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Views expressed in various articles belong exclusively to their respective authors and are not essentially that of OGSA -Dr Rajashree Das, Editor

EDITORIAL

We have been relentlessly putting forth our demands before the government at different levels and at different times. Our demands are most imminent & justified. Due to the apathy of the authorities, these are long overdue and have been reduced to mere dreams. It's time to reiterate them.

The Government in Steel and Mines Department is entirely dependent upon

OGSA

Newsletter

the personnel from the Geological and Exploration Wing to manage the mineral administration as well as exploration programmes of the state. But the Steel and Mines Department has always been apartheid in appreciating the problems and difficulties of the personnel of the exploration wing.

The foremost demand of the association is the upgradation of the entry level post to Junior Class – I. It has been justified time and again. Minimum qualification for the post of Geologist/ Geophysicist/ Petrologist / Geochemist is Post graduation degree (M.Sc.) in the relevant subject while in any other services of Government of Orissa it is just a graduate degree. The work of a Geologist/ Geophysicist/ Petrologist is purely scientific and research oriented involving 6-8 months of continuous field work every year in inaccessible hilly terrains and forests,, deprived of comforts of modern civilized society, to prove and assess the mineral resources of the state basing on which the state earns huge royalty and contemplates to set up industries.

The Directorate has introduced advanced technologies for mineral exploration like Aeromagnetic Survey, Geotechnical study, Geochemical study, Environmental study, GIS modeling, Gemological study to be at par with other organizations and the geologists successfully maneuver the responsibilities given to them. In view of their experience and expertise the geologists of this Directorate are deputed to other govt/semi-govt organizations as and when required, like OMC, IDC, ORSAC, Dam Safety, Directorate of Mines and others.

Since, higher qualification is required for a Geologist at the entry level, and he/she is pursuing scientific work for the mineral development of the state, there is a common feeling amongst the geologists that they are let down by the Government of Orissa by not being offered the upgradation of cadre. The state needs enthusiastic and dedicated young geoscientists in the coming years. Unless the pay structure and scale is lucrative, good students will never be interested to join. On the contrary, few officers of our cadre have already left the job. It is an alarming situation if the government is

serious for mineral development of the state.

The ever increasing number of vacancies in the base level as well as promotional posts is leading to a vacuum and will ultimately be suicidal for running the administrative machinery as well as carrying out the mineral exploration work, which is the very basis of existence of this directorate. At present, 15 posts of Geologists, 2 posts of Geophysicists, 5 posts of Deputy Directors and 6 posts of Joint Directors (L-II) are lying vacant. Moreover JDGs, DDGs and geologists have been deployed in Directorate of Mines for which workforce in the Directorate of Geology has been downsized substantially causing serious concern for implementation and execution of exploration programme.

DREAMS

With the present rate of T.E. allowance, a geologist can stay in the field for a period of 50 to 55 days whereas the exploration programme compels him to stay in the field for 6 to 7 months and as such the officers are forced to stay in field without any T.E. and face financial harassment.

The current arrangement for accommodation in tents in camps is very precarious and unsafe. Necessary arrangements may be made to provide good accommodation and better amenities in the field for officers and staff engaged in exploration camps.

Considering the nature of the job and involvement of serious professional hazards, Compensatory Allowance (CA) at 35% of the basic pay should be given to the officers engaged in exploration.

There should be Insurance Coverage for personnel engaged in mineral exploration as they are always exposed to vagaries of nature as well as threats posed by naxalites.

Special allowance/ incentive should be offered to the personnel deployed in KBK districts in mineral exploration activities.

It is high time that the Government breaks its slumber and acts towards the implementation of our demands. Until then, they are just dreams.

WHY IS ORISSA LAGGING BEHIND?

P C Vajani, Geologist

Do you know?

