NESAC
उत्तर पूर्वी अंतरिक्ष उपयोग केंद्र
North Eastern Space Application Centre
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Reflections

BIANNUAL NEWSLETTER

Shri A S Kiran Kumar, Secretary, Department of Space and Chairman, ISRO and NESAC Governing Council, inaugurated the NESAC residential quarters situated at Umiam, on July 04, 2016. Shri Ram Muivah, Secretary, North Eastern Council, was also present during the inauguration function. Chairman, ISRO addressed NESAC team and congratulated them for successful completion of the project.

From The Director's Desk

Last six months have been very eventful for NESAC. The Department related Parliamentary Standing Committee on Science & Technology, Environment and Forests visited NESAC and gave very valuable suggestions to make the services rendered by NESAC, more effective and relevant for the society. Hon'ble Chairperson and Members of the committee were extremely happy and appreciative of the progress made by NESAC and promised all support for its further growth.

Another memorable event for NESAC was to witness Chairman, ISRO inaugurating the NESAC residential campus built up at Umiam, in presence of Secretary, NEC. This also coincided with the approval for setting up of an outreach facility consisting of 60 bedded hostel, three multimedia class rooms, and other associated infrastructure within a one acre campus very near to the NESAC main campus. With the availability of these facilities, NESAC will be able to contribute significantly in training and capacity building initiatives, which is a priority area identified by the Department of Space at national level, in recent times.

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Inauguration of NESAC Residential Campus

Shri Aman K. Singh

The residential campus of North Eastern Space Applications Centre (NESAC) was inaugurated by Shri A S Kiran Kumar, Secretary, Department of Space and Chairman, Indian Space Research Organization (ISRO) and NESAC Governing Council (GC) on July 4, 2016, in presence of Shri Ram Muivah, Secretary, North Eastern Council (NEC), Ministry of DONER, Government of India and Dr P G Diwakar, Dy Director, NRSC. The construction work for residential quarters consisting of staff quarters of C, D, E type and director's residence was completed on 30th June, 2016.

Figure 1: Shri A S Kiran Kumar, Chairman, ISRO inaugurating NESAC residential complex (4th from left). Shri Ram Muivah, Secretary, NEC (3rd from right), Dr P G Diwakar, Dy Director, NRSC (1st from left) and Shri P L N Raju, Director, NESAC (2nd from right) are also seen

Secretary, DOS; Secretary, NEC; Dy. Director, NRSC and others present during the function, visited all major parts of the residential campus, irrespective of heavy downpour during that time and suggested new amenities to improve living condition within the residential area. Director, NESAC and Director, CEPO (Civil Engineering Programme Office), ISRO HQ briefed them about the upcoming facilities such as guest house, recreation facility and proposed Outreach facility at NESAC.

Figure 2: Chairman, ISRO interacting with the CMD officials

On this occasion, while addressing the NESAC staff, Chairman, ISRO shared how ISRO and DOS attained the peak of success through continued effort by all scientists, engineers, and administrative staffs, irrespective of many challenges. He also inspired all by describing, how many innovative applications of space technology has been changing the lives of the poor and needy and solving many long pending problems in society. Chairman also congratulated Director, NESAC, Construction and Maintenance

Division (CMD), NESAC and all staff for successful completion of the project and asked Director, NESAC to complete the construction of rest of the facility at the earliest. Secretary, NEC, during his address described how NESAC has made its presence felt very strongly in the NE region of India and how various space based inputs from this centre has become an indispensible part of overall planning process for development and governance. Shri P L N Raju, Director, NESAC; Dr P G Diwakar, Dy Director, NRSC and Former Director, NESAC, and Dr. P. Sharma, Director, CEPO also addressed the NESAC staff on this occasion. The ceremony was ended with vote of thank by Director NESAC followed by light refreshment.

Facilities at residential complex:

NESAC residential complex is spread within an area of 10 acre at Umiam which is next to the NERIE, NCERT office complex and almost half a kilometer from NESAC office campus. The residential campus consists of Director's bunglow, 20 numbers of staff quarters (4 Type E quarters, 12 type D quarters, and 4 Type C quarters), sports complex, amenities building and a guest house. All the quarters have been constructed with a view to achieve 3 star GRIHA rating. The Guest house contains 10 guest rooms, 3 VIP suits, general dining area, VIP dining room and one conference room. The amenity building consists of community hall, shops, doctor's chamber and dispensary, nursery, gymnasium, an indoor sports building having badminton, table tennis, and carom playing facility. The complex also houses a temporary barrack for 44 numbers of CISF personnel.

