

## NEWS AND NOTES

### Foundation Day of Geological Society of India: Group Discussion on Mining and Environment

– S. V. Srikantia (Email: [svsrikantia@gmail.com](mailto:svsrikantia@gmail.com))

May 28, of every year is celebrated as the Foundation Day of the Geological Society of India, as on this day the Society was formally founded. In conformity with the aims and objectives laid by our founders, the Society organized a Group Discussion on the burning topic of 'Mining and Environment'. The Society invited six experts representing both mining sector and field of earth science - environment to present their view points. Fellows of the Society participated in the discussion within the available time. After a welcome address by the Secretary, Shri R.H. Sawkar, the Vice-President of the Society Shri S.V. Srikantia introduced the topic for discussion.

#### Introduction

Today geologists are in a great dilemma. Exploration for economic minerals is one of their important functions and protection of environment is equally one of their major concerns. We cannot fail in either of these functions. We have a great responsibility to augment all our natural resources for sustainable exploitation which include besides minerals, ground and surface water, soil (its preservation and prevention from erosion), prevention of pollution of water and air, protection of hill slopes, selection of sites for engineering projects like dams and tunnels – all these activities should be carried out on the advise of an experienced geologist without affecting our environment and ecosystem.

Minerals are unique in that they are the result of past geological events which have determined their geographic distribution, and their occurrence is confined to an insignificant fraction of one per cent of the earth's surface. Thus, no nation can expect to be self-sufficient in all minerals. Besides, unlike agriculture and silviculture, minerals yield only a single crop and when once they are utilized they are lost forever and that is why they are considered as the wasting assets of a nation. The prosperity of a nation is dependent upon the availability of mineral

raw materials within its frontiers for manufacturing industries, agriculture, energy which in turn provide all the amenities of the present-day civilization. Mineral resources belong to people of India and the Governments at the Centre and States are the trustees to whom they have entrusted them for exploitation and sustainable development for their maximum good. Have the governments kept up this trust? Are not people disillusioned today?

The concern for the protection of environment of the planet Earth is of comparatively recent origin though it was built into our religious framework in the ancient past when the mountains, lakes, rivers, trees, forests and the lands were considered sacred. Such a belief exists even to this day in the societies of the indigenous people of all continents. Agriculture was the earliest activity affecting our planet's environment as gleaned from the history of Indus - Saraswati Valley civilization and other ancient civilizations in Asia Minor, as agriculture was their main occupation which was not causing much degradation of land as recurrent floods used to bring fresh soil and agriculture was bringing multiple harvests unlike mining of minerals, constituting single crop, was causing permanent scars on the land and permanent loss of natural asset. There cannot be any comparison between these two activities.

The dawn of modern civilizations and the process of industrialization, however, witnessed the advent of mining of minerals on a scale which set in a gradual destruction of land. As the search for minerals transcended into the newly discovered continents and the accidental discoveries of precious metals like gold resulted in unprecedented human migration and destruction of environment leading to profound changes in landscape, extensive degradation of land, loss of precious top soil, destruction of trees, displacement of indigenous population causing extreme

human right violation in newly discovered lands. This glaring reality of the environmental degradation with the consequent economic loss and human right violation of indigenous people stirred up the conscious of the law makers of many western nations to initiate action for environmental protection in all mining districts in their own countries. In India too rules and regulations have been framed for regulating mining, for protection of environment and for reclamation and rehabilitation of mining areas, but the implementation has been extremely tardy leading to all the illegalities in mining with utter disregard of environment and forest. This is more due to the greed of politically supported mining companies to acquire wealth in the shortest possible time to the utter disregard of the environment and the welfare of present and future generation without much thought to conservation and sustainable development of these wasting assets. According to recently released report titled 'Out of Control: Mining, Regulatory Failure and Human Rights in India' by 'Human Right Watch' (2012) "*India's mining industry is an increasingly important part of the economy, employing hundreds of thousands of people and contributing to broader economic growth. But mining can be extraordinarily harmful and destructive if not properly regulated – as underscored by a long list of abuses and disasters around the world. And because of a dangerous mix of bad policies, weak institutions, and corruption, government oversight and regulation of India's mining industry is largely ineffectual. The result is chaos.*" This report is a damning indictment of the existing disastrous situation in the mining industry of India in general and of Karnataka and Goa in particular.