It is understood reliably that our State has exported 14.2 million tonnes of Iron ore, 0.48 million tonnes of chromite and 8,518 tonnes of mineral sand in 2009-10. The State also stood high to cater to the needs of internal consumption of economic ores by different mineral based industries in our country to the tune of 4.87 million tonnes of iron ore, 71.2 million tonnes of coal, 5.97 million tonnes of bauxite, 0.61 million tonnes of chromite, 0.46 million tonnes of manganese, 1.5 million tonnes of dolomite and 0.13 million tonnes of quartz. The list is not exhaustive and needs updating by taking into account the unreported production and transportation of different ores vis-a-vis clandestine illegal mining operations in different areas carried out in our State Orissa. What about semi-precious stones? The economic value of these minerals/ores is sky high. Where does the money go after all the above money generating activities, which could have made our State a 'Paradise of Prosperity' by the blessings of Goddess of Wealth? But why is Orissa still way behind compared to the infrastructural and economic developments of states like Gujarat, Karnataka, Maharashtra, Punjab and Chandigarh to mention a few. Let us think positively and collectively on this gigantic problem and join our hands unanimously to open the pathways of progress for our State Orissa. To achieve this dreamy scenario, the following work needs to be completed on a war footing by the Geoscientists of our state:

1. Preparation of a database of available economic mineral resources
 2. Computation of reserve position of economic minerals as per UNFC classification
 3. Computation of production figures of different working mines with monetary valuation for the last 5 to 10 years in order to chalk out the future prospects.
- Suggestions on this aspect are welcome.

STOP QUARRYING

D K Sahoo, Geologist

The area around Jankia of Khurda district, at an approximate distance of 45 km from State capital Bhubaneswar, exposes the rock types i.e khondalite, charnockite, granite gneiss, granulite and leptynite belonging to Eastern Ghat Super

Group of rocks. There are a number of exposures connected to N.H.5 by all weather and morum roads noticed in the areas, known by their local name like Kalinga, Khuamundia, Hatia, Dhania, Dhobi-Sankhali and Kaluchua hills. During the construction of Paradip port, a major portion of the high grade metamorphic rocks have been used as its construction material. Now these exposures are being leased out every year as a source of revenue for development of Lord Jagannath Temple. Hence, many quarries in almost all exposures are under exploitation for use as road and building materials only.

Considering the above facts, the systematic geological investigation was undertaken by DG (O) during the field season 2007-08 for locating and estimating the quantum of value added products like decorative and dimension stones around the area. After investigation the blocks of D/D stone were identified and the individual resource of productive, potential and defective reserve of each deposit was assessed in terms of million cu m. which reveals that the block size of almost all exposures ranges from 0.5m³ to 2m³ and even 5m³ block size can be extracted from Kalinga hill due to its wide joint spacing. These D/D stone blocks can be used in massive structural work from roads to sky scrapers due to their characteristics of strength, durability, compactness, low porosity, colour, designs and over all look. As per the granite conservation and development rules 1999 framed by Government of India, granites are now considered as major mineral for which the royalty is fixed by Rs.900/- per m³ for white and Rs.1100/- per m³ for jet black variety. Hence necessary steps may be taken to stop quarrying, emphasize on its value addition and multifarious use of the resource.

BAHUDA RIVER SPIT, A TESTIMONY TO SEA LEVEL FLUCTUATION

P C Mishra, Geologist

Marine Marginal Zones (MMZ) are sites for interplay of coastal processes in time and space which are reflected in the sediments deposited by each phenomenon. Surface and subsurface geological evidences over the southern spit of Bahuda River near Sunapurpeta in Ganjam district bear ample testimony to the depositional processes operated, in shaping the geomorphological units. Here coastal sediments comprising chiefly of various grades of gravel, sand, silt, clay,

calcrete & ferricrete impregnated with faunal bioturbations of varying proportion have been accredited in response to prevailing environmental conditions like marine, fluvial, fluvio-marine, lacustrine and aeolian coined with eustatic sea level fluctuations where each contributing their characteristic attributes.

Critical examination of the borehole cuttings indicates that leucocratic garnetiferous granite gneiss of Late Archaean to Proterozoic (?) provided the platform for sedimentation which occur at a depth of 43m from the surface around South of Anantrapur where it has suffered from pronounced weathering and kaolinisation. Its fresh counterpart occurs at a depth of 44.40m towards A.P – Orissa border over the Southern spit of Bahuda River. Granite gneiss is overlain by partly oxidized and partially consolidated sediment mixtures to fresh and unconsolidated sand in order of increasing antiquity which bears the signature of oscillating shoreline. Occurrence of *Gastropod* shell (*Conus*) at 39.35m depth level points towards onset of marine environment of palaeo-strand below which limonitised gravelly clayey sand with profuse lime kankar and rock fragments do occur. Lime kankar is suggestive of exposure of sediments to aridity and climatic fluctuations and are deposited by alteration of andesines present in the granite gneiss under fluvial processes. Commencement of marine sedimentation is marked by a thin rim of partly consolidated neo-conglomerate.

