Geochronological Facilities Supported under Earth Sciences Program of Department of Science and Technology – Manoranjan Mohanty, SERC Division, Department of Science and Technology, New Delhi - 110 016. (E-mail: mohantym@nic.in)

The Department of Science and Technology (DST) has been supporting extramural research grants for promotion of research in the country. Earth & Atmospheric Sciences forms an important component of Science and Engineering Research Board (SERB), a statutory body under DST. The other S&T areas being covered include - Engineering Sciences, Physical Sciences, Life Sciences, Mathematical Sciences and Chemical Sciences.

Under the SERB emphasis is given for research promotion in frontier areas of Science and Technology, through extramural funding, facility creation and manpower development.

The Earth Sciences Programme is being implemented through SERB and is guided by a galaxy of experts viz. the Programme Advisory Committee on Earth Sciences. The scope of the programme includes study of Earth and Earth System Processes – it's coupling with the atmosphere & oceans. In this programme, individual R&D proposals attempting to carryout research in frontier areas of earth sciences are supported. Co-ordinated programmes are evolved wherever an integrated approach to understand a problem / phenomena is undertaken.

In the last two decades, use of advanced instruments for generating data in various branches of earth sciences has increased. The advanced geochemical and isotope geochronological facilities are considered as basic requirements and available in many Universities in the developed and developing countries, including China. But in India, the existing facilities are not adequate enough to comply with the demands of the faculty and research scholars, since access to such sophisticated facilities are limited and they are forced to depend on laboratories abroad. This seriously hampered the quality of isotope research in the country and severely restricted training of young researchers in this field. To overcome the above limitations and to meet the ever increasing requirements of the researchers of India, DST through the SERC (now known as SERB) focused on creation of the state-of-the-art R&D infrastructure facilities for sustaining research in the academic and research institutions of India.

The Earth Sciences segment of the Science and Engineering Research Council now known as SERB had taken advantage of the above schemes and interacted with the leading earth scientists and encouraged them to evolve proposals for consideration under the Intensification of Research in High Priority Areas (IRHPA) scheme. Facilities like Inductively Coupled Plasma Mass Spectrometry (ICP-MS), Stable Isotope Geochemistry, Laser Ablation Magnetic Multi-Collector Inductively Coupled Plasma Mass Spectrometry (LAM-MC-ICP), Ar-Ar Geo-Thermochronology, Thermal Ionisation Mass Spectrometry (TIMS), Accelerated Mass Spectrometry (AMS), High Temperature-High Pressure Experimental facility, Isotope Ratio Mass Spectrometer (IRMS), Palaeo-magnetic Laboratory, Fission track dating

Laboratory etc have been supported to different Universities/ Institutions under IRHPA programme. Most of these facilities have made excellent research contribution since their inception and researchers from universities have considerably benefitted. Large number of students have also been trained in these fields who have got exposure to the above state of the art instrumentation facilities. It has been a good experience to share with larger scientific community that the above instrumental facilities are limited in a large country like India. Over these years, scientists running these facilities, have gathered considerable experiences in maintaining these facilities. The pertinent question here is that how to sustain these facilities for future use as taxpayer's money is being spent and lot of efforts have been made to create such a state of the art laboratory. It is a common feeling by the researchers that this is a SERB/DST facility and DST should take care of the same. As per the norms, SERB supports the facility in a project mode for certain period of time. After the duration of the project it is the responsibility of the host institute to maintain such facilities so that it can be useful for the students as well as faculties to carry out the research. Therefore, there is a need for a good co-ordination between the funding agency and the host institute to make such arrangements that it can sustain for future use for the benefit of the scientific community.

One of the most important concern is how to keep the facility active and also the availability of specially trained manpower. Many of these facilities are not having enough specialized trained manpower. The problem has compounded by the fact that several new institutes are trying to develop various laboratories as part of their inhouse infrastructure. As a result, there is an immediate requirement of manpower to handle these facilities. The major issue is that to keep the laboratory active, we need to continue our experimental earth science research active. We also need to answer some of the important scientific questions like age of Singhbhum Granite, oxygen isotope map of Closepet Granite, sulfur isotope data for sulfide deposits of India, deduce origin for hydrothermal fluids of gold and metal deposits of India, boron isotope data of our marine foraminifers etc. In order to achieve the above goal, we need to enhance our capabilities and chalk out achievable goals at national level.

At present the following facilities are available in India: (1) National Centre of Experimental Mineralogy and Petrology, University of Allahabad. (2) National Facility on Inductively Coupled Plasma Mass Spectrometry (ICP-MS), NGRI, Hyderabad. (3) Nation facility on Geochronology/Isotope Geology, UOR, Roorkee. (4) National Facility for Geochemical Research (NFGRI). (5) School of Environmental Sciences, Jawaharlal Nehru University, (6) National Facility for Geochronology and Isotope geosciences at Pondicherry University.