

India

Agenda item 6

Space Technology for Sustainable Socioeconomic Development

Madam Chairperson and Distinguished delegates,

The Indian delegation would like to update on the developments on the efforts made in using space technology for Sustainable Development in India.

“Space Technology for national development”, is an important aspect envisioned in the Indian Space Programme. Space Application, one among the four verticals of Indian Space Programme, strives in converging the capabilities of Earth Observation, Communication and Navigation technologies for providing inputs in achieving Sustainable Development, Efficient Governance and Disaster Risk Reduction. Space technology has long been effectively used in India towards providing invaluable inputs for enabling security of food, water, energy, shelter, infrastructure and advisories on weather.

Indian Earth Observation (EO) programme is unique in the sense it is user driven, wherein EO missions are defined based on the requirements of the stake holders. Through the institutional mechanism involving the triad of Government-Academia-Industry, the space applications are driven through progressive enhancements using constructive feed-back mechanism.

Currently, India has a fleet of **13** Earth Observation satellites in orbit, which comprises of **11** remote sensing satellites in Low Earth Orbit (LEO) and 02 INSAT series of satellites, operating from geostationary orbit, with meteorological payloads.

Madam Chairperson,

Indian Space Programme is committed in effectively utilizing EO data and Geospatial tools for managing the natural resources of the country. Periodic assessment of the status & dynamics of natural resources is one of the prime contributions of Indian EO programme, enabling informed decision making. Deciphering the reduction in the productivity of land resources resulting from various degradational processes, leading to development of degraded/wastelands is another significant aspect of Indian EO programme. Space based inputs in the sustainable development of surface and ground water resources are also enabled.

Madam Chairperson,

Sustainable development demands well-planned urban development, for which space technology is being used in India for generating geospatial database supporting urban master plan preparation. Indian EO programme continues to emphasize on effectively utilizing space technology for crop production forecasting, horticulture development, irrigation potential assessment, soil health management, crop pest & diseases forewarning, renewable energy assessment etc. In the health and education sector, tele-medicine & tele-education programmes, geospatially enabled planning of healthcare facilities etc. are being enabled through the utilization of Geospatial technologies.

Sustainable development also envisages effective disaster mitigation, aided by forecast mechanism on impending disasters, towards disaster risk reduction. The Indian Space programme supports a well-coordinated Disaster management programme, which uses EO, Communication and Navigational inputs, aimed at developing a disaster resilient society. With its indigenous navigational system, messaging service with weather forecast information; including ocean state and potential fishing zones are being provided to the fishermen. This is in addition to the alerts enabled as fishing boats approach international maritime boundaries.

Madam Chairperson,

Under a unique programme called Natural Resources Census, National level land use/ land cover mapping at 1:250,000 scale is being carried out annually, since 2004-05. The database from this programme have been used in weather research forecast models and climate change studies. ISRO achieved the completion of three national level natural resources related assessments on 1:50,000 scale, using multi-temporal satellite data and made available to users. The output feeds into reclamation measures, increasing area under cultivation and for better land use.

Madam Chairperson,

India has given high priority for executing innovative space applications for agriculture sector since the early phase of EO application programme. Currently, ISRO offers application for crop production forecasting for nine major crops and work is underway to extend it for more crops. Such inputs help to plan policies and pricing regulations towards ensuring food security.

Under the National Food Security Mission, using Geospatial techniques, suitable areas have been identified in six states in the Eastern India, for vertical

expansion of agriculture, using short-duration pulses. ISRO is providing geospatial support for Soil Health Card scheme of Government of India. Geospatially enabled techniques are being developed to support the National Programme on Crop Insurance, including optimal planning of crop cutting experiment and crop damage assessment. Thus, space technology is being used on a wide range of applications in the Agriculture domain, enabling sustainable development.

Madam Chairperson,

India attaches utmost importance to sustainable development of its land and water resources. Under the “Integrated Watershed Management Programme (IWMP)” project, watershed development activities are being carried out for 86,000 micro-watersheds. Space based inputs are effectively used for generating land and water resources development plans, monitoring and impact assessment. Nearly one million locations of watershed development activities are geotagged on to the Bhuvan based geoportal, which also hosts the temporal, very high resolution satellite data, for assessing the impacts of the activities. Similarly, as part of one of the largest public funded citizen benefit scheme called Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA), geospatial services are enabled for monitoring the implementation of rural development activities. Nearly 36 million locations of rural development activities/ assets are geotagged using GeoMGNREGA, the geospatial application comprising of Bhuvan tools and Mobile application.