At least four cycles of deposition corresponding to marine transgression and regression have been interpreted along with three intermittent minor cycles basing on the textural & facies analysis of sediments of the vertical column & colonial association of shallow marine & marine organisms (*Pelecypods* & *Gastropods*). The borehole logs also spell about gradual increment of spit head from SW to NE in agreement with littoral drift and recession interfered with transgression since Last Glacial Maxima evidenced from the occurrence of coarser sandy sediments with marine shells at 28.5m to 15m depth levels in the southern part while the corresponding depth levels in the northern part exhibits estuarine sedimentations with colonial mats of shallow marine shells. So it is quite evident that spit building activity was in progress from SW where the high energy breaking waves kept the sediments agitated and suspended materials got winnowed and transported by nearshore currents and the quartz grains are essentially flattened

attesting a plunge zone environment of deposition.

Correlation of lithologs and present geomorphological set up indicates that initially Bahuda River was discharging into the sea close to the eastern edge of Patisunapur enclosing an estuary. Huge quantities of sediments deposited by fluvial as well as estuarine processes probably constricted the erstwhile estuary mouth contemporaneously. Following recession of shoreline the mouth shifted further NE & the river carved its own course to meet the restored sea level resulting in creation of an outer channel originating from Anantrapur in successive stages. Relict recurved spit heads of at least five phases in the estuarine channel southern margin corroborate to incremental growth spit with intermittent pause corresponding to sea level oscillations. The present spit is now covered with accretion of aeolian sands with development of *front-Intermediate-rear* dunes.

GEO-ENVIRONMENTAL STUDY: AN URGENT NEED IN MINING BELT OF KEONJHAR DISTRICT

R K Mohanta, DDG

Keonjhar District is endowed with vast resource of iron and manganese and for this reason a good number of MOUs have been signed to set up Steel and allied industries in the state. The demand for iron and manganese has grown up for internal use and abroad. Mining activities in this belt over an area of 1000 sq. km. has been intensified in order to keep pace with the demand scenario of iron and steel makers. Intensive mining in this belt enhanced the production and despatch of ores involving mechanised mining and improved / heavy transportation.

Rapid opencast mining and movement of vehicles of larger capacities are causing serious damage to land, forest, air, water quality and sound in the region. Moreover, more than 87 opencast mines (working and non-working) are existing in the district. Basing on the vastness of iron and manganese ores, 9 numbers of Induction Furnaces, 20 Sponge Iron Plants (14 in Joda Block itself), 13 Iron Crusher Plants and 22 Stone Crusher Units are working besides captive power plants, mobile crusher / screening units, washery units in and around the mining belt of the district. All these units are creating serious imbalance to the natural environment (air, water, land) with harsh sound pollution affecting directly the living beings. No industry does as much damage to air

WILL ANY OF EARTH'S LANDMASS EVER BE FLOODED WITH OCEANIC WATER?

M R Mahapatra, Geologist

Assume if the Earth would be rounded enough without mountains & oceanic depressions and let the whole water mass spread all over the sphere, then we would get the water level upto a height of about 2000 m over our head. Fortunately it is not merely a coincidence that Earth's surface is made up of 29.1% land mass restricting the water body in rest 70.9% with an average depth of 3800 m below the mean sea level. If the water mass is multiplied due to the melting of ice from the frozen area then what percent of the land mass would get submerged? Certainly, it is not 10 % of the existing land as calculated but very lower percentage than that because of the fact that in such case the average depth of the ocean would be increased up to 5000 m to accommodate the extra water produced by ice melting.

