

**STUDIES ON IMPACT OF PROPOSED
LANJIGARH BAUXITE MINING ON
BIODIVERSITY INCLUDING WILDLIFE
AND ITS HABITAT**



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Evaluation of the impacts of proposed Lanjigarh bauxite mine on wildlife values of the area

1.0 Introduction

1.1 Bauxite Mining: National perspective.

Bauxite, the most common among aluminium ores is the product of weathering of different aluminium rocks and is mined in many countries the world over near 98% bauxite is mined in tropical regions and those with Mediterranean climate. Bauxite is formed through leaching of soluble minerals, so it is not surprising that mines are generally situated in the areas of high rainfall (average 1487 mm per year). Bauxite deposits mostly occur associated with laterite capping on the hill plateaus at elevations varying from 700 and 2100 m.

Mineral production in India is dominated by bauxite, chromite, copper, iron ore, lead, manganese, limestone and zinc. India ranks fifth amongst bauxite producing countries in the world. According to the mineral survey in 1995, the total recoverable resources are approximately 2462 million tones, of which 768.2; 586.4 and 1107.8 million tones falls in categories of proved, probable and possible respectively. The major bauxite producing states in India are: Orissa, Andhra Pradesh, Madhya Pradesh, Gujarat, Maharashtra and Bihar. Orissa is the leading bauxite producing state constituting over 42% alone amongst all. The total bauxite consumption in India in the year 1998 was 5.4 million for production of aluminum and rest was shared by cement, refractory, chemical and abrasive industries.

The proposal for mining of bauxite in Lanjigarh has been conceived by M/s Orissa Mining Corporation Limited (OMC) to utilize the bauxite reserves in Orissa. The proposal has been moved by the project authorities for seeking relevant clearances under FCA (1980) and EPA.

2.0 Proposed Bauxite Mining Project.

Profile of Project

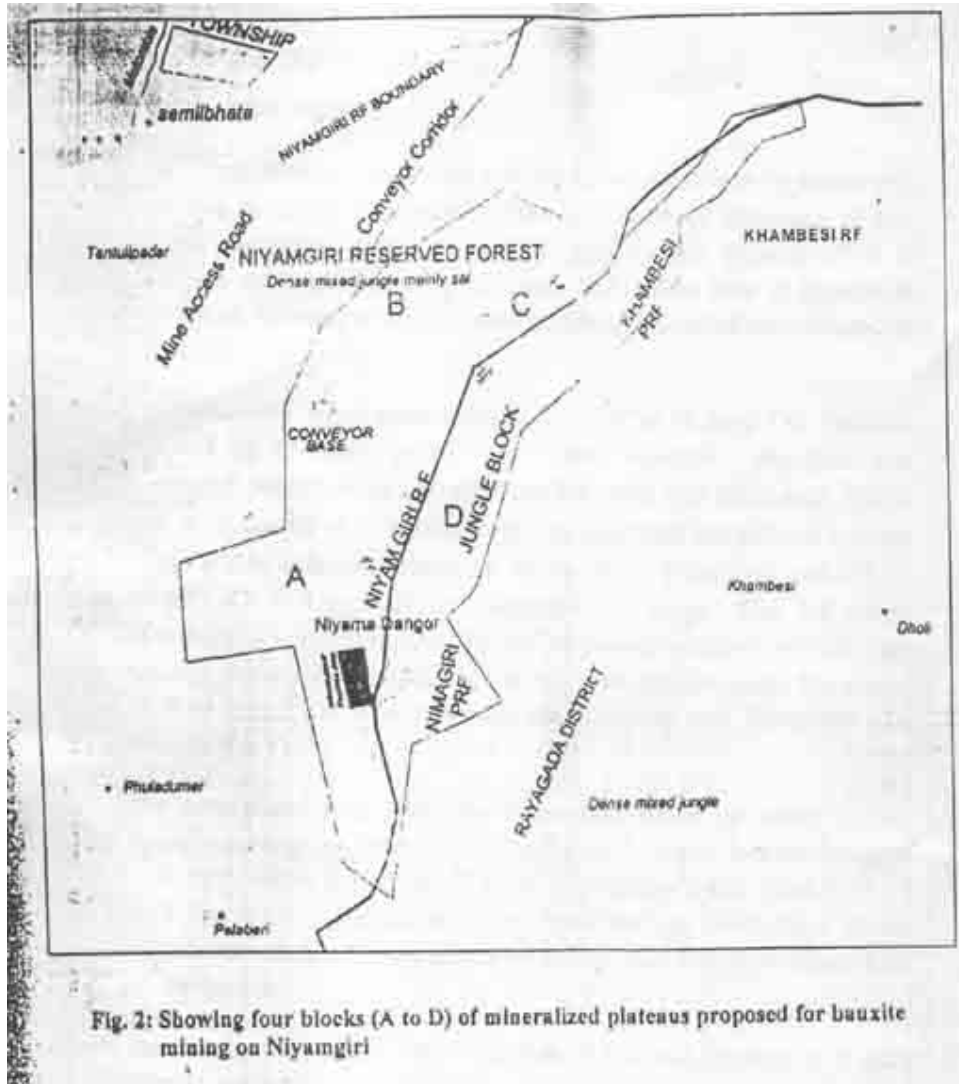
The Orissa Mining Corporation Limited has entered into an agreement with M/s Vedanta Aluminium Limited, a subsidiary company of M/s Sterlite Industries (India) Limited to develop the Bauxite mine at Lanjigarh as a captive mine to supply 3.0 million tons of bauxite to Aluminium Refinery Plant of Vedanta Alumina Limited also located at Lanjigarh.

