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NORTH EASTERN SPACE APPLICATIONS CENTRE
उत्तर पूर्वी अंतरिक्ष उपयोग केंद्र

REFLECTIONS

The Quarterly In-House Newsletter of the North Eastern Space Applications Centre













Dr. S. P. Aggarwal
Director, NESAC

HIGHLIGHTS:

- *NESAC hosts ISRO/DoS Seminar on Computer Technology, Cyber Security and Mission IT (ISC²MIT-2026)*
- *4th Edition of NESAC User Interaction Meet (NeUIM-2026) held during 24-25 Sept, 2026*

From the Director's Desk

It gives me immense pleasure to present the October 2026 issue of REFLECTIONS, the quarterly in-house newsletter of NESAC, highlighting the Centre's continued efforts towards advancing space science and technology for the socio-economic development of the North Eastern Region. This issue showcases significant R&D initiatives, technological innovations, institutional collaborations and capacity-building activities undertaken by NESAC. The successful organization of the ISRO/DoS Seminar on Computer Technology, Cyber Security and Mission IT (ISC²MIT-2026) and the 4th NESAC User Interaction Meet (NeUIM-2026) reflect our commitment to promote knowledge exchange, strengthening user engagement and fostering collaboration among government departments, academia and industry. The issue also highlights important developments in geospatial applications, including riverbank erosion assessment, tourism development through the ManzilNE platform, smart agriculture, forestry and ecological studies, and the application of emerging technologies such as Artificial Intelligence and UAVs. Our continued outreach, training programmes and recognitions further reinforce NESAC's role as a key institution in translating space-based technologies into actionable solutions. I sincerely appreciate the contributions of our scientists, engineers and staff members in bringing out this issue and encourage everyone to continue pursuing excellence, innovation and collaborative research in fulfilment of the Centre's mandate.

Spatio-Temporal Assessment of Riverbank Erosion and Associated Agricultural Land Loss along the Brahmaputra, Barak, and Selected Tributaries

Ranjit Das, Priya Shejule, Dr. Rekha Bharali Gogoi

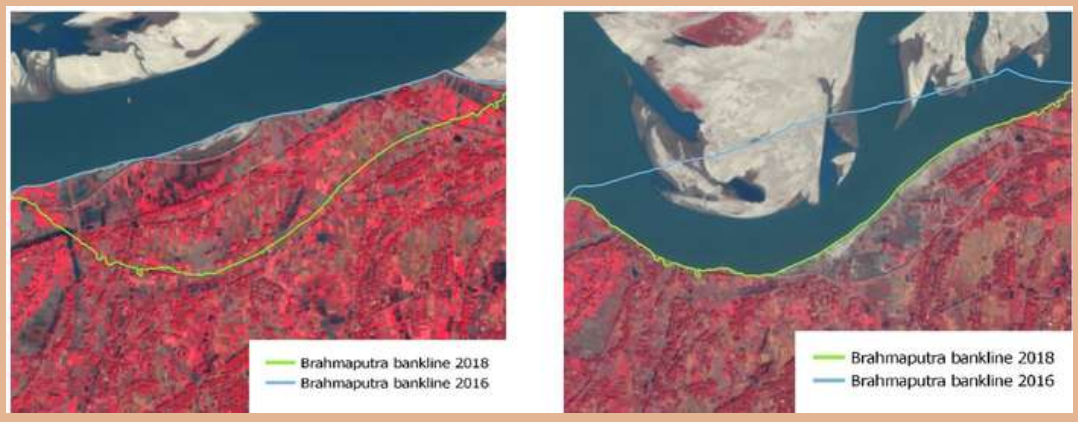
Riverbank erosion is a major recurring hazard in Assam, driven by the dynamic behaviour of the Brahmaputra, Barak and their tributaries. This study assesses the spatial and temporal patterns of riverbank erosion and associated agricultural land loss during 2016-2024 using multi-temporal satellite data. Sentinel-2 satellite imagery was utilized to map year wise river bank lines using Normalized Difference Water Index (NDWI) which were analyzed in GIS platform to estimate river bank erosion and deposition occurred during this period.