This concept is proposed by a new hypothesis '**THE ROLE OF HYDROPRESSION ON CRUSTAL EVOLUTION & TECTONIC PLATE MOVEMENT**'. This hypothesis developed by the author postulates that it is the mass of water which is responsible for the crustal evolution as well as land formation. For example if one will take a water- wet ball & spin it with a high speed it is observed that the water particles will throw out of the surface of the ball. That is due to the effect of centrifugal force developed due to the spinning of the ball. If the ball spins speedily the centrifugal force will be more than a slow spinning ball. The force is directly proportional to the velocity & can be calculated from the formula:

$$F = MV^2 / R, \text{ where } F = \text{force } M = \text{Mass, } V = \text{velocity } \& R = \text{radius of the Circle}$$

This experiment is simulated in case of the Earth. The water mass of the Earth tries to escape to the space with the centrifugal force as calculated but fortunately, restricted due to the gravitational force of the earth. A reactional force equals to the magnitude of the centrifugal force is generated according to the Newton's Third law that tells that every action have an equal & opposite reaction. This force is the centripetal force which is developed as the reactional force. So the whole water mass put pressure on the earth's surface as ONE UNIT because of fluid behaviour, to get the oceanic depression proportionate to the centripetal force thus generated. This leads the process of formation of oceanic crust which is as deep as average 3800 m below the mean sea level. Due to the flexibility of the crust as it is supposed to float over a viscous mantle, the rest part of the earth surface bulges out to an average height of 840 m above the MSL. The depth of water in the ocean & the height of the land mass will proportionately generated and depend upon the mass the water. The calculation is as follows:

Centrifugal Force of Earth $MV^2/R =$ Reactional centripetal force approximately

$$\underline{1.44 \times 10^{15} \text{ kg} \times 400 \times 400 \text{ m}^2 / \text{s}^2} = 2.3 \times 10^{19} \text{ Newton force}$$

6376000mt

Where M =mass of oceanic water V= spin of the Earth R = radius of the earth

This reactional force is compensated by the creation of the depression in the shape of ocean & bulging of the land mass proportionately as nearly three part of mass of water with specific gravity 1(one) creates one part of the land mass with average specific gravity nearly 2.5 . Again another force came in to existence i.e., the pressure of water which exert pressure on the sides of the oceanic crust walls & responsible for the movement of continents. Oceanic water amounts 1.445 X 10¹⁹ kg mass and its pressure calculated according to the PASCAL'S LAW FORCE=PRESSURE X AREA and PRESSURE = pgh where p=density g=acceleration due to gravity & h = height of water D=thickness of the ocean floor. Total pressure on 1 m column of the crustal block is calculated by the formula $1/2 \text{ pgh} \times h \times 1/3 (h + D)$

This huge force acted on the continental slope like the thrust of reservoir water on dam walls & distributed in different parts of the ocean. The imbalance in the distribution of such force causes continental drift & breaking of continents like Africa, South America, Australia & India from the Gondwanaland. This force also enables the oceanic floor to touch the Mantle to facilitate pouring out lava for the formation of Mid Oceanic ridges at the very low pressure zone under the sea. This Hydropressure theory also supplements the theories of Mountain building, theory of Isostasy, Ocean floor spreading, continental drift & Island arc which warrants more research.

quality as the power plants that burn coal. Heavy transport vehicles / excavators run by diesel emit carbon monoxide which is injurious to health. Generation of huge mining rejects/ dumps, discharge of washery units pollute the water quality of the locality. Drilling and then blasting together with the movement of heavy vehicles create severe sound pollution. The people living in this belt are prone to air, water and sound related health problems.

In view of the seriousness of the environmental pollution, it is essential to take up environmental impact assessment through geo-environmental study in form of land use / land cover mapping, water quality study, air quality study, noise level study, routine collection of meteorological data along with socio-economic study to bring out an effective environmental management plan at every stage of mining activities in order to protect the endangered living beings and to make the environment eco-friendly, healthier, greener, cleaner and harmonious with proper enforcement of law to control the pollution urgently.

RESOURCE SCENARIO OF IRON ORE IN ORISSA

S N Parida, DDG

Iron ore deposits of commercial nature necessarily are oxides (haematite & magnetite) associated with hydroxides (goethite & limonite), carbonates (siderite) and occasionally sulphides of minor quantities. The iron ore (haematite) is used as basic raw material for making steel. In India iron ore deposits are associated with Banded Iron Formation (BIF) of Dharwar age or their equivalents. Over 95% of haematitic deposits belong to stratiform group often cresting the hills & ridges. The depth of mineralization ranges upto 100m or even more. Iron ore deposits are widely distributed in states of Jharkhand, Orissa, Chhatisgarh, Madhya Pradesh, Maharashtra, Karnatak, Andhra Pradesh & Goa. The Indian Iron Ore Inventory as on 01.04.2005 shows the country's resource as 25,250 Mt. comprising 14,630 Mt. of haematite (+58% Fe) and 10,620 Mt. of magnetite (+38% Fe). Besides some iron ore deposits are known to exist over & above the listed ones, but yet to be explored in detail. When the resources of unexplored as well as undiscovered occurrences would be taken into account, the total ore potential could be deemed to be much higher than the present estimate. Simultaneously 50 percent of iron ore (magnetite) is located

within ecologically fragile areas of Karnatak and Goa having little future from view point of exploitation.