The total mine lease area involves 721.323 ha of land. This includes 672.018 ha of forest land in two Forest Divisions – Raygada and Kalahandi (south) in the civil district of Raygada and Kalahandi, Orissa and a 49,305 ha of non-forest land. The proposed deposit has a sickle shape and is located-between 19⁰ 38' to 19⁰ 41' N Latitude and 83⁰ 22' to 83⁰ 25' E Longitude on Niyamgiri hill range. The hill range constitutes a massif block of 250 Km² hill forests. A prominent hill ridge running several Km towards NE to SE with highest peak 'Niyamgiri' 1516 m forms the boundary between Raygada and Kalahandi civil districts (Fig.1).

The mineralized area within the lease area would be mined in four blocks covering an area of 3.55 KM² (Fig.2) These include block A (1.16 km²); block B (0.30 km²); block C (0.36 km²) and block D (1.73 km²) The *in situ* mineable resources in all the four mineralized blocks as estimated in the mining plan is 78 million tons and 17.9 million tons of overburden.

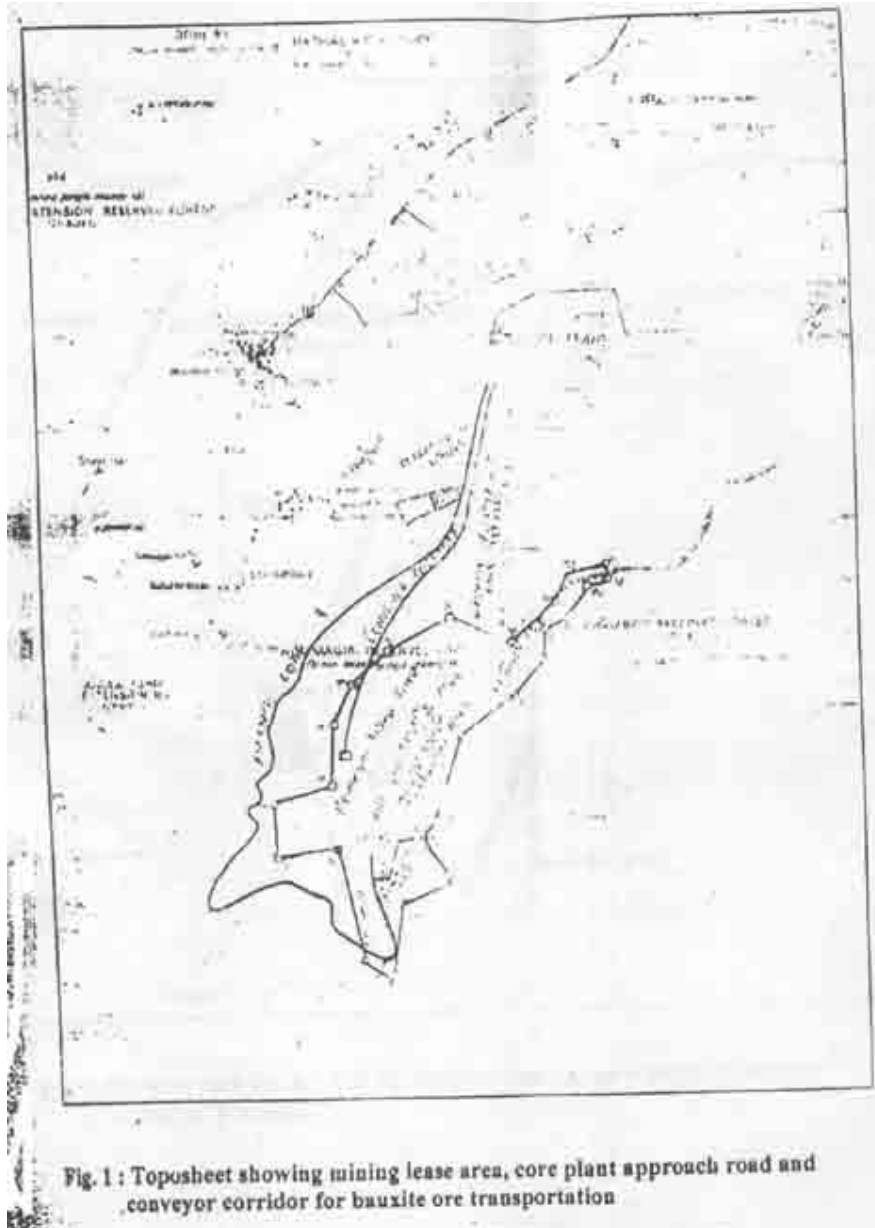
The ore to overburden ratio indicated in the mining plan is 1: 0.2. Mineral extraction would need removal of approximately 2.7 m of overburden thickness and 13.6 m bauxite thickness at any given places of four blocks. In view of the fact that the bauxite deposit in this area has low overburden thickness and high bauxite thickness. Open Cast Mechanized (OCM) method of mining with horizontal benching is proposed. Open cast conventional horizontal bench method (30 m width) along with traditional modes of drilling/ blasting or by ripping has been proposed for bauxite mining at Niyamgiri. Mining has been planned on north-south parallel along the contour by removing overburden at the top (average 2.7 m thickness). The loosened