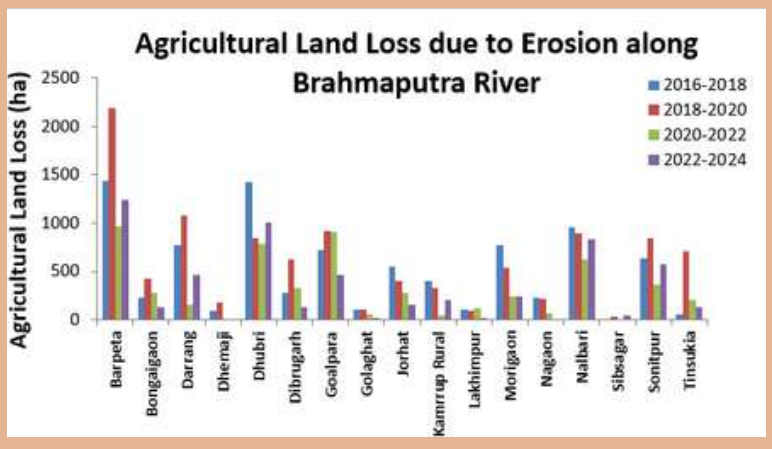
The analysis reveals significant erosion in the districts of Barpeta, Dhubri, Dibrugarh and Sonitpur. The river bank erosion intensified during 2018-2020, followed by a relative decline in several districts during 2022-2024. Agricultural land loss was particularly pronounced in Nalbari (80.89%), Goalpara (70.49%), Morigaon (63.34%), Barpeta (62.44%) and Dhubri (54.54%). Major tributaries, including the Subansiri, Beki, Manas and Dhansiri, also contributed substantially to localized erosion.

The findings highlight the vulnerability of agricultural landscapes along river Brahmaputra and underscore the importance of satellite-based monitoring for identifying erosion-prone areas, supporting sustainable land-use planning, and developing targeted riverbank erosion mitigation strategies in Assam.

Key Findings

- Identification of Erosion Hotspots
- Agricultural Land Loss
- Spatial Distribution of Erosion
- Vulnerable River banks
- Mitigation Planning





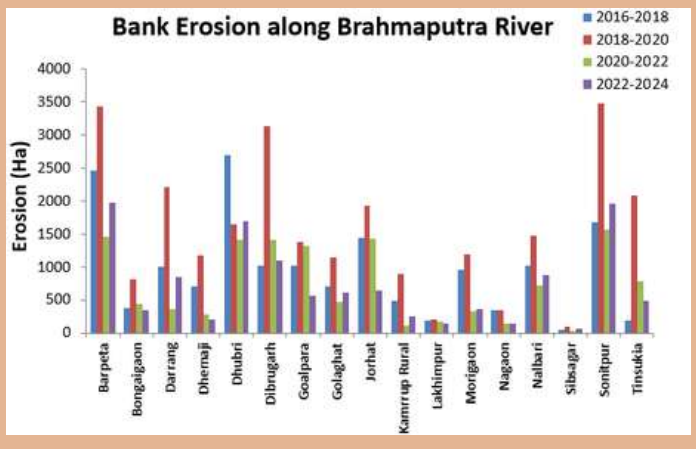


Figure: District-wise (a) Bank Erosion and (b) Agricultural Land Loss due to erosion along Brahmaputra River during 2016-2024

ManzilNE: Transforming Tourism in Northeast India through Geospatial Technology and AI

Nilay Nishant, Dibyajyoti Chutia, P S Singh, Victor Saikhom, Avinash Chouhan, Siddhartha Bhuyan, Abu Sahin, Pynshngainlang Marbaniang, Joyshree Das

Northeast India has huge potential for revenue generation through tourism, yet the geographic spread of attractions and the availability of tourism-related facilities make integrated information and informed planning especially important. To address this need, NESAC has developed an application called Manzil-NE under a project sponsored by the North Eastern Council (NEC) in 2021. Aligned with the NEC Vision Document 2030, the initiative brings tourism destinations, supporting infrastructure and curated routes together in a common geospatial platform. It is designed both to help travellers explore and plan journeys and to support tourism departments in assessing opportunities for sustainable development.

The platform combines location-based information and interactive maps with 360° panoramic imagery and an AI-powered itinerary generator. Its compiled database includes 1,270 tourist sites, 20,411 utility points, 349 panoramic photographs, 40 tourist circuits and 30 trekking trails in Meghalaya. These resources provide a consolidated spatial picture of the region's tourism landscape.