It must be stated that in some cases environmentalists have shown negative propensity towards exploitation of natural resources. If they raise objection to every developmental activity then how are we to

progress. We have become camp followers of countries who are far advanced in technology, have acquired economic control over natural resources outside their national boundaries and not prepared to forego their luxuries in their own countries a wee bit after destroying the natural resources of their colonies and the less developed African and Latin American countries which again are victims of the greed and deceit of many multinational companies. We, in India, have to carve out our own path. *"The country is blessed with fairly adequate reserves of iron ore, manganese ore, bauxite and chromite. Even here, instead of exploiting these to our advantage, emphasis has been more on exporting some of these ores in the raw state for nominal prices. At the same time we are importing finished steel and ferro-alloys by paying in foreign exchange an amount far in excess of the amount earned through export of raw ore."* (Radhakrishna, Dec.1971). 40 years down the line things have not improved rather have deteriorated. By indiscriminate mining of high grade iron ore, throwing to wind the elementary principles of conservation, India is reaching a stage of importing iron ore for our steel industry. The captains of steel industry are crying for a halt to this export of iron ore. The coal mining is equally in a great mess where the public sector Coal India Ltd (CIL) is unable to free the industry from the clutches of the deeply entrenched coal mafia. The recent collapse of the tender process by CIL for appointing a consultant to study illegal mining activities is a testimony to the power of extra-constitutional authorities over coal mining industry. It is time mining is based on strict rules and regulations under a vigilant regulatory authority to check illegal mining. Application of technology should be increasingly resorted to get the best results. Much of the damage to the environment could have been mitigated if the state and central agencies, entrusted with the task of enforcement of mining regulations, had implemented rules pertaining to mining, conservation, restoration and rehabilitation of mine-site areas without political interference. It is time to ponder what we should do to restore the environment and conserve natural resources for larger good of our present and future generation of

people. In the final analysis we have to strike a balance between development and environment for the larger good of the people living around the mining area.

#### Panelists

**M.H.R. Rao (Former Tech. Director, BGML):** India is endowed with reasonably good mineral resources spread over different parts of the country. It produces as many as 90 minerals from over 3000 mines and in spite of this India's ranking in world production is very low.

In India the GDP from mining sector is less than 3% and the major share, however, is accounted for fossil minerals. The Government though encourages both domestic and foreign investments in mining sector, 20 years down the line there is no change and the policy remains dormant. The root cause appears to be total apathy and insensitivity of the successive governments to the needs and progress of the nation and also well being of the people. As a result illegal mining sprouted causing destruction of environment. This is a picture in contrast to the situation in the State of Mysore a century ago when the contribution from mining industry was 25% of its annual budget.

It is a sheer coincidence that most of the mineral deposits are located either in forest areas or close to backward tribal areas. Mineral deposits are to be exploited where they are located. Mining, however, is discouraged in forest areas, near national parks, wild life, game and bird sanctuaries, biosphere reserves, wet lands, in coastal regulation zones, near important archeological sites, places of tourist attractions, hills and beach resorts, coastal areas rich in corals, natural lakes and swamps, airports, defence installations, in important watersheds, tribal settlements, mangroves, migratory and corridor routes of birds. Where else can we mine except where there are minerals? It is not disputed that environment and its protection is important. Natural environment is man's most precious heritage and there ought to be concern for its protection. Mining is one industry most discredited as environmentally unfriendly, but mining industry has made positive efforts to restore balance with nature. Adoption of cleaner and

efficient technologies would result in conservation of resources, utilization of marginal grade ores, less damage to environment and promote restoration of environment by proper landscaping. The time has come for professional bodies to seriously take up with concerned authorities to evolve a transparent system to restore the reputation of the mining industry.