material will be lifted through hydraulic shovel or by front loaders. The bauxite will be then carried to the primary crusher hopper or dump at the ROM bauxite stockpile.



An access road from the Alumina Plant at Lanjigarh (430 m) to the Niyamgiri hill top (1150m) is proposed to align along the western foothill toward southern side on gentle gradient of 5-60 (Figs. 1 2n 2). Main road on the plateau top are laid to connect general facility areas to the crushing plant. The total distance to the road from mine top to alumina plant is approximately 18 km (Fig. 1). To construct access road, overburden dumping area and other infrastructure facility on the hill top there is a plan to tree removal nearly on 30 ha forests. The site inspection report of the Deputy Conservator Forests

(Central) indicate that the total tree removal proposed involves 1,21,337 no. of trees from two forest divisions – Kalahandi south FD (41, 296 trees) and Raygada FD (80,041 trees). In mining lease area approximately 40% enumerated trees are situated while balance 60% are recorded on access road and other planned facilities.



With present proposed production rate of 3.0 million tons bauxite/ annum, the life of mining expected to be of 26 years with a sustained yield of processed alumina @ 1.0 million tons/annum.

3.0 Proposal for diversion of forests for mining

The approved mining plan outlines diversion of 672.018 ha of forest land in which mining will be taken up only on 390.26 ha. The remaining 281.758 ha. is not for operational purposes but has been included in the diversion proposals to make mining area contiguous block as required under Mineral Concession Rules.

The mining plan proposes forest diversion for which details are as given below:

District	Forest Div.	RF/PRF/PF/ in ha	Non-forests in ha	Total in ha
Kalahandi	Kalahandi (South Plateaus Blocks A, B, C) FD	Niyamgiri RF 358.890	49.350	408.195
Raygada	Raygada (Plateaus Block D) FD	Khambesi RF : 92.678 Nimagiri PRF : 70.246 Jungle Block PF : 150.204	-	313.128
	Total	672.018	49.305	721.323

The State Government of Orissa has submitted the proposal to the Ministry of Environment and Forest under Forest (Conservation) Act, 1980 for diversion of 672.018 ha forest land for mining of bauxite by Orissa Mining Corporation Limited.

The decision with respect to authorization of the proposed bauxite mining project is sub-judiced before the Hon'ble Supreme Court, which by its interim order dated 3.2.2006 in I.A. No. 1474 with I.A. No. 1324 in writ petition (civil) No. 202 of 1995 has directed that various studies to assess the impact of the project may be accomplished within three months.

A site inspection of the project area was undertaken by the Chief Conservator of Forests (Central), Bhubaneswar, Regional Office of the Ministry of Environment & Forests (MoEF), GoI. The site inspection report indicated that the biodiversity and wildlife in the area is likely to be affected adversely due to bauxite mining for which a further in-depth study will be required. This report also highlighted concern on the aspects of land degradation and soil erosion which may alter rain water flow and natural drainage systems.