The major iron ore deposits of Orissa are of Dharwar age and restricted to Bonai-Keonjhar horse shoe shaped synclinorium (Jones, 1934) belonging to Iron Ore Supergroup (IOG) distributed in Sundargarh & Keonjhar districts. The western limb of synclinorium is less disturbed hosting iron ore with frequent intercalation of shale while the eastern as well as central part of the synclinorium is highly structurally disturbed contributing major share of haematitic ore of the state. The other deposits are Gandhamardan in Keonjhar district, Tomka-Daitari in Jajpur district, Gorumahisani-Badampahar-Suleipat belt in Mayurbhanj district. The reserve of haematitic iron ore in the state is estimated at 5075 Mt. as on 01.04.2010 which constitutes 35% of the total resources of haematite present in the country.

At the current rate of production as well as export, it is estimated that the iron ore reserves of the state will last for next seventy years. In this back drop, it is felt necessary for augmentation of total resources of iron ore to meet raw material demand for upcoming 49 steel plants in Orissa.

Strategy for augmentation of iron ore resources:

- Reassessment of iron ore through revised cut off grade. (45 - 50% Fe, 50 - 58% Fe & +58% Fe).
- Detailed exploration in vast unexplored or inadequately explored blocks as per UNFC guidelines.
- Searching for new iron ore bands below BHQ/BHJ by deep drilling.
- Reassessment of leasehold areas by close spaced drilling in 100mX50m grid pattern upto minimum 100m depth using UNFC norms.
- Prospecting of gap areas between leaseholds.
- Reassessment of magnetitic ore in Mayurbhanj district.
- Extraction of iron ore from BHQ/BHJ by applying R&D techniques.

Specific areas selected for detailed assessment of iron ore on priority basis to arrive at proved reserve (111) are:

- Malangtoli complex in Keonjhar dist.
- Thakurani-A in Keonjhar district.
- Badamgarh Pahar in Sundargarh dist.
- Mankarnacha Pahar in Sundargarh dist
- Jumka-Pathiriposhi area in Sundargarh

Thus by using state-of-the-art exploration techniques, scientific mining, suitable beneficiation technology, imposing ban on export of iron ore irrespective of grade as well as by optimal use the iron ore resources of the state can be augmented to meet the challenge.

SAMBARMALI BAUXITE DEPOSIT

T B Munda, Geologist &

M K Oram, Geologist

Large bauxite bearing plateaus i.e.

Karlapat-Pollingpadar, Niyamgiri, Kuturumali, Putulimali, Baphlimali, Keluamali/Khandyualmali, Sijimali etc. of Kalahandidistrict were explored during sixties. Besides the large plateaus, there are number of small bauxite bearing plateaus (associated with khondalite or charnockite) which were ignored at that time. But recently multinational companies and small entrepreneurs are looking for small bauxite deposits to cater to their own need of small industrial units. This necessity has urged the geoscientists to scan and explore the small plateaus.

Sambarmali bauxite deposit is located 4.5km south-east of Gunupur village in Thuamul-Rampur block of Kalahandi district. The deposit is features in S.I.T.S. No.65M/2 and bounded by 83°08'06" to 83°08'51"N latitude and 19°33'40" to 19°34'31"E longitude. Maximum height of the plateau is 983m. Average length and width of the plateau is 1.6km and 0.75 km respectively with an area of 1.3 sq km. The slope of the top of the plateau varies from 7° to 10°. Top of the plateau is partly covered by thin vegetation of Sal forest. The perennial first order streams raised from the plateau flow in all directions. Scarp sections are well developed and thickness of the scarp varies from 4.00m to 10.60m. At places caves are also developed in the scarp section.