The water required in the campus is provided from ground water supply. The water is treated centrally before it is pumped to all quarters. The campus also has power back-up facility through a diesel generator. The security to the campus is provided by the Meghalaya home guards.

Fig 3: A glimpse of Type - E Quarters in NESAC Residential Campus

continued from page 1

The state level meet on applications of space technology for governance and development for the state of Assam conducted on December 3, 2016, has opened up newer areas of space applications leading to more than 50 projects for the state of Assam. The sincerity of Govt of Assam, in executing these projects with technical support from NESAC, has accelerated the pace of implementation of many projects.

The centre also made significant progress in all major frontiers of scientific activities during last few months. The 12th meeting of NESAC governing council held on July 4, 2016 under the chairmanship of Secretary, DOS, while appreciated the all round effort of this centre in contributing to the overall development of NE region, also gave new directions to keep the momentum to meet the ever increasing expectations. NESAC is trying to expand the NER-DRR activity for next three years, Thanks to Chair, NESAC GC for his kind consent with enhanced activities like early warning of floods for whole of NER, thunderstorm nowcasting, landslides and earthquake precursor studies, etc. The SATCOM projects on tele-education and tele-medicine has been brought under top priority and all efforts are made to augment the existing networks with more nodes and improve network maintenance and management.

The activities of the centre are increasing both horizontally and vertically and we remain committed to outperform the expectation in all areas. NESAC is looking forward to have joint research initiatives with academic and other research institutes and collaboration with user departments to provide better operational services using space technology.

Geospatial strategy for identifying optimal sites for setting up of mobile telecom towers

Shri Victor Saikhom, Dr. Dibyajyoti Chutia and Shri P Subhash Singh

Over the last decade, significant developments have taken place in the telecom sector including major changes in the arena of institutional reforms as well as technological advances. The whole country is moving towards Next Generation Network and data oriented services, however, a large number of villages in NE region (NER) of India do not have 2G/3G coverage. It is seen that there is a substantial gap in the states of NER in terms of tele-density. In general, the reason for low tele-density and gap in telecom coverage in NER are due to the lack of necessary infrastructures for the establishment of telecom network and tough terrain. Hence, establishing the telecom towers to cover all the uncovered villages of NER is a high priority.

Effective utilization of geospatial technology can be adopted for locating the uncovered villages of the region and to identify the optimal sites for setting-up of new telecom mobile towers to connect all the uncovered villages with the rest of the country. Here, an attempt has been made to explore the effectiveness of geospatial technology to address the above issues regarding identification of optimal sites for setting up of new telecom towers for covering all the uncovered villages. The work for entire NER was carried out at the request of Department of Telecommunication (DoT), Government of India. A case study pertaining to West Khasi Hills District of Meghalaya, India is demonstrated here. West Khasi Hills district of Meghalaya covers an area of 828.74 sq.km with a total population of 45,262 as per 2011 census. Nongstoin is the district head quarter located at an altitude of 1409 m above sea level and 96 km away from the state capital, Shillong. There are 6 companies offering 4 types of internet services in 5 places in the state. Among these 5 places - 1 is municipality & 4 are towns. 3G/4G services in Meghalaya are provided by BSNL, Airtel, Vodafone, Idea and Reliance.

Both proximity and viewshed analysis have been adopted to identify the uncovered villages by the existing telecom towers. Multi-criteria spatial modeling using fuzzy membership based overlay function has been utilized for selection of suitable sites. Overlapping coverage zone (OCZ) based on the intersection of radial coverage of telecom towers was utilized to optimize the locations with least number of telecom towers to cover entire uncovered villages. Four different types of towers based on the tower heights and estimated range values are