The above proposal submitted by the State forest Department for Forest Diversion was also examined by the Forest Advisory Committee (FAC) constituted under Section –3 of the FCA (1980). The FAC also recommended that the studies related to impact of Lanjigarh bauxite mining of biodiversity including wildlife and its habitat be entrusted to the Wildlife Institute of India.

3.1 Task background and role of WII in assessment of the impacts of the project.

In pursuance of the recommendations of the Forest Advisory Committee (FAC), MoEF vide its letter F No. 8-23/2005-FC dated 9.3.2006 (Annexure-I) issued directives to the Wildlife Institute of India (WII) to undertake studies related to the impacts of mining on biodiversity including wildlife and its habitat in the proposed area.

Despite the fact that the directives from MOEF required adherence to stringent timeline of three months for the completion of the study, WII team initiated the above studies with the following objectives:

- i. Undertake a rapid appraisal of the area to review the profile of the project and the ecological context.**
- ii. Assess the impacts of the project on key wildlife values, endangered species and their habitat.**
- iii. Provide an overview of potential impacts as perceived through rapid appraisal.**

A desk study of documents (Mining plan, rapid EIA report and the proposal for diversion of forest provided by the project authorities and the spatial information in the form of maps of the study area mine plan and sections was first undertaken. The information base was further strengthened by referencing records of MOEF including site appraisal reports of the regional office of the MOEF, consultation with officials and wildlife experts. The relevant secondary information on the ecology of the project area, published and unpublished information on conservation values was also perused for the study.

WII team comprising of a team of scientist comprising Dr. Sushant Chowdhury, Scientist-F and Dr. Bivash Pandav, Scientist-C subsequently undertook the site appraisal during 3rd to 6th May 2006. The team of WII from 3rd to 6th May 2006: The WII team was assisted in the field studies by the following officials representing the Orissa Forest Department and the Project Authorities.

Forest Department, Orissa

1. Shri Subhash Chandra Swain, Conservator of Forests, Kalahandi Circle.
2. Shri Ananta Kumar Prusty, DFO, Kalahandi (South) Forest Division.
3. Mohd. Hanif, Assistant Conservator of Forests, Raygada Forest Division.

User Agency

1. Shri P. K. Bhattacharya, Additional General Manager (M), Orissa Mining Corporation Ltd., Bhubaneswar.
2. Shri Mrityunjaya Lenka, Assistant General Manager (Geology), Lanjigarh Alumina Refinery Project.
3. Shri Y. S. Manian, General manager, Lanjigarh Alumina Refinery Project, Delhi.

The team of WII, Dehradun also organized pre-site appraisal interactions at Bhubaneswar with Sh. P. R. Mohanty, Principal Chief Conservator of Forests (General), Sh. S.C. Mohanty, Principal Chief Conservator of Forest (WL) cum Chief Wildlife Warden, Orissa, Sh. P.N. Padhi, Chief Conservator of Forests (Nodal), Sh. P. K. Mohan, conservator of Forests (WL), Bhubaneswar on dated 02.05.06 to get several first hand information on the bauxite mining project. A post-site appraisal meeting was also held at Bhubaneswar alongwith Sh. S. P. Nanda, Forest Secretary, Govt. of Orissa, Sh. P. N. Padhi, CCF (Nodal) on 7th May 2006.

4.0 Status of Wildlife values in a pre-project scenario

Based on the experience of conducting similar studies in the past, the WII team evolved a Pragmatic approach of visualizing the activities linked to the project implementation and developing a possible linkage between various project activities and their potential to bring about changes in habitat use by species or the changes in the habitat characteristics of the species known to occur in the project area. Based on certain assessment parameters like absence / presence of species in the areas determined through direct and indirect evidences, knowledge of movement and migration routes of key species like the elephant and the existing threat factors operating in the area, the existing status of the project area in terms of its wildlife values in the pre-project scenario was evaluated. The secondary information and discussion carried out with officials at Bhubaneswar and at mine site greatly supplemented the understanding of local issues and observations in the field.

4.1 Forest structure and vegetation characteristics of the project area

The project area is representative of the area in Zone 6-Deccan plateau as per the biogeographic classification and has important biological value (Rodgers and Pawar, 1988) Niyamgiri massif is the part of Northern Eastern Ghat hill ranges passing through several districts of Orissa south of the river Mahanadi and corresponds with the biotic province 6c of the Deccan plateau Zone 6c. Discontinuous range of mountains with broken hills and river valleys has terrain ranging from 400 m to above 1500 MSL. Niyamgiri is the highest

peak 1516 m in the massif. The forest cover on the Niyamgiri hill range as observed in the field is dense and will fall on average cover category of around 0.6.