Khondalite is the parent rock of bauxite. The trend of foliation of khondalite varies from N15°W-S15°E to N25°W-S25°E dipping 75° to 80° north-easterly. The deposit is lateritic origin and has been formed by the in-situ chemical weathering of the khondalite. The bauxite occurs as gently undulating blanket overlying the parent rock. The thickness of the overburden (soil, lateritic soil and laterite) varies from 0.00m to 5.00m. The bauxite is gibbsitic in nature, porous and has low specific gravity. The average grade of the bauxite is Al₂O₃-39%, reactive SiO₂-0.17%, non-reactive SiO₂-8.45%, TiO₂-3.09% and Fe₂O₃-28.02%.

THE TRUTH ABOUT HATIMALI BAUXITE

G Pradhan, Geologist and
D Sharma, Geologist

During the Field Season 2009-10, investigation was carried out to locate the bauxite bearing plateaux around Niranigurha and Pancharha etc., the areas lying to the NW of Panchapatmali and Maliparbat East Coast bauxite deposits. The area is a part of T.S. No. 65 J/13 and is bounded by longitude 82°54'00"E to 83°00'00"E and latitudes 18°50'00"N to 19°00'00"N.

There has been a lot of speculation and hype regarding the Hatimali Plateau previously due to its size and probability of bauxite occurrence, but no systematic study had been taken up so far. Hence it was covered in detail during the preceding field season by the geologists of the Directorate of Geology, Orissa.

The area belongs to Easternghat group of rocks and mainly comes under central khondalitic zone. The main rock types encountered in course of geological mapping are khondalite, quartzite, charnockite, variants of granite gneiss, leptynite, quartz vein, pegmatite and laterite /aluminous laterite/bauxite.

The Hatimali Plateau is the largest plateau in the study area. It is bound by Longitudes 82°56'00" E & 82°59'00" E and Latitudes 18°54'40" N & 18°52'10"N. It is extending in NE - SW direction having a length of 3 km and an average width of 200-300m. The plateau rises to a height of 1391 m above Mean Sea Level (MSL). During the study it was observed that the main plateau consists of khondalite striking N20°E-S20°W and dipping vertically. It was found to be devoid of any bauxite. It may be due to the fact that the plateau top has a very narrow base and also that the top is sloping to both sides. Hence it might not have had a suitable environment for bauxitisation.

Towards north western flank of the main plateau, 4 (four) small aluminous laterite patches have been identified. In all these plateaux, bauxite is observed at a height of 1000 to 1200 m. They are nearer to Niranigurha, Ledrigurha, Ambali Ambagarha and Ganeipadar villages.

Ganeipadar plateau is 1 km in length and has maximum width of 500m. The top is consisting of aluminous laterite with a flat surface. Scarp sections are developed both on southern and northern sides. After scanning it is found that 6mt thick

aluminous laterite zone is present which may be of metallurgical grade.

North western side on foot slope of Hatimali plateau, semi circular/elliptical aluminous laterite body has been identified having length of 500m and width of 300m. After collection of samples as grab and channel scarp it is found that the deposit is having a thickness of 6 m up to the lithomarge.

West of Niranigurha, a small patch of bauxite bearing plateau has been identified with a height of 1143 m. After study it is noted that 4 mt thick low to medium grade bauxite occurs over a length of 600m and width of 200mt.

One km south of Ambali Ambagarha, a 3 km long narrow khondalite plateau is marked, on which in the middle portion, about 500 m and 300 m wide area has been bauxitised. After collection of samples both from surface and scarp sections, it is found that about 4 m thick aluminous laterite horizon is present from top to the undigested khondalite/lithomarge zone.

OUR EFFORTS ARE BEING WASTED!

S Mishra, Geologist

Exploration activities of our Directorate have put Orissa at the top of the list of mineral rich states. Members of OGSA are highly experienced and capable technical personnel, who have braved adverse climatic conditions, inaccessibility of far flung peripheries of the state to bring about a gamut of mineral wealth that has made the state to stand out as the mineral hotspot in the entire world. The pursuits have added significant resources of more than a dozen minerals including iron ore, bauxite, manganese, coal, graphite, limestone and diamond to mention a few. Notable success stories are described below.

Discovery of a diamondiferous olivine lamproite pipe in the Kalmidadar village of Nuapada district has put Orissa in the diamond map of the world. This has been possible through persistent exploration efforts from the officers of this Directorate. Potential satellite bodies of the kimberlite/ lamproite have been discovered around Pokhanpadar, Supuli, Bharuamunda areas. This has attracted some international exploration agencies to crave for blocks in Orissa to discover more sources of primary diamond in the state.