1,270	20,411	349	40	30
Tourist sites	Utility points	360° views	Tourist circuits	Trekking trails

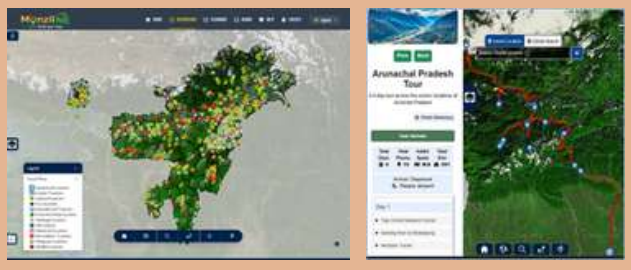


Figure 1 Spatial distribution of tourism destinations across Northeast India and visualisation of a tourist circuit in Arunachal Pradesh using the ManzilNE application



Figure 2: Glimpses from Brainstorming workshop

Table 1: State-wise database figures

State	Tourist sites	360° photos	Circuits	Utility points
Arunachal Pradesh	193	62	13	488
Assam	352	117	8	6,928
Manipur	68	16	3	1,257
Meghalaya	79	25	4	1,429
Mizoram	65	34	3	6,622
Nagaland	338	26	3	1,285
Sikkim	122	44	3	2,015
Tripura	53	25	3	387
Total	**1,270**	**349**	**40**	**20,411**

Its geospatial inventory covers heritage locations, cultural attractions, nature-based destinations and essential services such as accommodation, fuel stations, medical facilities and transport hubs. The application showcases the region's cultural festivals and tourism attractions, especially adventure tourism resources, while panoramic imagery offers an immersive introduction to selected locations. Each mapped tourist circuit allows users to assess the journey before setting out. The application is intended to serve tourism departments as well as visitors. As part of the stakeholder engagement process, a brainstorming workshop was organised on 3 March 2025, bringing together 41 participants representing tourism departments, non-governmental organisations, and other stakeholders from across Northeast India.

NESAC hosts ISRO/DoS Seminar on Computer Technology, Cyber Security and Mission IT (ISC²MIT-2026)



The ISRO/DoS Seminar on Computer Technology, Cyber Security and Mission IT (ISC²MIT-2026) was held during 22–23 October 2026 at NESAC. The Seminar was jointly organised by the North Eastern Space Applications Centre (NESAC) and the Indian Space Research Organisation (ISRO), Department of Space, to provide a platform for sharing recent advances, research findings and operational experiences in computing, cyber security, Mission IT, Artificial Intelligence and emerging technologies relevant to India's space programme.

The inaugural session was graced by Dr. V. Narayanan, Secretary, Department of Space and Chairman, ISRO, as the Chief Guest, who formally inaugurated ISC²MIT-2026 online. In his address, he emphasised the growing importance of IT across all strategic domains of the space sector and highlighted that the Seminar was timely and highly relevant, given the increasing role of advanced computing, Artificial Intelligence and cyber security in ensuring secure, reliable and mission-ready space capabilities.The session commenced with the welcome address by Dr. S. P. Aggarwal, Director, NESAC and Chairman of the Advisory Committee, followed by the address of the Chief Guest, Dr. V. Narayanan. Shri Rajiv Chetwani, Director, DISM, ISRO Headquarters and Alternate Chairman of the Advisory Committee, also addressed the gathering. The Guests of Honour, Dr. Prakash Chauhan, Director, NRSC (online), and Shri M. Ganesh Pillai, Scientific Secretary, ISRO, shared their perspectives on the importance of advanced computing, intelligent technologies, cyber security and inter-Centre collaboration in strengthening reliable, secure and mission-ready capabilities. The inaugural programme also included the release of the ISC²MIT-2026 Proceedings by Shri M. Ganesh Pillai, Scientific Secretary, ISRO, along with the other dignitaries on the dais.

The Seminar received an encouraging response, with 248 abstracts and 200 full papers accepted across six thematic areas. The two-day programme comprised 30 technical sessions, including two plenary sessions with six invited talks, during which 154 papers were presented. The sessions provided a valuable platform for scientists, engineers and technical professionals from ISRO/DoS Centres and Units to present their work, exchange knowledge and discuss emerging technological trends and challenges. A total of 195 participants from ISRO/DoS Centres and Units, including NESAC, attended the Seminar, reflecting strong ISRO/DoS inter-Centre participation. The Seminar concluded with participant feedback and the presentation of Best Paper Awards across the six thematic areas, recognising outstanding technical contributions.