The forests provide several vegetation communities such as tropical evergreen forests, tropical moist deciduous forests, dry deciduous mixed forests, moist peninsular Sal Forests, dense bamboo forests, scrub woodlands, open scrubs and grasslands. Tropical semi-evergreen forests are found along the stream courses and narrow gorges. This is a climatic climax of the hill range where several three species viz. *Persea macrantha*, *Dillenia pentagyna*, *Michellia champaka*, *Diospyros embryoptris*, *Toona ciliate* and *Ficus benjamina* etc. are found. Important middle storey consists of shrubs like *Ardisia solanaceae*, *Ficus semicaudata*, *Litsea monopetala*, etc. The tropical moist deciduous forests are extensively found in large patches all over the hills in Niyamgiri and Khambesi Reserve Forests. The top tree layer consists of *Pterocarpus marsupium*, *Xylia xylocarpa*, *Adina cordifolia*, *Bridelia retusa*, *Shorea robusta* and *Syzygium cumini*, etc. The herbaceous flora consist of *Curcuma* sps, *Zingiber* sps., *Phrynium placentarum*, *Hedychium* sps., many ferns and orchids. The extensive hill slopes and foot hills including greater part of the region are occupied by dry deciduous mixed forests. Sal (*Shorea robusta*) grows at lower elevation where soil quality is better. Other tree species are *Terminalia alate*, *Anogeissus latifolia*, *Buchanania lanzan*, *Dalbergia latifolia*, *Diospyros melanoxylon*, *Kydia clycina* and *Madhuca longifolia* etc. The shrubs *Helecteres isora*, *Holarrhena antidysenterica*, *Lagestronemia parviflora* and *woodfordia fruticosa*, etc. Moist peninsular Sal forests dominate north-west and south-west of the Niyamgiri hill ranges. Dense bamboo forests extensively occur with *Dendrocalamus strictus* in better moist regime *Bambusa tutda* and *B. aurdinacea* occurs at places. Scrub woodlands and open scrub forest are found in exposed dry area where forest fire and shifting cultivation are much.

This is further corroborated with occurrence of Malabar Giant Squirrel, *Ratufa indica* in good density during our field survey which is an indicator of canopy contiguous forests.

4.2. Conservation values of the area

Niyamgiri massif is important both from biological richness and functional standpoint. Fortunately this area has little shifting cultivation as yet compared to other adjoining areas. Niyamgiri massif forests links forests of Kandhamal district with the forests of Raygada, Kalahandi and Koraput civil districts. Figure 3 shows classified forest cover map in the categories of dense, open and scrub forests of Niyamgiri and its linkages with two adjoining project areas – Karlapat WLS on north -west and Kotagarh WLS in north-east. The area therefore has great conservation significance and functional importance for providing contiguous forest tracts outside the protected area and for providing an effective buffer for larger conservation units like the proposed elephant reserve.

The presence of flagship indicator species such as elephant in majority of Forest Divisions indicates availability of forest in spite of large forest area suffering from shifting cultivation or Podu. This value has prompted the Forest Department, Orissa to propose a South Orissa Elephant Reserve (ER) comprising four civil districts of Kandhamal, Gajapati, Raygada and Kalahandi to 'Project Elephant', GOI. The five Forest divisions – Baliguda, Raygada, Kalahandi (South), Kalahandi (north) and Paralakhemundi within above 4 civil districts constitute the ER comprising an area 7713 km². The elephant habitat within this is represented by three notified sanctuaries – Kotagrah (399 km²; Baliguda FD), Karlapat (175 km²; Kalahandi South FD) and Lakhari Valley (175 km²; Paralakhemundi FD). These sanctuaries altogether constitute only 10% of the ER, while remaining 90% habitats are interspersed with forested (approximately 50%) and traditional agro-ecosystem (approximately 40%) where subsistence farming is still practiced without much modern involved technology.

According to the estimation of elephants in May 2002, there are 179 elephants in the proposed Elephant Reserve covering areas of five forest divisions. The crude density of elephant in the Reserve is very low around 0.02/km². Though there is no comprehensive assessment undertaken for crop depredation by elephants in this area yet human casualty in terms of

conflict is low as per the report available 6 persons became the victim of elephant kill between the years 2002 to 2004. Elephants in south Orissa will not have any future unless integrated landscape conservation is planned by securing South Orissa Elephant Reserve and protecting crucial habitat linking corridors. There are large number of other endangered wildlife in the region that are represented by tiger, leopard, sloth bear, wolf, pangolin, palm civet, gaur, giant squirrel, mouse deer, barking deer, four horned antelope, sambar etc. Their future conservation prospects are directly linked to landscape level conservation that is critically conditioned by integration of protected areas and establishment of corridors. Landscape integration through constitution of ER will also be especially essential to this area as shifting cultivation is major decimating factor for forest and wildlife values.

