Survey Of India Activities in Antarctica (Past & Future)

Survey of India has started its participation with Indian Antarctica Research Programme, with Xth expedition 1990, for surveying, mapping and scientific studies in Schirmacher Oasis, in Antarctica. It did establish the primary control in the region, using GPS technology and triangulation method. By establishing the geodetic control and mapping on large scale of 1:5000 with contour interval of 5 metres, it has widened the national spectrum from the existing ‘A Setu Himachalam’ to ‘Antarctica to Himalayas’. It has strengthened the position of stations, fixed by GPS, by carrying out astronomical observations. In this way SOI is proving very helpful to other agencies involved in the exploration of this icy desert. In the course of operations it has provided useful profile to the scientists of Osmania University, engaged on this gigantic task to unfold the shrouded mysteries of Antarctica. Since its inception in this research programme, SOI is contributing to the scientific community, the useful scientific data to a larger extent. Being the premier mapping agency, Survey of India, has provided meaningful maps on Antarctica, to the scientific thinkers in planning their activities. Besides, for it self, it did extend all help and played a pivotal role in getting carried out GPS observations by Norwegian Geodetic Team at Maitri and made a collaborative programme in Antarctica with Germany, on Geodesy. In 1998-99, SOI took a giant leap by assisting Geological Survey of India for getting fixed their existing points by theodolite and EDM instruments, computations and their verification on the ground were carried out, as per laid down procedures of SOI. Its association with other participating agencies, involved in the exploration of Antarctica, proved to be of utmost importance. Right up to XXII expedition, its contribution to these organizations, viz. GSI, NBRI, ZSI etc., by providing the co-ordinates of locations of their interest, in this remotest region, is praiseworthy. Though, SOI has come a long-way in exploration of this icy desert but much is there, to be explored. Neo-tectonic studies and glacier movement studies have yet to be taken up for the real scientific users. By establishing dense geodetic control in the region, it will be possible to take up multidisciplinary geo-scientific programme including measurement of plate movement vectors in relation to neighbouring plates defining gravimetric geoid, using land and satellite altimetry data, determination of regional crustal deformation by making repeat GPS observations and establishing geodetic ties to Mean Sea Level for studies of glacio-climatic variations etc. In order to carry out these scientific studies, a GPS network is to be established in Schirmacher Oasis, having an area of 34 sq km.

For determination of neo-tectonic and glacial movement in this region, forty GPS stations are to be established, duly connected with precision levelling and gravity mesh, since it has been resolved that icy continent also experiences
neo-tectonic movements due to plate tectonic movement of the earth. With the establishment of GPS stations and their repetition, neo-tectonic movement of the region can be monitored. The study for intercontinental plate movement will also be taken up simultaneously.

Glaciological movement study is another very essential factor to be studied in Antarctica region as the global warming and depletion of ozone layer has led to ice melting, necessitating glacial movement monitoring and it will be dealt with, by precision levelling and gravity observations along with GPS observations duly repeated for four epochs. Tectonic geodesy requires long time series data, as such, data collection in the first phase will be taken into consideration to determine the localized strain accumulations in the Antarctica region. Hence, field-tectonic geodetic studies are planned for the near future, for long-term commitment, to investigate this geological phenomenon called Antarctica.

Though, too much is yet to be done with, with the mysterious and enigmatic Antarctica, but the work already carried out has led us in the direction which will make us reach to the destination where Antarctica will be in total openness and unfold. Uptil XXII expedition, SOI has very firmly established its name in the front line runners of participating agencies and with the ongoing endeavours and plans for the future, a day is not too far, when SOI will enlist its name, in the foremost agencies of this part of the globe, responsible for the exploration and unfolding the shrouded mysteries of this vast icy continent.