4th Edition of NESAC User Interaction Meet (NeUIM-2026) held during 24-25 Sept, 2026



The 4th NESAC User Interaction Meet (NeUIM-2026) was held during September 24–25, 2026, at the Dr. K. Kasturirangan Auditorium, NESAC. The main objective of NeUIM-2026 was to showcase advancements and successful applications in space, geospatial, GeoAI, Digital Twins and emerging technologies; accelerate collaboration, knowledge exchange and innovation among stakeholders; and identify emerging user requirements and opportunities for partnerships, research, technology development and operational applications addressing regional and national developmental challenges. The Meet commenced with an invocation, ceremonial lighting of the lamp, and felicitation of the guests. The inaugural session began with the welcome and opening remarks by Dr. K. K. Sarma, Group Director, RSAG, NESAC. This was followed by addresses by Dr. S. P. Aggarwal, Director, NESAC; Shri P. L. N. Raju, Special Secretary, Science & Technology Department, Government of Assam; Shri M. Ganesh Pillai, Scientific Secretary, ISRO (online); and Dr. Prakash Chauhan, Director, NRSC (online). The session was then addressed by the Chief Guest, Shri Satinder Kumar Bhalla, ITS, Secretary, North Eastern Council (NEC), who formally inaugurated the Meet. The inaugural session concluded with a vote of thanks by Dr. Dibyajyoti Chutia, Chairman, Organizing Committee, NeUIM-2026 and Head, GID, NESAC.

The two-day Meet brought together 277 participants, including representatives from 119 State and Central Government departments/agencies (97 State and 22 Central), 26 academic institutions, and 35 industries/start-ups. The programme comprised five technical sessions and a concluding session, with 38 speakers from NESAC/ISRO, government, academia and industry sharing valuable insights, experiences and perspectives on emerging applications and opportunities in space, geospatial and allied technologies. One technical session was dedicated exclusively to Start-ups and Industry, providing a platform to showcase innovative solutions and explore potential collaboration opportunities. The valedictory programme concluded with a panel discussion involving technical experts and representatives from district administration, moderated by Dr. S. P. Aggarwal, Director, NESAC.

The Meet provided an important forum for user–developer interaction, experience sharing and identification of emerging requirements, further strengthening the interface between NESAC, its user departments, academia, industry and start-ups.

33rd AMRUT 2.0 Capacity Building training course at NESAC



The course, titled "Formulation of GIS-Based Master Plan for Tier-III Officials," was jointly organized by NESAC and the Town and Country Planning Organisation (TCPO) under the Ministry of Housing and Urban Affairs (MoHUA) from July 13 to August 07, 2026. It was attended by 12 nominated urban planning professionals from Madhya Pradesh, Maharashtra, Meghalaya, and Sikkim. The curriculum contained theoretical and practical modules on Remote Sensing, Geographic Information Systems (GIS), Unmanned Aerial Vehicles (UAV) surveying, geodatabase development, and GIS-based master plan formulation.

NESAC organizes 1-week special UAV training course for RSAC-UP officials



The course was conducted during 10-14 August, 2026 for the officials of Remote Sensing Applications Centre, Uttar Pradesh. The course covered UAV theory and its components, flight planning, data acquisitions for various remote sensing applications, 3D printing & its application in UAV, different data processing techniques, UAV data products, software tools for high-resolution UAV data processing, advanced topics and DGCA guidelines etc.

NESAC conducts two weeks short course on "Advanced Geospatial Technologies for Smart Agriculture"



The course was organized during 10-21 August and was attended by scientists, officials, faculty members and research scholars including officials from various state government departments and academic institutes. Participants engaged in theory, practical sessions and project work. Participants were given exposure to UAV data handling, GeoAI, Machine Learning & Predictive Modelling for smart agricultural applications. Dr. Pratibha Thakuria Das served as the Course Director while Dr. Pradesh Jena served as the Course Officer.

NESAC conducts one week training program for Master Trainers on "Farm Boundary Mapping using Geospatial Technology"



The training was organized by NESAC during 14–18 September 2026, with financial support from the Ministry of Agriculture and Farmers Welfare, Government of India. The training was aimed at strengthening the technical capacity of officials/scientists for effective farm boundary mapping and field data collection using advanced geospatial technologies. It was attended by 26 Master Trainers from 6 NER state government departments, State Remote Sensing Applications Centres and Autonomous Councils. Participants engaged in theoretical and practical sessions which also included demonstrations of the Krishi-DSS mobile applications for field data collection. Dr. Chandan Goswami served as Course Director while Dr. Pradesh Jena acted as the Course Officer.