**D.V. Pichamuthu (Past President, Federation of Indian Mineral Industries):** Illegal mining flourished due to poor governance as pointed out by the Ministry of Mines, Govt. of India, and also due to infirmities in the grant of leases. The lease granting authorities resorted to unscientific and irrational ways in the grant of leases without thought to minimum size of lease area for scientific mining and dumping of waste. The lease sketches in many cases were not tied to coordinates of Survey of India toposheets or to any permanent benchmarks. This factor alone led to many irregularities subsequently. This led to the appointment of CEC by the Supreme Court of India to look into the above aspects. After going through the reports of CEC the Supreme Court directed the Indian Council of Forestry Research & Education (ICFRE) to prepare macro – EIA Plans for Bellary, Chitradurga and Tumkur districts. The task of preparing individual R & R plans has been entrusted to the Federation of Indian Mineral Industries (FIMI) and ICFRE which would be finally approved by the CEC. After those overall plans will be prepared for the entire Mining Impact Zone into which the individual mine plans would be dovetailed. The CEC has divided the mines into categories A, B & C depending on the severity of environmental damage. The preparation of R & R plans have been prioritized and A category of mines of over 50 ha. are being taken up first. This will be followed by the B category of mines of over 50 ha, other mines of A & B categories and finally category C mines.

In future due to many restrictions that will be imposed, it is apprehended that many leases will become non-functional. Even in case of leases which will be permitted to operate, the production can only start after rectification and at a level lower than earlier. Some leases may have to be amalgamated

and in fact FIMI has recommended the same in some specific cases. Exploration will be accorded the status and importance it deserves and drilling companies will be in much demand. Mining will become more scientific and sustainable. Environment will improve.

The Geological Society of India can play an important role by dissemination of information on mineral resources and its scientific exploitation within the parameters laid down by the Ministry of Environment and Forestry. The Society can take up the issue of expeditious clearance of applications for mineral concessions within a time frame and finally a geo-scientific platform should be set to keep up a continuous dialogue between the Government, the industry and various other stake holders.

**N.R. Ramesh (Dy. Director General, Geological Survey of India):** India is endowed with a variety of large mineral deposits which are occurring in many geologically favorable provinces of the country. Minerals and ores have been exploited since Prehistoric times. However, rapid pace of industrialization of the country in the 20th century and the concomitant exponential growth of population, coupled with liberalization and globalization along with spurt in Indian economy, have all culminated into higher demand - growth trajectory and accelerated the rate of consumption of minerals and metals for indigenous use and export. Mining is an important socio-economic activity by which many varieties of minerals and other geological materials are exploited by the mankind from surface to shallow subsurface of the earth's crust. It is a growing industry in India feeding the raw materials to many manufacturing sectors and contributing to the country's GDP.

The Indian mining industry is poised for a rapid growth with the likely infusion of heavy capital investments, state-of-the-art technology and equipment. However, due to non compliance of the best practices in some areas, mining has caused destabilization of the landscape and degraded the natural environment by way of adversely altering the land use/cover, contaminating natural water sources and the

air, thus jeopardizing the health and social well being of the local inhabitants. Encroachment of fertile wet lands and forest areas for mining or allied activities in some cases has threatened the wild life and biodiversity and has put pressure on food and water security of the populace living in the neighbourhood of the mining belts. Realizing the emergent situation, Govt. of India has framed sustainable development policy (Anwar-ul-Hoda Committee- 2005) by envisaging measures and policies (NMP-2008) factoring in social issues, broadly consistent with global trends and monitored through a regulatory mechanism, so that sustainable development in the mining sector in India is achieved, while maintaining inclusive growth and social harmony among the local population.

**R.K. Somashekar, (Chairman, Dept. of Environmental Science, Bangalore University, Bangalore):** Mining is an important economic activity in India which contributes significantly to its economy. The country exports a variety of minerals found in abundance in its geographically diverse region. Mining is preceded by geological investigations that locate the deposit and, economic analysis that prove its financial viability.

