

**INTERNATIONAL WORKSHOP ON
REMOTE SENSING FOR MINERAL AND GROUND WATER EXPLORATION,
NATIONAL REMOTE SENSING AGENCY, HYDERABAD (INDIA), OCTOBER 22 - 28, 1998**

PARTICIPATING COUNTRIES: 12 (INCLUDING 9 MEMBER COUNTRIES OF THE NAM S&T CENTRE)

NUMBER OF PARTICIPANTS: 15

The economic development of a country largely depends on its mineral wealth. The increasing demands of minerals by the society due to the exponential increase in population and industrialisation emphasize the need for replenishing depleting reserves by locating new mineral deposits. Hence a planned mineral exploration programme is required for a steady growth of a country. The remote sensing technology has provided a boost to mineral exploration studies, particularly with the availability of high-resolution satellite data from Indian Remote Sensing Satellite IRS-1D, which helps in understanding the regional geology and lineament tectonics. The visual and digital interpretation of various remotely sensed data give detailed geological information of mineral indicators like specific rock types and geological structures, such as faults, fractures, lineaments, arched or domed strata, etc. Similarly, another important need for the society is the ground water. Ground water may be considered as one of the most precious and widely distributed resources on earth. Unlike the other mineral resources, it gets replenished every year from the precipitation through natural recharge. Water is one of the most essential requirements for the survival of mankind for domestic, industrial and agricultural purposes. High-resolution satellite data can be used effectively for locating the potential ground water zones.

With this background in mind and the importance of the remote sensing technology in the field of mineral and ground water exploration, an international workshop on Remote Sensing for Mineral and Ground Water Exploration was conducted by the National Remote Sensing Agency (NRSA) of the Department of Space, Government of India at Hyderabad, India during October 22 - 28, 1998 with the support of the NAM S&T Centre, Asian and Pacific Centre for Transfer of Technology (APCTT) and National Geophysical Research Institute (NGRI), Hyderabad were involved in the workshop programme.

15 participants, one each from Bangladesh (Mr. Md. Atair Rahman of Bangladesh Space Research & Remote Sensing Organisation, Dhaka), Egypt (Dr. Elsayed Abbas Zaghloul of the National Authority for Remote Sensing and Space Sciences, Cairo), Indonesia (Mr. Dwi Nowo Martono of the National Institute of Aeronautics and Space - LAPAN, Jakarta), Iran (Dr. Mohammad Morabby of the Iranian Remote Sensing Centre, Tehran), Malaysia (Mr. Azlikamil bin Napiah of the Malaysian Centre for Remote Sensing, Kuala Lumpur),

Mauritius (Mr. Pokhun Rajeshwar of the Ministry of Public Utilities in Rosehill), Nepal (Mr. Ramesh Man Tuladhar of the Ground Water Resource Development Project in Kathmandu), Philippines (Ms. Isidora Moises Camaya of the Project Development Department in Quezon City), Thailand (Dr. Punya Charusiri of Chulalongkorn University, Bangkok), Vietnam (Dr. Ngo Ngoc Cat of the National Centre for Natural Science and Technology, Hanoi) and Zambia (Dr. Paul Zambezi of the Ministry of Science, Technology & Vocational Training) and four from India (Mr. C. Manoj, Dr. Pramod Kumar, Dr. R. Rajesh Kumar and Mrs. Kushmita Arora of NGRI, Hyderabad) attended the workshop from various developing countries. The nominees of China, Cuba, Iraq, Pakistan and Zimbabwe however could not attend.

The workshop was inaugurated on 22nd October 1998 at NRSA. Dr. A Bhattacharya, Group Head, Geosciences, NRSA welcomed the participants and audience. Dr. Harsh K Gupta, Director, NGRI mentioned that such workshops would lead to take the technology far away among the developing countries as they have several common issues and stressed upon the importance of remote sensing and geophysical studies as a tool for ground water exploration and complemented the Centre for organizing the workshop on this subject. Dr. Hari Narain, Emeritus Scientist gave the inaugural address and stressed the importance of such workshop. Dr. D. P. Rao, Director, NRSA delivered the key note address on 'Remote sensing technology for natural resources surveys particularly in mineral and groundwater.' He stressed that to meet the challenge of systematic resource collection, modern exploration tool and techniques have to be used including usage of remote sensing and aero-magnetic data, software tools and computers, Global Positioning Systems (GPS), Geographic Information System (GIS), and Geostatistics, etc. Remote sensing applications in India cover diverse and key national issues such as agricultural crop average and yield estimation, wasteland management, water resource management, ocean / marine resource survey and management, mineral and ground water potential zone mapping, forest, land use, low core mapping and disaster monitoring including earthquake and flood management. India achieved a major milestone in space technology when it launched a series of operational remote sensing satellites of IRS-I and IRS-P series, the latter ones carrying a unique combination of advanced sensors. The data provides information on different factors controlling mineralisation and thus helps in identifying the favourable areas / target zones for different minerals. Dr. Rao described the use of remote sensing as a tool for exploration of minerals, including diamond, base metal and uranium, gold mineralisation, nickel and chromite, coal and hydrocarbons and for ground water potential zone mapping. Dr. Rao also explained the use of remote sensing for coal mine fire mapping, geo-environmental surveys and earthquake prediction study.

The participants presented their country reports in the Plenary Session regarding the status of remote sensing technology in their individual countries and stressed the requirement of such technology for taking up work in the field of

mineral, ground water and mining exploration. Country papers received from Iraq and Zimbabwe were also circulated. The Plenary Session was followed by technical sessions in which experts in various fields of remote sensing and geophysics from NRSA and NGRI delivered a number of lectures on various subjects like fundamentals of aerial photography and photogrammetry, physics of remote sensing, remote sensing sensors, principles of image interpretation in geological studies, remote sensing for lithological, structural and landform identification, geophysical exploration. A number of case studies were presented on mineral and ground water exploration. Participants were taken to field visit and visit to the Earth Station. In the Valedictory Function Dr. A. Bhattacharya, Group Head, Geosciences, NRSA gave a report on the successful completion of the course followed by remarks on the course by Mr. K. Lakshminarayan of APCTT and Mr. S.K.Bhan of NRSA The participants gave their impressions on the course. In the panel discussion chaired by Dr. Harsh K. Gupta, Director, NGRI mentioned about more collaborative projects and training as per the needs of various countries.