For sustainable management of the surface water resources, fortnightly surface water spread maps are generated, which are used for irrigation scheduling, inland aquaculture development etc. Geospatial and Information Technology based decision support systems are developed, and are operationally used for managing the water resources of states such as Telangana and Andhra Pradesh. This is in addition to the Geospatially enabled single-window solution called India-WRIS, for development and management of the water resources in the country. Using very high resolution satellite data and ancillary inputs, village level ground water prospects information generation and plan for sustainable development of ground water resources are being done.

ISRO and Ministry of Jal Shakti (MoJS) have initiated a national level programme for providing satellite data based geo-spatial products & services including Operational Spatial Flood Early Warning System, Evaporative Flux Monitoring System, Glacial Lake Outburst Flood (GLOF) model and spatial snowmelt runoff products in the Indian Himalayas.

Madam Chairperson,

Sustainable development of bio-resources is another major focus area of Government of India. A national programme has been initiated by ISRO along with Department of Biotechnology, for community level biodiversity mapping in the country. Coral reef is also an important link in the biodiversity chain, and a programme for mapping and monitoring the coral reefs resources and its health, using space inputs is being carried out.

Identification of forest disturbances is a crucial step in effective forest and environment management. An automated algorithm has been employed for identification of forest cover loss locations using temporal information from satellite data. India has been monitoring the Himalayan glacial lakes during June to October every year, since 2011, using satellite data. Assessment of the retreat/advance of glaciers spread over different parts of the Himalayan region is also being studied using both optical and microwave data. Snow cover products are being generated of Himalayan region and made available to users through ISRO's Geoportal.

Madam Chairperson,

ISRO is enabling inputs for preparation of GIS based master plan for sustainable development of urban areas. Comprehensive geospatial database of cities/towns across the country are being generated for 240 Cities/Towns, identified by the Government, for Urban Rejuvenation, under the flagship programme AMRUT (Atal Mission for Rejuvenation and Urban Transformation). This will further be continued to cover a total of 500 Cities/Towns. Geospatial services, mobile and web based applications have been deployed for geotagging of more than 7.7 million beneficiary houses, for monitoring constructions of dwellings, to enable transparent governance.

Madam Chairperson,

India's unique geographical, topographical and tectonic settings make it vulnerable to many natural disasters such as cyclones, floods, droughts, earthquakes, landslides etc. The Disaster Management Support (DMS) Programme of ISRO provides aerial & space based information and communication support, during the different phases of the disaster cycle. Coupled with weather research forecast modelling activities, advisories are being enabled for extreme weather events, cyclogenesis, cyclone track & land fall etc.

During 2019, India witnessed major floods in 185 districts of 14 states, during June to September. All the major flood affected states like Bihar, Assam and others were monitored using satellite data and about 145 flood maps, progression & recession maps and 110 value added products were disseminated to the concerned departments to support in rehabilitation, in near real time mode. During very severe cyclonic storm 'FANI', ISRO supported Odisha State, by providing value added products on damage assessment. Near-real time forest fire detections are done daily 6 to 8 times during February to June every year, and are used as inputs for ground teams managing forest fires. Major Forest fire in Bandipur district, Karnataka State was monitored and inputs were provided. In addition, ISRO activated International Charter and Sentinel Asia and obtained satellite data from various available sources for providing regular updates on the flood situation in the State, which was used for relief operations.

In 2019, ISRO has supported management of 21 disasters across 18 countries by providing around 65 sets of Indian satellite data. Through Sentinel Asia Programme, ISRO responded to 19 disaster events across 12 Asia Pacific countries and provided nearly 36 datasets from Indian satellites.

Using the messaging service developed over the indigenous regional navigation system called NavIC, India has enabled alert services to fishermen in the sea on impending disasters such as cyclone, high waves, information on potential fishing zones and also while approaching international maritime boundary, through NavIC receiver.

Madam Chairperson,

Indian delegation, in conclusion, would like to convey that India is exploring the space technology in various other domains, to make the benefits reach grass root. India has the necessary expertise to realize this and has demonstrated the same through various application projects towards achieving sustainable development.

Thank you Madam Chairperson.