Several questions have to be answered from the point of view of Sustainable Mining. Is mining inherently inconsistent with sustainable development? Does it mean different things to different people? Does it mean something different in developed than in underdeveloped countries? Is it site specific? Is it a process or a product? Is it possible to have sustainable development without mining? Are the present generations meeting their needs without compromising the ability of future generations to meet their needs?

It implies that the future generations have rights over resources and the present generation has a duty to include future generations' needs in its decision-making. An accounting of social and environmental impacts of mining has to be taken. The next question is who makes the call - Government, industry or the free market? Economic responsibility lies with shareholders, employees, community and society. Environmental responsibility

should rest with society as it is more concerned with mining's impacts and behavior than its product. Resource stewardship should be wise and efficient. There has to be Community Engagement with shared objectives and finally the product stewardship which calls for social license and public accountability as *we mine with the consent of the public*.

For achieving sustainable development, it requires planning and cooperation and the following draft principles have to be kept in mind:

- Ensure that health, safety and environmental protection, together with community values, are addressed in business plans and decision-making processes for exploration, mine development, operating procedures, and reclamation and closure activities.
- Identify and enhance economic and social sustainable development opportunities in surrounding communities by engaging community stakeholders throughout the entire life cycle of the mining operation, and beyond, as active participants in the formulation of fundamental standards upon which sustainable development is founded.
- Strive to maximize the sustainable development benefits and mitigate the impacts of mining activities on the economic, environmental and social needs of the surrounding communities.
- Support education and research pertaining to the most effective and efficient ways in which mining can, and does, contribute to sustainable development.

**M.L. Patil (Executive Director, The Hutti Gold Mines Company Ltd.):** The Hutti Gold Mines Company Limited (HGML), the only profit making gold mining company in India, is environmentally conscious and committed to achieve its business goals through sustainable development / growth. The Corporate Environmental Policy of HGML also emphasizes on "*conducting our operations in an environmentally correct manner, complying with applicable regulations and striving to go beyond*". HGML recognizes its responsibility to

continuously improve its energy efficiency and optimize resource consumption through various measures viz. improvement in process technology by adopting the “3R” principle-Reduce Recover and Recycle. Cleaner technology is being practiced in the process by complete detoxification of the process waste by adopting recovery system which reduce the chemical consumption and complete recycling of the water to form a zero discharge thereby significantly reducing the amount of hazardous substance (Cyanide) escaping to the environment, recover utilization by recirculation of the process water, which play a significant role in achieving the environment standards prescribed by KSPCB, which is continuously monitored by regulating authorities. HGML has been a pioneer in terms of environment management and in adoption of advanced eco-friendly cleaner technologies. The effective pollution abatement strategies are expected to satisfy the environment friendly, safe, technique in processing of gold ore.

As we are doing underground mining the dust generated due to mining is minimal and the dust generated during processing is managed by adopting dust collectors and bag filters and scrubbers. Post filling the stoped out areas are introduced as a safety measure to avoid the stress and subsidence. Adoption of efficient ventilation in underground mine is also essential. Production and ventilation are interdependent. Healthy working conditions are made possible to eliminate occupational hazards like blockage of lungs, silicosis etc. Safety and health of workers were given utmost importance.

Even at opencast operation at Uti Gold Mine of HGML in Deodurga Taluk, Raichur District, eco-friendly mining is introduced. When surface and near surface deposits are exhausted it is inevitable to go for underground mining. However, it is felt that surface mining has better advantage than the underground mining in respect of safety and cost of production.

Underground mining is generally done below water table in the humid and semi-arid regions and Hutti Mine is no exception. Exploitation of enormous amount of ore and the overburden in the region may disturb

the local groundwater regime. A “Comprehensive Hydrological Study” has been carried out with an aim at finding the magnitude of impact on water resources at large due to mining and to suggest possible remedial measures for affected areas if any. The nature and characteristics of aquifers and groundwater occurrence have been investigated; groundwater balance and stage of groundwater development have been estimated. The impacts of mine dewatering on local groundwater levels, open wells, groundwater recharges, groundwater flows etc. have been assessed using the field data. Based on the analytical groundwater equations, the radius of influence due to mine dewatering around the lease area has been estimated. Groundwater quality data has been analyzed and the suitability of these waters has been studied. The Hutti Gold Mine has reached to a depth of 850 m and no water seepage has been observed at deeper levels, since it is a dry mine. The study shows that areas of drinking water stress and water scarcity are not seen in the immediate neighborhood of the present mine lease. Further, any proposed expansion plans propose to meet its water requirements from the main Krishna river and hence no additional stress is imposed on the groundwater environment.

