

## **Agenda Item - 11: Space and Water**

Mr. Chairman and distinguished delegates,

Space based inputs play an important role for effective management and sustainable development of water resources. Indian Space Research Organisation and Ministry of Jal Shakti, the nodal Ministry for Water Resources in the country, have jointly demonstrated utilization of Space technology for many aspects of water resources management and hydrological disaster mitigation. Concurrent use of remote sensing based inputs, spatial information systems, location based services and communication technology, is critical in developing decision support systems for managing water resources.

Space applications are developed in India in various domains of water resources such as reservoir sedimentation assessment, irrigation command area monitoring, irrigation infrastructure management, basin-wise water resources assessment, monitoring of snow; glacier and glacial lakes, flood forecasting & monitoring etc. Many of the operational space applications have been institutionalized through the concerned nodal departments.

Mr. Chairman,

As one of the implementing agencies of the National Hydrology Project (NHP), a flagship programme of Ministry of Jal Shakti, ISRO has enabled many geospatial products & services pertaining to water resources sector. These include Spatial flood early warning system, daily actual evapotranspiration, database of Himalayan glacial lakes, glacial lake outburst flood model, snowmelt rate forecast etc. A network of eddy covariance flux towers is installed and are being used for calibration and validation of the satellite derived data products.

Towards sustainable development of ground water, remote sensing based inputs are used in the country for identifying prospective zones of ground water development, and for planning locations of suitable recharge structures. Space based inputs are being used for decision support in planning and implementing various water conservation measures under the Jal Shakti Abhiyan- Catch The Rain- programme.

Mr. Chairman,

Critical gaps in the irrigation infrastructure can cause deviation of the actual irrigation potential developed from the planned potential, hampering the efforts for ensuring water security. Remote Sensing data, Geospatial platform and tools are being used for monitoring the progress of irrigation infrastructure creation, and to compare the irrigation potential generated and utilized, with the planned irrigation potential. This facilitates comprehensive monitoring of irrigation projects for timely completion and faster transmission of benefits to the end users.

Methodology has been developed for assessing basin scale water resources in the country, incorporating space derived inputs. A standard framework has been established for periodic re-assessment of basin scale water resources. The methodology has been utilized by the Ministry of Jal Shakti for deriving the latest update on country's water resources potential.

Mr. Chairman,

ISRO and Ministry of Jal Shakti have jointly developed a national level comprehensive Water Resources Information System called India-WRIS. It has long term database on India's water resources collected using space inputs and ground based observations, in addition to hydro-meteorological and environmental data from various stakeholders. The database is updated periodically.

A Water Body Information System, comprising of spatio-temporal dynamics of water bodies of size greater than 0.1 ha, at a frequency ranging from 5 to 15 days, has been implemented through ISRO's Bhuvan Geoportal.

Space technology is effectively used for mitigation of various hydrological disasters in the country. ISRO has developed operational spatial flood early warning systems for the Godavari and Tapi Rivers using space based inputs, including high resolution digital terrain models. These models are calibrated and validated using historic discharge and rainfall data, and the forecasts are disseminated through the Geoportals, aiding the disaster management activities. Flood early warning system called FLEWS is developed for the catchments of Brahmaputra and Barak rivers in the north eastern region of the country, towards delivering actionable alerts for the flood prone districts.

Mr. Chairman,

The effectiveness of the use of space technology in the water resources sector is attributed to the joint efforts of ISRO and various nodal agencies under the umbrella of Ministry of Jal Shakti. The adopted strategy comprises of developing prototype applications and then migrating these for operational implementation, along with capacity building of the users. Many of the space based applications are internalized or institutionalized by the Ministry. The Indian delegation would like to reiterate its willingness to share its experience on the use of space technology with member nations towards effective management and sustainable development of water resources.

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