NESAC Conducts two weeks short course on "Remote Sensing and GIS Applications in Forestry and Ecology"





The course was conducted by the Forestry and Ecology Division (FED), NESAC, from September 07–18, 2026, at the NESAC Outreach Facility. A total of 17 participants attended the course, including officials and field staff from the Forest Departments of Mizoram, Manipur and Meghalaya, university faculty, research scholars, and students. The course curriculum covered the fundamental concepts of remote sensing along with hands-on training using remote sensing data and relevant software. Participants were also introduced to advanced remote sensing applications involving UAV, LiDAR, microwave remote sensing, machine learning, and AI. Smt. H. Suchitra Devi, Scientist, served as Course Director while Dr. Dhruval Bhavsar, Scientist, served as Course Officer. Certificates were distributed to the participants by the Director, NESAC, Chief Guest of the programme, and Shri Rajendra G. Garawad, IFS, CCF, REWP, Forest Department, Assam, Guest of Honour. In his address, the Guest of Honour emphasised the importance of undertaking quality forestry work using remote sensing and GIS. The Director, NESAC, highlighted the significance and evolution of remote sensing technology in forestry applications and encouraged the participants to make effective use of these technologies in their respective fields.

Awards & Recognitions

FRAMS Project Team of NESAC Wins ISG Award



In recognition of its contributions to operational forest-resource monitoring through geomatics, the Indian Society of Geomatics(ISG) conferred the Galaxeye Udaan award for the year 2026 on the FRAMS Project team, NESAC. FRAMS is an integrated geospatial intelligence and forest monitoring system combining periodic forest datasets, advanced analytics, AI-driven disturbance detection, and near real-time alerts to enable precise, proactive, and data-driven forest management.

NESAC Wins first prize in pool-level Hindi technical seminar



The annual pool-level Hindi technical seminar for the year 2026 was organized on October 09, 2026, at the Branch Secretariat, Delhi Office. The seminar was titled 'Indian Space Policy, Innovation, and Future Direction'. Smt. Pratibha T. Das, Dr. Pradesh Jena and Dr. Francis Dutta participated in the Seminar. Smt. Pratibha T. Das secured first position in the seminar for her presentation on "Geospatial approach for climate-resilient crop diversification in Meghalaya".

NESAC celebrates the 80th Independence Day of the Nation



The celebrations were held on 15th August, 2026. The National Song & National Anthem were sung by staff of NESAC followed by hoisting of National Flag by Director, NESAC at 09:00 am. Director, NESAC addressed NESAC family where he paid tribute to the notable freedom fighters of the NE Region. He also urged NESAC community to follow the directions given by the Hon'ble Prime Minister towards a Viksit Bharat. CISF unit demonstrated a Weapons Drill as part of the Independence Day celebration. This was followed by 'Tiranga March'. Competitions were organized for NESAC staff, family members, kids and students of nearby schools prior to the event to spread awareness. An exposure and awareness visit was also made with pictures of 100 Freedom Fighters including the Freedom Fighters from NER onboard a vehicle to nearby schools as well as in Shillong. Prizes were distributed to the respective winners on 14th August at NESAC Auditorium.

Celebration of World Ozone Day 2026 and Swachh Sagar, Surakshit Sagar 5.0 at NESAC





NESAC in collaboration with the Indian Meteorological Society (IMS) - Shillong Chapter, celebrated World Ozone Day 2026 and the Swachh Sagar, Surakshit Sagar 5.0 (SSSS 5.0) Campaign on 16th September 2026 at the NESAC campus. 70 students from seven schools and one college from Meghalaya along with Research Scholars, Research Scientists, and Scientists from NESAC participated in the program.

The programme featured a range of engaging and educational activities, including a Climate Awareness Quiz and a Drawing Competition for students. The drawing competition was conducted on the theme "Clean Water Bodies for Thriving Lives and Sustainable Future." A special lecture titled "A Tale of Two Ozones" was delivered by Prof. P. K. Bhuiyan, Dibrugarh University, highlighting the distinction between protective stratospheric ozone and harmful tropospheric ozone.

NESAC and ICAR RC–NEH, Umiam Discuss Collaborative Opportunities in Geospatial Applications



A joint meeting was held on 22 September, 2026 between NESAC and the ICAR Research Complex for North Eastern Hill Region (ICAR RC-NEH), Umiam, Meghalaya, on potential areas of future collaboration and the signing of a Memorandum of Understanding (MoU) between the two Centres. The meeting was led by Dr. Kadirvel Govindasamy, Director, ICAR RC-NEH & Dr. S. P. Aggarwal, Director, NESAC. Discussions focused on the multidisciplinary application of geospatial technologies across agriculture and allied sectors.