The HGML is pursuing an active afforestation programme for 2012-13 which is being undertaken in co-ordination with Karnataka State Forest Department and Karnataka State Bio Fuel Development Board (KSBDDB). The HGML has also undertaken an awareness programme being conducted by the environmental engineer for children in Schools / College regarding the environment concepts, viz., conservation of natural resources, solid waste management, rain water harvesting and afforestation.

**C.M. Reddy (Bangalore):** The fundamental thought of common man is why there is so much of mining. For a modern man to live comfortably, the essential things required are food, healthcare, shelter, clothing and transportation. Greed has driven man to change his lifestyle drastically which forces him to overexploit the earth for its natural resources – water, oil, minerals and coal. Is

our current building construction technologies and materials, the right ones? Can we build sustainable homes using locally available material with less cement and iron?

E.F. Schumacher, noted economist, in his book, “*Small is Beautiful*” says Westerners’ fascination towards growth, economics of scale, metropolis and misunderstanding of natural resources as income rather than capital for future use, are the root causes of exploitation of natural resources. Though this was written in 70s on Western Economy, it sounds very relevant for today’s India. Globalization and liberalization might have helped India tide over many economic challenges, but isn’t it also making greedy corporates exploit natural resources for quick financial profits. Are local people benefiting from the Mining? Is there any department in the government estimating the magnitude of the minerals required for Indian population to lead a comfortable and respectable life? Can the licenses be given based on this rather than mine-as-much-as-possible to flaunt high GDP? However, there are corporates who are socially responsible and they focus on providing health and education in the backward regions for the under-privileged. Nonetheless, reviving the environment is low on their radar as they are more focused on building human capital for their growth. Can Indian corporates and more so mining related companies, take initiatives to revive the ecology and environment?

Mining and transportation of ore are causing great damage to forests, the farmlands around the mines as well as on the roads to the ports or to processing plants. Besides, factors like global warming, excessive use of fertilizers and pesticides, and ecologically damaging large irrigation dams have made large tracts of agricultural land unfit for farming. The recently initiated phenomenon of SEZs (Special Economic Zones) and bio-fuel cultivation have only reduced the land available for growing food. Mining is a necessary economic activity, but how much to be allowed? There has to be a balance between preservation and consumptions.

The Geological Society of India can create awareness in the governmental circle to strictly implement environment



restoration activities so as to build this in all mining leases. The Society should also interact with corporates for adoption of scientific method of mining that causes least damage to environment.

### Participants in Discussion

**H. Chandrashekhar (Formerly, Dept. of Mines and Geology, Bangalore):** The Government of India (GOI) has formulated about 13 Acts and Rules related to the Mines and Minerals of this country. Among them the Mines and Minerals Regulation Act (MMRD Act 1957) and the Mineral Concession Rules 1960 (M.C. Rules 1960) are the most important Act and Rules for the sanction and the control of mining activities in the country. State Government is the authority to operate these Act and Rules framed by the GOI for sanctioning a Mining Lease (M.L.). State government has to obtain prior approval from GOI in respect of Scheduled Minerals, and iron ore is one among such minerals. This means both State Government and GOI are responsible directly and indirectly in controlling and administrating the mining activities in a State.