4.3. **Specialized habitats represented in the project area**

Niyamgiri hill range has some special wildlife habitat in forms of hill plateaus where laterite / bauxite are principal minerals. This high plateaus are covered with grasses with stunted trees and shrubs. The dominating plant community in this plateau consists of grasslands of *Cymbopogon martini* in association with *Themeda laxa*, *T. aurundinacea*, *Phoenix acalis*, etc. Few stunted trees like *Shorea robusta*, *Buchanania lanzan*, *Emblica officinalis* and *Syzygium cumini* are found sporadically. In the EIA report of Lanjigarh Bauxite Mine, these areas are defined as unproductive and tree deficient areas, not useful for wildlife and forests. In reality, however, these plateaus are very productive with high occurrence of several herbivore and carnivore species. This kind of habitat is especially productive during the rainy season when water and grasses are available for several species. Elephants also visit these areas during rainy season when grasses are abundantly found in this area. These areas are also breeding and fawning ground for four horned antelope, barking deer and several other species.



The biodiversity, wildlife and habitat values can not be accounted in isolation without taking natural water distribution and their influences on them. Niyamgiri hills are source of the Vansadhara and Nagaveli rivers. Nearly 36 streams originate all around the Niyamgiri hill. Majority of the streams are originating from lowermost control of the Bauxite layer. It is believed that the Bauxite layer which is formed through leaching also acts as a layer for imbibing water and releasing it's slowly throughout the year. It is anticipated that the removal of this layer of bauxite will impact ground waters in the region, and consequently the quality of forested habitats.

4.4. Animal presence and habitat use of the project area by wildlife species.

From 4th to 6th May 2006, the WII team undertook a rapid wildlife assessment in and around the Niyamgiri hills. For assessment of animal occupancy and

utilization of the area by these animal, 14 circular plots of f10.3 m size in four plateau blocks –A (5 plot); B (3 plot); C (3 plots) and D (3 plots) were laid in the study area during the month of May. The table presented below shows the pellet density index as indirect signs of several animals utilizing the habitat in the mineralized plateau. As all these blocs were close to each other, the variation in the pellet density indices was due to habitat variables in term of grass conditions and aspects.

Sl. No.	Animals	Pellet Density index / ha \pm SE
1.	Indian hare, <i>Lepus nigricollis</i>	37.0 \pm 10.4
2.	Spotted deer, <i>Axis axis</i>	5.6 \pm 4.2
3.	Sambar, <i>Cervus unicolor</i>	18.3 \pm 7.3
4.	Barking deer, <i>Muntiacus muntjak</i>	3.5 \pm 2.8
5.	Four horned antelope, <i>Tetracerus quadricornis</i>	0.6 \pm 0.6
6.	Wild pig, <i>Sus scrofa</i>	1.06 \pm 0.9
7.	Gaur, <i>Bos Gaurus</i>	6.0 \pm 6.0
8.	Indian Porcupine, <i>Hystrix indica</i>	7.13 \pm 1.3
9.	Cattle	32.4 \pm 13.5

The pellet densities of various wildlife species indicate their moderate to high use in all the four plateaus. Indirect evidences of herbivores presence were also recorded based on several tree posts that were used by herbivores for antler rubbing. A large number of porcupine digging signs were also recorded from all the mineralized plateaus. From the outside areas of the investigated plots, scats of sloth bear were also recorded.

The data provided by the officials of Kalahandi (South) forest Division and Raygada Forest Division also indicated presence of tiger, leopard and elephants in Niyamgiri and Khambesi RF. In January 2004, five tigers / leopards pugmarks were recorded in Biswanathpur Range including one in Kidding RF of Kalahandi (South) Forest Division. On 25th April 2005, 23 elephants were sighted in Biswanathpur Range that includes Niyamgiri RF and Benbhata RF. During monitoring of tiger, co-predator and herbivore estimation from 18.01.2006 to 23.01.2006 in Niyamgiri RF, Pugmarks of leopard and leopard with cub, sloth bear and hyena have been recorded as reported by DFO, Kalahandi (South) Forest Division. Sings of tiger pugmarks were also recorded in Raul-Jhimiri RF of Biswanathpur Range. Besides that there were sightings of male and female sambars, barking deer, porcupine and rhesus monkeys in and around Niyamgiri areas. The ACF, Raygada also reported presence of bear, wolf in Paligaon beat and a group of twelve elephants in Potangipadar beat of K. Singhpur range falling in Niyamgiri PRF. In Raygada division a leopard and wolf pugmarks are also recorded in patraguda beat of Muniguda Rnage.