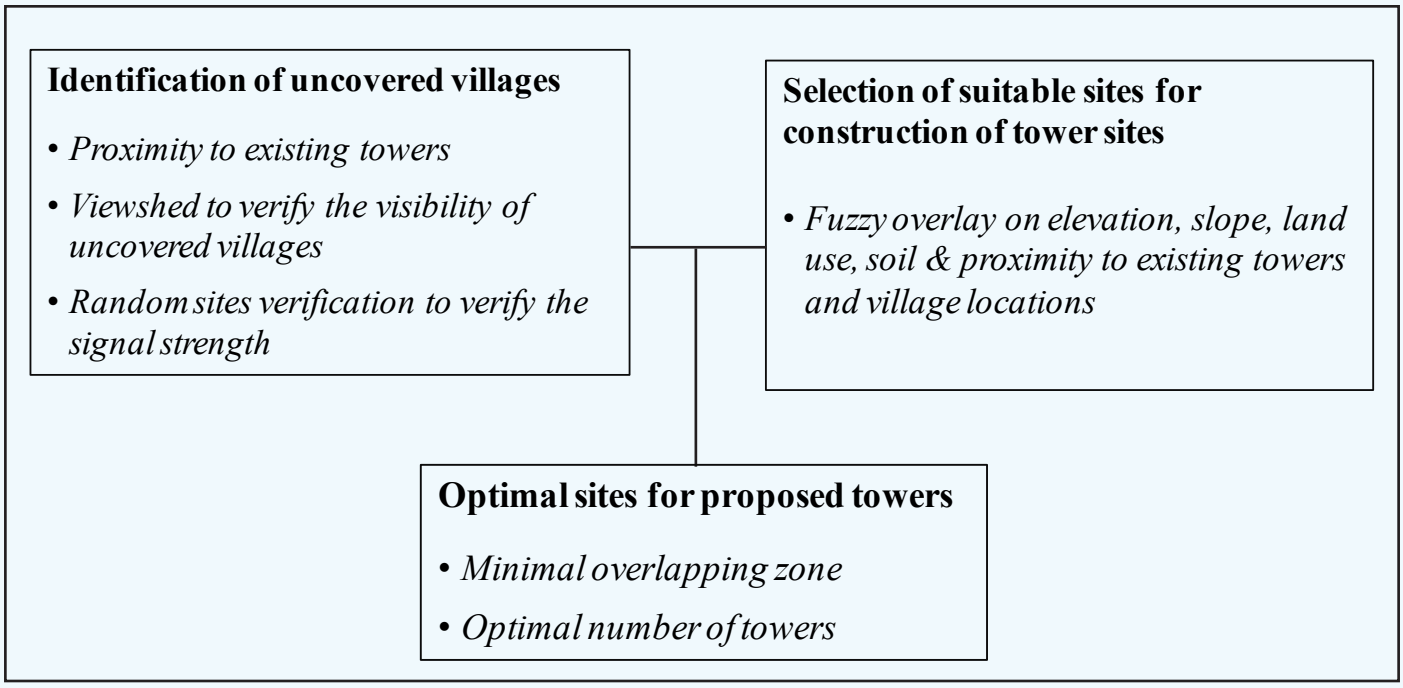

Figure 1: Overall methodology chart

considered for the study (Table 1). Each of the tower type has different tower height and range of coverage as defined by the DoT. The component of overall methodology is depicted in the Figure 1. If the village (as per Census 2011 record) locations are not spatially within the range of each of the towers, then they are treated as uncovered villages; where remaining villagers are considered to be within the range of towers. An example of viewshed analysis carried out to identify the uncovered village locations which are not visible by any existing telecom tower is depicted in the Figure 2. Field survey has been carried out randomly for 25 locations with a set of GPS-enabled smart phones using the SIM cards of all the existing mobile phone service providers to check the radio coverage.

Once the list of uncovered villages are identified and the areas for setting up of new telecom towers are defined using multi-criteria analysis, it is now required to select the locations of telecom towers within the suitable areas in order to cover all the uncovered villages with optimized number of telecom towers. The optimization model adopted here is based on the least possibility of conflicts as a criterion for optimizing the location of telecom towers. The possibility of overlapping is presented utilizing the overlapping or intersected coverage zone (OCZ) of telecom towers with respect to radio coverage. Optimal locations for setting up of new telecom towers proposed in the suitable sites are given as example in the Figure 3.

Usage of telecom service is now creating a new vista in the societal applications. Increasing expectation of cell phone users and the usage of information and ICT enabled services via cell phone in the entire world now demand the service providers to expand their network coverage to all the places including rural hilly areas like West Khasi Hills district of Meghalaya. The strategic location of telecom towers can ensure efficient provision of telecom services in a cost efficient manner.

