# 17<sup>th</sup> Convention of Indian Geological Congress and International Conference on New Paradigms of Exploration and Sustainable Mineral Development : Vision 2050

## (NPESMD 2011)

November 10-12, 2011

*Editors* O. P. Varma B. C. Sarkar A. K. Varma M. K. Mukherjee Sahendra Singh

Organised by :



**Department of Applied Geology** Indian School of Mines, Dhanbad

Jointly in association with



Indian Geological Congress Roorkee

### Proceedings

17<sup>th</sup> Convention of Indian Geological Congress and International Conference on New Paradigms of Exploration and Sustainable Mineral Development : Vision 2050 (NPESMD 2011)

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at Indian School of Mines, Dhanbad

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# PREFACE

Mineral and energy resources are the ingredients of nearly all products that mankind use everyday. These resources must go through a stages or processes before usable products can be generated. Expansion of our reserves and resource base through exploration is a part of our sustainable growth strategy. The rapid economic growth of India is faced with increasing challenges from the raw materials, energy and power sectors. With the growing need for rapid expansion in infrastructure development and GDP growth, the necessity of minerals, metals, hydrocarbons and power has become larger than ever. Over the present decade tremendous advancements have been made in the fields of mineral exploration and developments worldwide in terms of understanding mineral deposits in relationship to external and internal processes of the earth, exploration techniques, instrumentation, sustainable development and framing of mineral policies. Phenomenal developments have similarly been achieved in the hydrocarbon industry, to the effect of improved production, new findings of oil and gas reserves and a better understanding of petroleum systems. Consumption of water has also increased many folds to meet the demand of agricultural and industrial production.

It is in this context, the Department of Applied Geology, Indian School of Mines, Dhanbad in association with Indian Geological Congress, Roorkee, is jointly organising the **17**<sup>th</sup> Convention of Indian Geological Congress and International Conference on 'New Paradigms of Exploration and Sustainable Mineral Development : Vision 2050 (NPESMD 2011) at Indian School of Mines, Dhanbad from 10<sup>th</sup> to 12<sup>th</sup> November 2011 with the primary aim to focus on issues related to our country's growing needs of minerals, raw materials, energy and power and also to foster a strong cooperation among industry, academia and research institutions. The convention will also deliberate on conservation of raw material resources and environmental safeguards to enhance the quality of life and fostering innovation.

In all, the conference proceedings consist of a plenary session and eleven technical sessions with 87 papers including keynote addresses and contributory papers. We thankfully acknowledge all the contributors without whom this event would not have been a success. The contribution of various committees under the Chief Patronship of Shri P. K. Lahiri, IAS (Retd.), Chairman, ISM Executive Board and General Council and Patronship of Shri N. M. Borah, President, IGC and Chairman & Managing Director, Oil India Limited and Prof. D.C. Panigrahi, Director, Indian School of Mines is greatly acknowledged. The editors thankfully acknowledge with a deep sense of gratitude all the sponsors and co-sponsors for their generous support in organising the Congress-cum-International conference.

O. P. Varma B. C. Sarkar A. K. Varma M. K. Mukherjee Sahendra Singh

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