

organizations to achieve the goal of making the environment of Bangalore much better than it is today

As it is rightly said that 'the first thing in waste management is to stop calling waste as waste' A rethinking is called for so that waste becomes wealth, refuse becomes resource and trash becomes cash Policy and science of waste reduction and management initiatives are required at home,

in schools, offices, small and large businesses, local governments and public institutions

*Karnataka State Remote Sensing Applications Center*  
*Bangalore - 560 034*  
*Email: talaneru@yahoo co in*

## SILVER JUBILEE SEMINAR ON "ANTARCTIC SCIENCE: INDIAN CONTRIBUTIONS IN GLOBAL PERSPECTIVES" AT GOA

Commemorating the silver jubilee year (2006) of India's Antarctic Programmes, the National Centre for Antarctic and Ocean Research organized a two day seminar on "Antarctic Science Indian Contributions in Global perspectives" at Goa during May 25-26, 2006 The Seminar was inaugurated on May 25, 2006 by the Chief Minister of Goa, Shri Pratap Singh Rane in the august presence of Dr S Z Qasim, Former Member of Planning Commission and the Leader of the first Indian Antarctic

Expedition, Dr U R Rao, Former Chairman Space Commission and a renowned space scientist and Dr P S Goel, Secretary to the Government of India at Ministry of Ocean Development This seminar was attended by more than 100 leading polar scientists across the country During these two days deliberations a total of 24 research papers were presented orally while 17 papers were presented through posters under the following broad themes

- Investigations of Lower, middle and upper Atmosphere with special emphasis on various processes and phenomenon occurring over Antarctic region
- Geological, glaciological, geophysical and limnological hydrographical investigations over Antarctica
- Investigations on bacteria and microbes, their adaptation to extreme cold climates and exploration/ exploitation of their biotechnological potentials
- Detailed Investigations of the physiological and psychological behavior of expedition members under acute stress conditions on a long term basis
- Studies on the application of non-conventional energy sources
- Development of cold region technologies
- Paleoclimatic reconstructions using various proxies like ice cores, lake sediments etc
- Satellite remote sensing and airborne surveys in Antarctica

Many invited lectures by eminent scientist were also delivered covering major issues of not only polar science and technology but polar logistics as well The exchange of ideas and opinion amongst participating polar researchers in this seminar widened our knowledge on various aspects of Antarctic Science

In the concluding session of the seminar an Expert Group Panel under the Chairmanship of Dr S Z Qasim, discussed the outcome of the Seminar and deliberated on the future polar science programme in Antarctica from Indian point of view Chairman of the session invited the chair and the co-chair of various technical sessions for summing up of their respective sessions and declared the session open for discussions The experts opined that the Antarctic research should be on at par with international standards and were emphatic that multi-institutional and multi-disciplinary research has to be given its due importance in Antarctic region

The salient observations and recommendations of this seminar are briefly summarised below

- the need for absolute dates on rocks, sediments and ice cores the lack of which was affecting the Indian Polar science was deeply emphasized
- the scientific objectives of the participating organizations need to be more focused and long term
- the need for collaboration between participating organizations and even outside country was realized so that the samples/data is not lost for the limitations of the collecting agencies
- there is a need for summarizing the results/outcome of the research as a measure of achievements
- cost benefit analysis viz-a-via money spent on the polar sciences and the outcome needs to be evaluated
- the importance of creative science commensurate to the money spent was realized

- emphasis was laid on improving the standard of science and greater visibility through international publications, collaboration and more focused approach
- suggestion was made for expansion of data collection points at more than one station where simulations and continuous recording of data is made for greater reliability and accuracy of information Indian initiative for setting up of another station will greatly benefit in developing the weather modeling parameters
- establishing parallel data banks at different places should be avoided
- standardization of format for data on all the aspects of polar science was suggested It was strongly felt that important quality data should be posted on the web for greater visibility and better knowledge sharing
- long term secular changes in terms of time and space for sea ice /land ice over Antarctic region need to be monitored
- the vital aspect of capacity building in polar science and technology should be encouraged
- MOU's between participating organizations must be evolved to strengthen the mutual collaborations and multi-disciplinary research
- students' participation in Indian Antarctic programme must be increased
- silver jubilee research fellowships should be introduced for greater commitment of students
- statistical analysis of biological data and the evaluation of the functional aspects of microbes in all relevant studies need to be undertaken
- in order to understand the climate in a better way, the correlation of behavior of Antarctic glaciers with that of Himalaya must be attempted
- Indian satellite to have foot prints over Antarctica for online data transfer and improved communication was recommended
- quantification of results to judge the effectiveness of individual scientists may be attempted
- online transmission of data to have immediate global visibility must be initiated

As a follow-up, actions are being taken up to meet the aforesaid recommendations It is hoped that Indian Antarctic Programme will emerge on par with other International programmes in the global perspective This seminar was yet another milestone and occasion to contribute to the year long celebrations of International Polar Year (IPY) and Silver Jubilee of the Indian Antarctic Programme

*National Centre for Antarctic and  
Ocean Research  
Headland Sada, Vasco-da-Gama,  
Goa - 403 804  
Email: nkhare@ncaor.org*

N KHARE

## COAL BED METHANE (CBM) POTENTIAL IN INDIA: CURRENT STATUS

Natural gas has experienced the fastest rate of increase in India's primary energy supply It meets about 7% of India's energy and its share is expected to double by 2020 Power generation, fertilizers and petrochemical industries have been turning to natural gas as an energy feedstock India's natural gas consumption has been met entirely through domestic production in the past However, demand for natural gas since the past 4-5 years has been so rapid that the demand far exceeds the supply To bridge this gap, public and private sector companies are pursuing several gas import options The India Hydrocarbon Vision 2025 has identified natural gas as the fuel for the future

With the introduction of the New Exploration Licensing Policy by the Government of India, the pace and quality of exploration for hydrocarbons has accelerated This has resulted in significant oil and gas discoveries in recent years in the offshore and on land sedimentary basins of India including deepwaters of the east coast of India There has

been substantial accretion of oil and gas reserves as a consequence of these discoveries In addition to the conventional fossil fuel sources, some of the other non-conventional options for gas include coal bed methane (CBM), gas hydrates, gas shales, tight reservoirs, basin centered gas, gas in high pressure aquifers Of these CBM and gas hydrates have received increasing attention in recent times in India

One of the most important fossil fuel resources which is of immediate commercial interest to us is CBM India, having the sixth largest proven coal reserves and being the third largest coal producer in the world, holds significant prospects for commercial recovery of CBM The bulk of the coal resources of around 250 billion tones are contained in older basins Substantial lignite deposits also occur in younger basins of Gujarat, Rajasthan and Tamil Nadu These coal and lignite deposits contain varying amount of CBM depending on the rank of the coal, depth of burial