Proving of more than 500 million tonnes of iron ore resources in Mankarnacha, Baliapahar and Khandadhar deposits of

Sundargarh district is a giant step towards meeting the requirement of upcoming iron and steel industry in this part of the country.

Assessment of 1000 million tonnes of bauxite resources through exploration in Panchapatmali (Koraput), Gandhamardan (Bolangir-Baragarh), Sasubohumali-Bhasangmali (Rayagada), Karlapat (Kalahandi), Baphlimali (Rayagada), Dholkata Pahar (Kendujhar) and other smaller deposits. The mining of these resources are bound to uplift the economic situation of the underprivileged KBK districts through increased direct and indirect employment, renewed infrastructure, health and education services.

31 million tonnes of heavy minerals (ilmenite, rutile, zircon, silimanite, garnet and monazite) have been proven in the beach sands along Orissa coast, making the state a proud host of rare earth minerals.

18 million tonnes of chromite ore have been assessed in the Sukinda valley alone adding to the already proven resources that secures an enviable no.1 position for the state in the country. Orissa today, holds as much as 98% of the chromite resources of the country.

Assessment of 4457 million tonnes of coal reserves in Talcher coalfield and 2445 million tonnes of coal in the Ib valley coalfield has accounted for a total proving of 9602 million tonnes of thermal (E to G) grade coal. This adds vital potent for a culminating iron and steel industry in the state in addition to generation of thermal power.

28 gemstone bearing tracts have been identified in the state in course of exploration, which has set an excellent platform for gemstone mining and gem based lapidary industry in the state. Lapidary work can account for a huge employment generator in addition to development of small scale industry.

Outstanding achievement have also been made in the exploration sector by adding sizeable resources of nickel, tin ore, vanadiferous magnetite, graphite, quartz, pyrophyllite and few other minerals.

Our endeavours have brought about a rush of interest and investment from national and international mining and industrial houses. But for strange reasons, the investors are gradually turning their back to the state. While states and nations all over the world are trying their level best to attract investment, we are wasting the opportunity. We already had

ample proposals for mining and industry in the state. All we had to do is put right things in the right place and perspective. But we have failed miserably. The news of Orissa being a bad spot for investment is spreading very fast.

PROTECTING ENVIRONMENT THROUGH MINING

S Mishra, Geologist

Environment is one of the major concerns of today's world. While there are a number of reasons for environmental degradation, 'Mining' is considered as the most prominent one. Media prefers to hold 'mining' responsible for the depletion of forest cover, pollution of air and water along with a number of other impacts. It is time to rethink.

Forests can be considered as the most important component of the environment. It is heartening to see that some of the most luxuriant forest growth (with a sizeable population of elephants) exists in the Joda-Barbil-Koira mining belt. The quality and density of the forests in this region can emphatically supersede some of the most protected sanctuaries of the state like Simlipal and Dandakaranya. The reason can be well attributed to plentiful employment opportunity to the people. Creating alternate employment can be considered as a powerful means of diverting the dependence of people on the forests. Large scale deforestation can be noticed in all non-mining areas of the state. The list is headed by the Kandhamal, Koraput and Malkangiri districts. Famous dense forests on both sides of Tumudibandh-Belghar road have now been replaced by vast fields of shifting cultivation.

Kashipur block of Koraput district, where any bauxite mining is yet to take place due to several reasons including environmental concerns, is nearly barren and devoid of any major forest growth. Most bauxite plateaus have nothing but grass on them. Even the grass dries up during the dry seasons. In the undivided KBK districts, only bauxite deposit being mined is the Panchpatmali, which has some nice plantation forests on its slopes, thanks to the efforts of NALCO. Transport of mineral by conveyor belt has made Panchpatmali free of any pollution, whatsoever. One has to see to believe the serene environment around the mines.

In East Coast belt, bauxite occurs as a layer of about 5 to 14m thickness on the top of the plateaus and does not occur on the slopes below that. The removal of the top layer is very less likely to have any visible impact on the hills rising above 900m.