Table 1: Specifications of various telecom towers (source: DoT)

Sl. No.	Tower type	Tower height (m)	Tower coverage radius range (m)
1	A1	20	1000
2	A2	20	2000
3	B	30	2000 - 4000
4	C	40	4000 - 6000

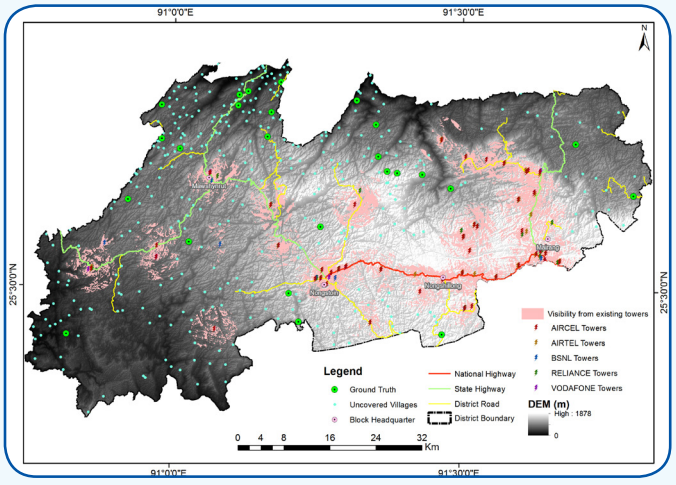

Figure 2: Locations of uncovered villages overlaid with existing telecom towers and road network.

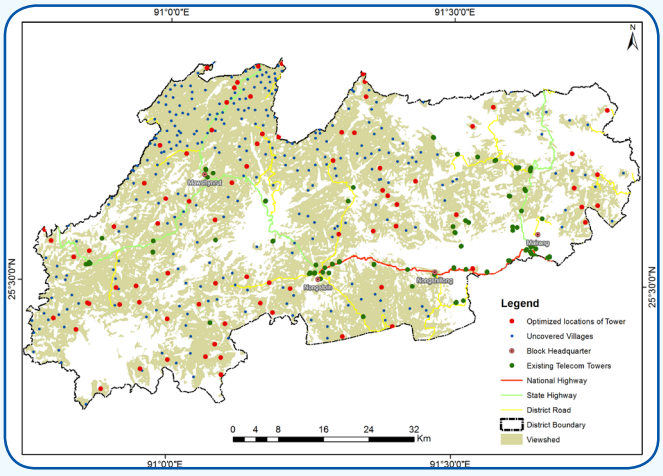

Figure 3: Optimal locations for setting up of new telecom towers with existing telecom towers and uncovered villages.

Establishment of an aerosol observatory at Tawang, Arunachal Pradesh

Shri Shyam S. Kundu

NESAC in collaboration with Space Physics Laboratory (SPL), VSSC, Trivandrum has set up an aerosol observatory at the district headquarters of Tawang (Latitude: 27° 35' 29" N, Longitude: 91° 52' 23" E and Altitude: 2916 m above MSL, surface pressure 716 hPa) on the northwestern corner of Arunachal Pradesh in Eastern Himalaya, under the Himalayan Cryosphere Programme as part of the Aerosol Radiative Forcing over India (ARFI) project. The observatory has been established within the office premises of the Water Resource Division of Tawang district, Govt. of Arunachal Pradesh. A seven channel Aethalometer (AE33) was installed during September, 2016 to start the measurements which are expected to be augmented with more instruments for complete characterization of aerosol over the remote site.

Figure 1: The building where the aerosol observatory has been set up (left) and the Aethalometer after installation at Tawang, Arunachal Pradesh

The initial data set on BC mass concentration at Tawang is indicative of the very high influence of local vehicular emissions during day and near absolute absence of the anthropogenic sources during night. However, the BC concentration increases very significantly during early morning hours (local time 4 to 6 hours) and late evening hours (local time 17-18 hours). The sudden jump in BC concentration could be because of more dynamic boundary layer fluctuations and also local activities characteristic of the life style of the region.

The hourly mean concentration of black carbon (BC) also indicates dominance of fossil fuel emissions over Tawang. With the onset of winter from end of October, the biomass burning fraction, however, was seen to increase significantly. The HYSPLIT air mass back-trajectory analysis indicated transport of air from the Brahmaputra valley towards the Tawang, which could also increase the BC concentration.