The field tracking by the WII team on a hill transact north face of Niyamgiri dated 05.05.06 also recorded a few days old dung of elephants Good water streams, cool and moist places were also seen while travelling along the hill fold. During summer, elephant uses such kind of tropical evergreen / moist deciduous forests habitats. We were informed by the local people that a group of 5 to 7 elephants were present in that area around five days ago for which during were recorded by us. In the same habitat we have also seen flock of Indian Lorikeet, *Loriculus vernalis* on the top canopy layers, clamber about the branches in flowers and fruits.

In the nutshell, it can be stated that the Niyamgiri and its adjoining area are excellent remnant forests and wildlife habitat available in the region. Occurrence of less shifting cultivation qualifies the forests and wildlife habitat much better than that of the existing Kotagarh WLS, which at present is suffering from shifting cultivation, fire and other human interferences.

4.5 Socio economic characteristics of the area

There are about 7 million tribes of different ethnic group that live in the forested tracts of the region. The forest products and agriculture yields sustain the basic energy requirement of tribal people and their domestic animals. There are two major tribes Sauras and Kondh practicing shifting cultivation in the region. Sauras are distinguished in two subgroups i.e. Langia Sauras and Suddha Sauras. While the former lives on hill tracts amidst forests and are shifting cultivator and food gatherers, but he later are plain dwellers depend on agriculture for their livelihood. Marginal farming of crops in podu cultivated areas is common millet *Panicum sumatrense*, barnyard millet *Echinochola colnum*, red gram *Cajanus cajan* and castor *Ricinus communis*. Home garden cultivations are predominated by crops viz. Brinjal *Solanum melanogena*, tomato *Lycopersicum esculentum*, bean *Phascolous vulgaris*, edible arum *Colocasia esculenta*, sweet potato *Curfcuma domestica*, ginger *Zingiber officinale* and Chili *Capsicum annum*.

The Niyamgiri hills are known to be inhabited by localized Knodh tribe known as Dongria Kondh who are primitive and schedule tribe of the state. Daspatnaik 1984 have illustrated an account on this tribe of Niyamgiri hills. The economies of majority of tribes are forest based, agriculture, labor and domestic animal husbandry. Around 40-50% of their annual income is derved from large number of NTFP such as siali leaves (*Bahunia vahlii*), Amla (*Embllica officinalis*), Harida (*Terminalia chebula*), Bhada (*Terminalia belerica*), Char seeds (*Buchanania lanzan*), Sal (*Shorea robusta*) seed, hill broom (*Thysanolaena maxima*) and honey etc.

5.0 Prediction of impacts on Wildlife values of the proposed project.

Bauxite from the Niyamgiri plateaus is proposed to be extracted through open cast operations. Various kinds environmental degradations and impacts are associated with this kind of mining. These are : geomorphologic changes, landscape changes, loss of forests; land degradation; loss of flora and fauna; loss of habitat; geo-hydrological and drainage changes; land vibration, shocks, blasting and noise; air quality reduction, water quality reduction; disruption of socio-economic dependencies and public health hazards etc. This report is restricted in scope to assess the impacts that are likely to affect forest structure,

use pattern of wildlife species occupying the area and the quality of the wildlife habitats that harbour diverse floral and faunal species.

5.1 Morphologic changes

Bauxites occur mainly on the flat plateaus ranging from 1218 m to 1306 m. These plateaus are gently sloping at 1:4 to 1:10. The mining plan proposes excavation of 78 million tons of overburden. During the restoration process, the gap in material created by the extraction of the bauxite ore will create a void for back filling and restoring the original topographic level of the mining sites. It is estimated in the mining plan that present topographic level after restoration will be lowered by 10-15 m. This will bring changes in geomorphology of the area and enhance several other consequences leading to soil erosion and impact on drainage and forest productivity.