Rather the forests can be insured through generating some employment for the locals by mining. Removal of the top hard and impervious aluminous layer will expose the soft and porous lithomarge, which will facilitate recharge of groundwater and raise the water table. Some NGOs with vested interest are propagating adverse news of possible depletion of groundwater and creating fear psychosis among the less educated locals in order to generate following. Forests in the Niyamgiri area can be effectively protected by allowing Vedanta to mine bauxite there.

Those who have travelled from Kendujhar town to Barbil in recent times (after the completion of the tar topped road) will admit that all the dust and mud that once covered the area, were due to lack of a proper haul road rather than 'mining' itself. Providing wider roads will also effectively clear up the traffic congestion.

If it was possible to do without mining, we would rather choose the same. But we have to burn the coal to produce electricity. Again, mineral wealth does not contribute value for ever. The tin toys we played with during our childhood have almost entirely been replaced by plastic ones now. The thousands million tonnes of bauxite that we own may suddenly become worthless due to the possible discovery of some strange polymer, which can replace aluminium. By then the Australians and the Latin Americans would have minted all the money, like they are doing now by selling their bauxite to the world market. So it's time that we rise to the occasion to do whatever it takes for the economic strengthening of the state through utilisation of the valuable mineral resources in a sensible way.

Unconfirmed sources indicate that some major alumina producers of the world are funding NGOs in Orissa to prevent setting up of new refineries to continue their monopoly in the market. There must be large scale awareness campaign among our locals so that they can expose these unscrupulous D.

Let us make our Mining Plans, Forest Diversion Proposals (DRP), Environmental Impact Assessments (EIA) and Environment Management Plans (EMP) proper and accountable. A number of environmental impacts can be effectively countered by following the statutory regulations.

It's time to face the reality. When mining areas of the state constitute about less than 0.01% of the total landmass, it can never threaten to pollute the entire biosphere. (Debates on the matter are

acceptable. Please mail comments to: shubhransu@hotmail.com)

OGSA NEWS

Promotion and Posting

- B C Patnaik, JDG (L-I) was promoted to the post of Director Geology on 28.06.10.
- S K Das, JDG (L-I) was promoted to the post of Director Geology on 01.07.10.
- M Patnaik, JDG (L-II) was promoted to the post of JDG (L-I) and posted at Bhubaneswar on 15.12.09
- T Panda, JDG (L-II) was promoted to the post of JDG (L-I) and posted at Bhubaneswar on 20.08.10
- P K Ojha, JDG (L-II) was promoted to the post of JDG (L-I) and posted at Bhubaneswar on 27.08.10

Retirement

- B N Bhol, JDG (L-II) retired on 31.05.2010 on superannuation.

Training and Workshop

- R K Mohanta, DDG attended an advanced course on Mineral Exploration organized by GSI from 25.08.09 to 13.09.09 at Zawar, Rajasthan.
- SK Padhi, DDG & PC Mishra, Geologist attended workshop cum training programme on United Nations Framework Classification (UNFC) for reserve estimation at Nagpur on 15th and 16th December, 2009
- S K Padhi, DDG, K Patnaik, N Sahoo, P C Mishra and K D Nath, Geologists; P K Chand, Petrologist, attended the IBM sponsored training programme on United Nations Framework Classification (UNFC) on 28.01.10 & 29.01.10
- A B Mishra, DDG, P C Mishra, K D Nath, and R Das, Geologists attended "National Seminar on Geoscience for Society & Environment" at Utkal University, Bhubaneswar on 21.02.10.
- T Mohanta, DDG, K C Mohapatra, DDG, K Patnaik, P C Mishra, J P Behera, S Jena, S Mishra, D Sharma, & S A Jena, Geologists attended the advanced training programme on 'Geosoft' at Bhubaneswar from 10 to 14 May 2010.
- N K Mishra & S K Sahoo, Geologists attended a training on 'Geophysical Data Interpretation and Integration' at Regional Training Institute, GSI Kolkata from 10 to 17 July 2010.
- M Patnaik, JDG (L-I), A B Mishra, DDG T Mohanta, DDG, S K Padhi, DDG & N Sahoo, Geologist attended the workshop on 'Geological Education in Secondary Schools' organized by SGAT, at Bhubaneswar on 24.07.10.

Member awarded PhD

- Dr S Sahoo, was awarded PhD by Utkal University, Bhubaneswar on the topic "Mineralogy, Geochemistry and Genesis of Bauxite Plateau in and around Kashipur Block, district Rayagarha, Orissa" on 06.03.2010.