In the year 1990 GOI adopted the Policy of liberalization to attract F.D.I. This could have been alright excepting for the Natural Resources. But the M.M.R.D. Act 1957 has been changed as the 'Mines and Minerals Development and Regulation Act 1957' (M.M.D.R. Act 1957). Several changes introduced in the Act have reduced the control of the State over the exploitation of 'Natural Resources'. Till August 1992, the GOI owned company "Minerals and Metal Trading Corporation" (MMTC) was the sole Agency to import or export of Minerals or Metals. This company was professionally managed and offered beneficial prices for the minerals to the authorized M.L.holders, considering the prevailing international market price. The MMTC was buying ores or minerals only from ML holders and not from any trader. The ores were transported only by rail to the respective harbours for the export purposes. The purchase of ores was limited to the geological permit issued by the State Dept., only after the receipt of suitable royalty as specified in Act 1957. No trader or intermediary was in the picture

at all. Thus, there was no scope for illegal mining nor there was any loss of royalty.

But in Aug. 1992, the GOI allowed the direct export of iron ore of less than 62% Fe content. This was a death blow on the MMTC and opened the flood gates for illegal activities. Iron ore, in the guise of less than 62% Fe was exported recklessly. Since the role of MMTC was reduced to naught, illegal mining operations mushroomed. Persons or agencies without any ML started exporting iron ores especially to China. This led to the depletion of our resources.

During 1988-89 or so the total production and export of iron ore (of all grades) in Bellary dist was around 4.5 million tonnes. But this figure jumped to about 45 million tonnes by about 2000. It is estimated that actually the quantity of iron ore exported was about 65 to 70 million tonnes. If this trend is not reversed, we may exhaust all our valuable iron ore reserves within a few decades and we will be left with huge pits scarring the greenery of the countryside. This can be achieved if the GOI restores the role of MMTC to the status prior to 1992, and the iron ore or any mineral should be transported by rail only, with valid permits issued by the State D.M.G. after the receipt of advance royalty. These suggestions can save the State in particular and the country in general from the loss of our natural resources.

**K.C.B.Raju (Formerly Central Ground Water Board):** Groundwater is a natural 'mineral' resource which is renewable annually. If its extraction exceeds the annual recharge in a given area, it is termed as over exploitation. The effect of this is not visible on the earth's surface unlike other mining activities but its effect is colossal on the environment affecting both faunal and floral kingdom. Initially the effect can be seen in declining of water levels, reduction in yield of wells, shallow wells going dry affecting the availability of water for domestic, agriculture and industrial needs. The declining of water levels at rapid rate annually necessitates deepening of wells to tap the deeper aquifers with high cost, resulting in increase in energy consumption to lift water from great depths. This results in deterioration of

ground water quality with increase in its chemical constituents with depth in the hinterland and sea water ingress into the coastal aquifers causing millions of hectares of fertile agricultural land uncultivable leading to desertification, thus threatening the agricultural economy of millions of poor farmers triggering their migration to other places in search of livelihood. Thus the total threat to environment, human life, agriculture and economy is much more in groundwater mining. Even other mining activities where water levels have to be depressed to extract coal and other minerals lead to mining of ground water causing ill-effects as earlier stated.

Therefore, it is very essential and urgent to estimate the groundwater availability in each river basin accurately based on hydrogeological, hydro-metrological, hydrological and agro-metrological basis to determine the quantity and quality of ground water available in the aquifers down to the depth of economic feasibility for its optimum development and judicious management for its sustainability.

**K.R.Y. Simha (Professor, Dept. of Mechanical Engineering, Indian Institute of Science, Bangalore):** Various strategies have been forcefully expressed for evolving and promoting a sustainable mining policy to ensure social, economical and environmental welfare of all the stakeholders involved. While there was a general discussion about sound mining practices from geological, environmental and earth-science viewpoints there were no specific recommendations on *Engineering* and *Technology* aspects to formulate a specific agenda for a specific geological problem for a specific mine. This is understandable considering the speakers' academic and professional experience.

Rapid strides in mining engineering and technology have contributed greatly to global wealth while ensuring safety and welfare for the community. I suggest to involve and invite technology providers to participate in future events to address the concerns raised by the experts as well as the participants during this meeting. I do believe that all genuine societal concerns have technological solutions, and we do have several stellar examples in

construction, mining and tunneling for irrigation, power and transportation.