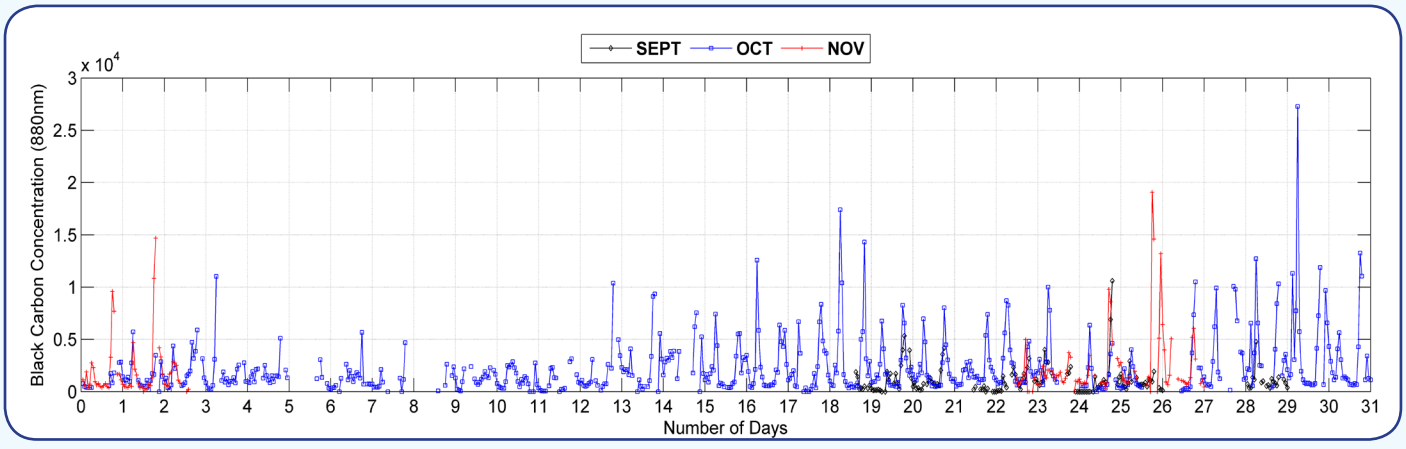

Figure 2: Mean hourly concentration of BC over Tawang

Promoting space technology based tools and applications in Governance and Development for the state of Assam

Dr. Bijoy K. Handique

The State level meet on promoting space technology based tools and applications in Governance and Development for the state of Assam was organised jointly by Assam Remote Sensing Application Centre (ARSAC), Indian Space Research Organisation (ISRO), and North Eastern Space Applications Centre (NESAC) at Assam Administrative Staff College, Guwahati on December 03, 2016.

The inaugural session started with the welcome address by Dr. K. K. Dwivedi, Commissioner & Secretary, Dept. of S & T and IT, Govt. of Assam. During his address, he recalled the discussion he had with Chairman ISRO during July 2016 and the assurance from ISRO in supporting applications of space technology tools for various developmental programmes in the state. Hon'ble Minister categorically mentioned that he had submitted a memorandum to the Government of India for establishment of a regional node of Indian Institute of Remote Sensing (IIRS) and Indian Institute of Space Science & Technology (IIST) in Assam towards capacity building and providing developmental support of the region.

Figure 1: The inaugural session is in progress with Hon'ble Minister for S & T and IT in the Chair (left). A section of participants in the state meet.

He highlighted the importance of space technology applications and requested all the departments to come forward to use the advance technologies. Dr. J. V. Thomas, Scientist from ISRO Head Quarters gave an overview of the Indian Space programme and sought cooperation of all the departments in formulating concrete proposals with space based inputs for implementation. Shri P. L. N Raju, Director, NESAC said in his address that the centre is assisting the government of Assam by executing a number of projects in different thematic areas. Shri Utpal Sarma, Principal Scientific Officer & Head i/c ARSAC gave a brief outline of activities carried out by ARSAC.

Shri Keshab Mahanta, Hon'ble Minister for S & T and IT was the Chief Guest at the inaugural Session. The inaugural function was followed by two Technical Sessions. 24 departments divided into 7 groups presented through both the technical sessions about their department level use of space technology and on their future plan on using the same. Around 50 major projects were proposed to be taken up by different departments in collaboration with ASTEC, NESAC, NRSC, etc. At the end of the Technical sessions, demonstration of Bhuvan geoporal of ISRO was made by Shri SVSP Sharma, Scientist, NRSC, Hyderabad.

