[ajaran Tirth." Unfortunately, the activities of this organisation did not go beyond filing a writ petition in the High Court and gradually their activities dissappeared.

The other activist group perhaps, most important group which showed the real concern for the ecological problem and stood for the cause of the people, was the Gandhamardan Surakshya Yuva Parishad (GSYP). This group consisted of wider sections across the society. Many organisations like Hind Mazdoor Kishan Parishad, Chhatra Yuva Sangharsh Bahini and many ideolouges, adacemics, local tribal people, landless laboureres, women students of local colleges and universities etc. Due to the massive and active participation of people, it gained momentum with the mass-base agitation. Finally, the Government had to withdrew the project.

Another aspect of the environmental politics here involved with mining and mineral policy, of which the government had to share its won responsibilities in environmental degradation. These aspects have been discussed in the fourth chapter, particularly in the context of BALCO's bauxite mining. Environmental consequences due to mining have been reflected by a number of cases. For its obvious reasons, the eco-system of the region would become imbalanced. There

was intense and extensive disturbances in wild life, a lot of disruptions to the native animal and birds, and the Tribal were under stress. This mining operation severely might have caused economic displacement of local people. Water and Air pollution, land degradation, deforestation, noise and vibration were some of the environmental consequences due to the mining. A detailed account of emergence of mineral policy, problems and its prospects have been dealt with by bringing into focus environmental consequences due to mining in this chapter.

Finally and perhaps more importantly, perception of people in the context of Development and Environment have been discussed in our fifth chapter. It aims to critically analyse as to how the BALCO Hatao Andolan developed as a strong grass root level movement to save the environment. The important aspect of this movement is peeople's integrative social effect of the region. The people were involved, cutting across social and cultural cleavages who united but differ by sex, age, religion, caste, class by stressing shared interest in saving the environment. Remarkable feature of the movement was the prominent participation by women both as leaders and cadre. This was because their accustomed responsibility and leadership for community survival and as their work involves them directly and daily with

forests and natural resourves. They were alert to environmental changes and they responded readily and knowledgeably to the need of safeguarding the environment. The BALCO Hatao Andolan provides a model for the resolution of confiict over natural resources and strategy for human survival of ecological disaster. Finally, the government had bound to the demand of the people who fought constantly and consistently.

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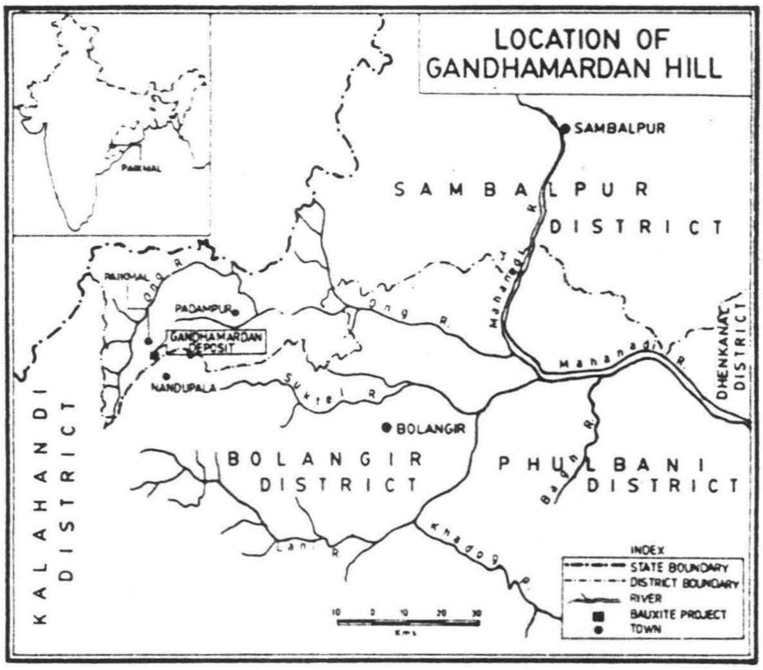

LOCATION OF GANDHAMARDAN HILL
SAMBALPUR
SAMBALPUR DISTRICT
PAIKMAL
PADAMPUR
GANDHAMARDAN DEPOSIT
NANDUPALA
BOLANGIR
BOLANGIR DISTRICT
PHULBANI DISTRICT
DHENKANAL DISTRICT
KALAHANDI DISTRICT
Mahanadi R.
Ong R.
Suktel R.
Lant R.
Khadag R.
Bagh R.
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STATE BOUNDARY
DISTRICT BOUNDARY
RIVER
BAUXITE PROJECT
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