In this context, it would be useful for the Society to join hands with mining schools, bureaux and R&D labs such as NIRM, Kolar. These general observations would provide an idea as to how great a need exists for strengthening the ties binding mining science, engineering and technology.

**S.N.Guru Rau (Formerly Chief Engineer, CWC):** In activities like design and execution of dams for water resources, the work initially is akin to mining with impact on environment. This work needs input from geology, soil mechanics, rock mechanics and environmental impact assessment. The construction of dams and canals, particularly in the Himalayan terrain, has caused change in the regime of rivers, and the post-monsoon flows onto the land has imperceptibly raised it due to fine silting of the bed. This has caused increase in the flood plains. The increase in irrigation downstream has caused increase in water logging and salinity in head reaches in the conveyance system. The surface runoff has increased the floodplain intensity.

In the case of the Western Ghats the impact of environment has been neglected. While designing KIOCL dam, a clear direction was given to take care of heavy rainfall from upper reaches. Arrangement was also made to divert silt; yet the significance and importance of environmental impact of heavy rains from high hills was taken lightly and considerable damage took place during execution. Later

it was designed to allow sediments to pass through a tunnel to the sea. This seems to have worked well. Later it was applied successfully in the NALCO's tailing dams in Orissa. It is mandatory to make in-depth study and evaluation.

### Conclusion

The interaction among panelists, other participants and Fellows of the Society brought a broad consensus on the need for scientific exploitation of minerals. This should start with transparency and expeditious issue of mining license to persons with sufficient capital and requisite experience. The issue of mineral concession system should be rationalized and should be on on-line basis. Proxy application should be discouraged. There should be strict vigilance over any illegal mining activity to nip it in the bud. Creation of a regulatory authority regarding strict environmental protection and preservation of eco-system and enforcement of mining regulations is necessary. Export of minerals should be discouraged and it should not be allowed without the permission of a professional body like Mineral and Metal Trading Corporation. Value added products from minerals should be encouraged. Mining activity in some cases, having no regard to the local terrain conditions and safety measures, has assumed socially unacceptable dimensions and has negatively impacted the fragile ecosystems causing many social conflicts and misery to local population. The people of India deserve a better deal and greater benefit from the minerals mined in their area which can be

utilized for development and growth. Restoration and rehabilitation should be the sole responsibility of the mining companies at their own cost. The time has come for professional bodies to seriously take up with concerned authorities to evolve a transparent system to restore the reputation of the much maligned mining industry. Mining should be scientific and sustainable. Every mining activity should obtain strict Environmental Impact Assessment (EIA) clearance by an independent agency verified by professional body. Any deviation from the EIA plan should be seriously dealt with. An auditing of social and environmental impacts of mining has to be carried out. The corporate sector should be made accountable with regard to their mining activity, environmental impact and social responsibility. The increasing application of modern technology in mining should be examined. The Geological Society of India can play an important role by dissemination of information on mineral resources and its scientific exploitation within the parameters laid down by the Ministry of Mines and Ministry of Environment and Forestry. The Geological Society of India can create awareness in the governmental circle to strictly implement environmental restoration activities so as to build this clause in all mining leases. The royalty on minerals should be based on mining cost accountancy and the major share of this revenue should be utilized for the development of the mining district, where the minerals are mined for the benefit of the people of the area.

### ANNOUNCEMENT

#### NATIONAL WORKSHOP ON DISASTER MANAGEMENT IN INDIA

The Department of Civil Engineering at REVA Institute of Technology and Management, Yelahanka, Bangalore - 560 064 and the Geological Society of India, Bangalore are jointly organizing the above workshop during 6-7 November 2012 at the REVA Institute of Technology and Management. For further details, please contact: Dr. Y. Ramaling Reddy, Prof. and Head, Department of Civil Engineering, REVA, ITM. **Phone:** 94485 08996; **Email:** ramalingreddy@revainstitution.org or Prof. V. Jayarama Reddy, Assoc. Prof. Department of Civil Engineering, REVA ITM. **Phone:** 96119 51569; **Email:** jayaramareddy@revainstitution.org