5.2 Changes in quality and structure of wildlife habitats

Bauxite mining at Niyamgiri will bring several changes due to blasting and disturbances to the forested habitat over a period of 25 years. The mining plan proposes to have 3 working shifts of 8 h3rs each per day and 6 days per week. Working of the mine during night shifts would induce disturbances due to illumination of the Niyamgiri plateau area and pose disturbance to wildlife species more specifically the nocturnal animal. The illumination may restrict movement and habitat use and reduce occupancy and utilization by several species. This situation eventually will reduce elephant movements across Niyamgiri massif to Karlapath and Kotagarh Wildlife Sanctuaries and ultimately effect the population structure and there by its genetic diversity. Exodus of human population to mining site will enhance conflict with wildlife so to their losses in long run.

Bauxite mining in Niyamgiri plateau will destroy a specialized kind of wildlife habitat, dominated by grasslands and sparse tree communities. These kinds of sites are breeding habitat of many herbivores such as barking deer and four horned antelopes.

5.3 Loss of forest flora and fauna

Mine site preparation and access of road to hill to involve removal of prime vegetation cover from Niyamgiri RF, Nimagiri PRF, Khambesi RF and Jungle Block PF. This will impact several wildlife associates of this habitat and will also reduce the diversity of tropical moist deciduous forest mentioned above. The area proposed for clearing of trees for alignment of road also harbours giant squirrel a highly endangered canopy dwelling species that inhabit specialized habitats characterized by closed canopy forests. Destruction of trees in the road way area is likely to lead to the destruction of canopy cover critical for presence of giant squirrels.

Inevitably, exodus of people involved in mining activities will also exert pressures on residual natural resources. This will also create interference with resource availability to wildlife species and thereby further restrict use of area by wildlife species. Reduction in numbers of some endangered species of plants and animals in the long terms will be eminent and unavoidable.

5.4 Impacts on geo-hydrology

Bauxite deposits are embedded in spongy leached material in the high plateaus of Niyamgiri. These plateau beds underlying lateritic cap retains huge quantity of rainwater and allow water discharges to continue at slow rate through the emanating streams from their bases. Mining on this mineralized plateau will impact these aquifers in their discharges. There will be a fear of reduction of surface and ground water discharges in Vansadhara and Nagaveli rivers. This will eventually make the habitat drier and reduce its potential for productivity and biodiversity.

5.5. Long term impacts to conservation prospects

The importance of Niyamgiri massif forests with little shifting cultivation and better vegetation cover therefore assumes a greater role on the landscape as repository of biodiversity, forests and wildlife for their interactions and dispersal to the adjoining areas. The threats posed by the proposed project to this important ecosystem will lead to irreversible changes in the ecological characteristics of the area. The cost benefit ratio projected for the mining project is 1: 4.377. This does not account for non use values of the forests. This cost benefit value should not only take into account the material benefits of bauxite ore mining over a period of 26 years but should take into account the perpetuity of the resources and ecosystem services that would be provided by these forest in the future Compromising long term economic return therefore can not be an alternative for short term gains.

6.0 Constraints in assessment and project planning

1. The rapid assessment for biodiversity, forests and wildlife was carried out in summer month of May when diversity and productivity of bio-resources are less and unevenly distributed. An assessment period to cover the seasonally of events like migration, breeding and the phenology of the floral species is desirable for true assessment of the status of wildlife values of the area.
2. The assessment team could not take proper comprehensive view of current and future bauxite mining in the region in absence of prospected bauxite resources map in South Orissa.
3. The team however, has been informed that there are several large bauxite deposits that are occurring in the non-forest areas of Kalahandi and Raygada districts. Why the feasibility of exploration and exploitation of bauxite reserves have not been assessed for proposing bauxite mining in such areas and instead the reserves falling in sensitive habitats in the RFs / PF and other sensitive habitats of conservation importance are being increasingly preferred?

4. The landscape integrity the terms of biodiversity, forests and wildlife in the region can only be planned and ensured by undertaking strategic planning for future bauxite mining in the region.



N.B:-

Ministry of Environment & Forest had issued directives to the Wildlife Institute of India to undertake studies related to the impacts of mining on biodiversity including wildlife and its habitat in the proposed Bauxite Mining area at Lanjigarh, Kalahandi as per the recommendations of the Forest Advisory Committee. Two experts from WII visited the area and submitted their report to MoEF.

EPG, Orissa has reproduced that report for wider circulation. In the original report, some wild animals' photographs are placed in the report. Secondly, in the original report they have placed photograph of dense vegetation canopy of Niyamgiri hills in the cover page. As we don't have the photograph which they have placed in the cover page as well as inside the report, we have used the photograph available with us in the cover page. Further, we have also used the WII logo at the bottom of the first page, which has downloaded from their web site. In the original report they have placed same logo at the bottom of the first page. We have tried our level best to reproduce the contents of the original report.