NESAC Showcases India's Space Achievements through 'Space on Wheels' at The Assam Valley School





NESAC participated in the 31st Founders' Day celebrations of The Assam Valley School, Sonitpur, Assam, through the "ISRO Space on Wheels", held on 30–31 October 2026. The NESAC team ,represented by Dr. Francis Dutta, Scientist and Shri Pallab Das, PSS demonstrated India's remarkable achievements in space science and technology through interactive exhibits, models, visual displays and informative presentations aboard the Space on Wheels exhibition bus. The initiative provided visitors with an opportunity to explore India's space missions and the diverse applications of space science. The exhibition witnessed approximately 2,500 visitors. The demonstrations generated considerable interest among students and encouraged scientific curiosity.

Upcoming Events

Structured Training Program

NESAC will be hosting ISRO Officials for a Structured Training program on 'Space Based Inputs for Disaster Management' at NESAC Outreach Campus during November 2-6, 2026.

GIS Day Celebration

NESAC will celebrate GIS Day on 18th November, 2026

Table 1. List of Student Visits

Date of Visit	Institution	Coordinator	Students	Faculties /Officials	Total
5/8/2026	Shillong Polytechnic Shillong	Md. Abu Sahin	31	2	33
Aug 21, 2026	Union Christian College,Umiam Khwan	Shri Shantanu Das	11	6	17
Aug 9, 2026	National Institute of Technology Meghalaya	Dr.Chirag Gupta	176	7	183
Sep 15, 2026	Topcem Public School,East Jaintia Hills Meghalaya	Shri Rahul Pratap	37		37

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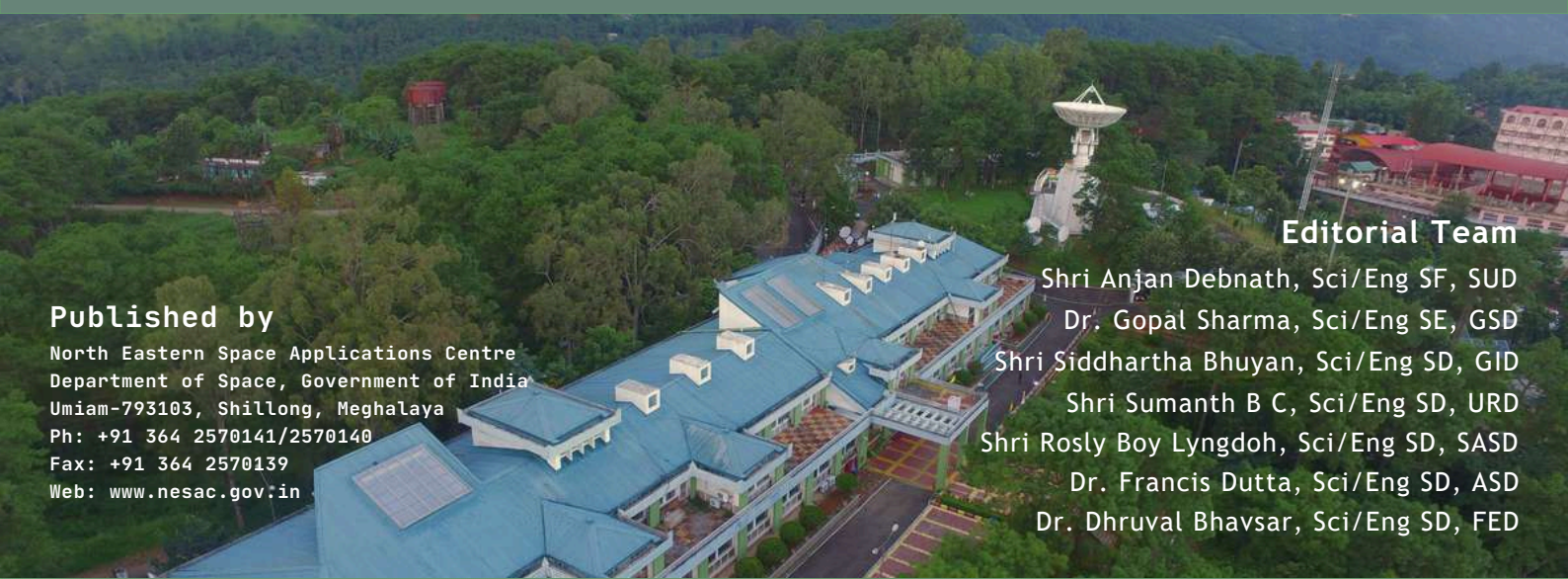
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