Shri Sarbananda Sonowal, Hon'ble Chief Minister of Assam was the chief guest during the concluding session of the state meet. The session started with the welcome address by Dr. K. K. Dwivedi, Commissioner & Secretary, Department of S & T and

IT, Government of Assam. He briefed the Hon'ble Chief Minister, Assam about the different levels of preparation for conducting the state meet and the deliberations made from 24 departments throughout the day. Dr. J.V. Thomas presented the summary of finding solutions to the problems like recurring floods and erosion, poaching, illegal trades and terrorism through application of space technology. Stating state government's proposed plan to dredge river Brahmaputra covering a length of about 720

Figure 2: Hon'ble Chief Minister of Assam Shri Sarbananda Sonowal addressing the gathering during the concluding session of the meet.

presentations made by the 24 departments along with details of project proposed by each department.

Hon'ble Chief Minister, in his address as the Chief Guest of the concluding session invited all the Departments of Govt. of Assam to come forward and use space technology to its fullest potential. He stressed that through the proper use of science & technology all the 56 departments of the state government can work to their optimum level and can put the state into a growth trajectory. He requested ISRO, NESAC, and ARSAC to have a coordinated approach to make use of space technology to address various problems in the state. He requested space community to help the State government's bid in kms, Hon'ble Chief Minister urged upon ISRO to help the state in its endeavour in making the Brahmaputra primarily a central stream river and make it a vibrant source of river transport. He also requested for creating Water Resources Information System (WRIS), in similar line to that has been developed in the state of Telangana. He urged ISRO to consider the establishment of a regional node of Indian Institute of Remote Sensing (IIRS) and Indian Institute of Space Science & Technology (IIST) in Assam.

The meet ended with the Vote of Thanks offered by Dr Arup K. Mishra, Director, ASTEC.

The Department related Parliamentary Standing Committee on S & T, Environment & Forests visited NESAC

The Department related Parliamentary Standing Committee on Science & Technology, Environment and Forests, visited the North Eastern Space Application Centre (NESAC), Shillong on Oct 24, 2016. The committee was Chaired by Hon'ble Member of Parliament, Smt. Renuka Chowdhury and Hon'ble Members of the committee who visited NESAC included Sri Daddan Mishra, Dr K Gopal, Shri Vikram Usendi, Sri Pankaj Chowdhary, Shri E. T. Mohd. Basheer, Sri S R Balasubramoniyan, and Smt. M. Vasanthi Hon'ble Chairperson and of the committee. Dr. P. G. Diwakar, Scientific Secretary, ISRO made a technical presentation covering various aspects of the space applications activities that are being carried out in the region by NESAC, current thrust areas, and future plan. Based on the technical presentation, the Chairperson requested the members to raise specific questions and sought NESAC to give clarifications to the same.

All the members asked several questions related to space applications for developmental activities in NE

Figure 1: NESAC office staff with the Parliamentary Standing Committee

Members of the committee interacted with the ISRO, DOS and NESAC officials and desired to understand the functioning of NESAC, accomplishments, new challenges taken up, and the roadmap for future plan. The Chairperson also wanted to know the achievements of NESAC during the 12th five year plan, budgetary allocation and overall performance of the centre in the North Eastern Region (NER).

Shri P. L. N Raju, Director, NESAC gave a brief welcome remark and felicitation to all the members region. A few questions were also asked about space applications in rest of India. Hon'ble Chairperson informed that NESAC and ISRO can give a written reply to the questions raised by Hon'ble Members within 10 days from the meeting. Most of the queries were replied immediately by Scientific Secretary, ISRO; Director, NESAC and other senior Scientists from ISRO and NESAC. The written reply to all the queries were also sent to the committee within five days from the meeting.

The Department related Parliamentary Standing Committee on S & T, Environment & Forests visited NESAC

Figure 2: The meeting is in progress (left) and the committee visiting NESAC facilities

The Chairperson, in her concluding remarks, expressed satisfaction on the various scientific and technological solutions being provided by NESAC in the region. She stressed upon the effective use of such inputs by the line departments and other ministries, for benefit of common man. She also said that NER is a challenging area to work due to the inherent complexity of the region. She emphasized on the need for establishing backward and forward linkages at ground level for effective implementation of the space technology inputs in the region. Highlighting the importance of disaster management in the region, she suggested more interaction with all the stakeholders and stressed upon the need for effective use of information that is being generated by NESAC in the region.

The dinner was hosted by Government of Meghalaya on the same day which was participated by senior bureaucrats and officials from Government of Meghalaya. A cultural programme was also organized before the dinner.

The committee visited NESAC office on the next day October 25, 2016. Hon'ble Chairperson and Members were taken to all major facilities of NESAC and several applications were demonstrated. Hon'ble Chairperson launched a Dr Pisharoty Sonde using Hydrogen gas filled balloon and the committee was demonstrated how live data on vertical profile of atmosphere is collected. The committee was also demonstrated by flying the UAV and collecting sample images.

Figure 3: Hon'ble Chairperson and members of the committee before releasing Dr Pishaorty sonde attached to Hydrogen gas filled balloon

हिंदी और उसके विविध रूप

सुश्री नमिता रानी पाल

प्रत्येक राज्य की अपनी अलग-अलग भाषाएँ होती है। लेकिन उनका राज-काज जिस भाषा में चलता है और जो जन-संपर्क की भाषा होती है उसे ही राष्ट्रभाषा का स्थान प्राप्त होता है। भारत के स्वतंत्रता आंदोलन के दौरान ही हिंदी को राष्ट्रभाषा के रूप में स्वीकार कर लिया गया था। बहुभाषी भारत वर्ष में राष्ट्रीयता एवं देशभक्ति की भावना फूंकने के लिए एक संपर्क भाषा की आवश्यकता हुई जो समस्त जनता को एक सूत्र में बाँधने का काम करेगी और वही भाषा सरकारी कामकाज की भाषा भी होगी। कई वर्षों तक स्वाधीनता का आंदोलन चलने के बाद अंततः **15** अगस्त, **1947** को भारत वर्ष स्वाधीन हुआ। स्वाधीनता प्राप्ति के पश्चात सं.**1950, 26** जनवरी को संविधान गृहीत हुआ और इसी में राजभाषा का प्रावधान भी रखा गया। हमारे संविधान द्वारा यह व्यवस्था की गई की संघ सरकार की राजभाषा हिंदी होगी और प्रत्येक राज्य की राज्यिक भाषा वहा की राजभाषा होगी। इस प्रकार संविधान में दो प्रकार की राजभाषाओं का प्रावधान रखा गया। संघ की राजभाषा की दृष्टि से संविधान का भाग **17** (अनुच्छेद **343 -351)** अत्यंत महत्वपूर्ण है। संविधान के अनुच्छेद **343** में देवनागरी में लिखित हिंदी को संघ की राजभाषा घोषित किया। साथ ही अंकों का रूप भारतीय अंकों का अंतर्राष्ट्रीय रूप स्वीकार किया है।

इसके अलावा राजभाषा अधिनियम **1963** धरा **3 (3)** के अन्तर्गत **14** प्रकार के प्रलेखों को द्विभाषिक रूप में जारी किया जाना अनिवार्य है। इसी की पुनरावृत्ति राजभाषा नियम **1976** के नियम **6** में की गई है। इसके अन्तर्गत आने वाले प्रलेख निम्न प्रकार है:- संकल्प, सामान्य आदेश, नियम, अधिसूचनाएँ, प्रशासनिक तथा अन्य रिपोर्ट, प्रेस- विज्ञप्ति, संसद के किसी सदन या दोनों सदनों में राखी जाने वाली प्रशासनिक रिपोर्टें, सरकारी कागज़ - पत्र, संविदाएं, करार, अनुज्ञप्तियाँ, अनुज्ञा - पत्र, टेंडर फॉर्म।

वर्तमान समय में सरकारी कार्यालयों में इन चौदह प्रलेखों को द्विभाषिक रूप में (हिंदी - अंग्रेजी) जारी करने की कोशिश ही नहीं की जा रही, बल्कि पूरी तरह से ये इसी रूप में जारी किए जा रहे हैं। सभी सरकारी कार्यालयों में राजभाषा से सम्बंधित अधिकारी या कर्मचारी इन चौदह प्रकार के प्रालेखों को द्विभाषिक रूप में जारी करने में पूर्ण रूप से तत्पर रहते हैं। सरकार द्वारा भी कड़ा अनुदेश हैं की इसका शत-प्रतिशत अनुपालन सुनिश्चित किया जाए। वर्तमान समय में हिंदी के रूप में कई प्रकार के बदलाव आते जा रहें हैं। आधुनिकता की इस दौर में जब हर कही तीव्र परिवर्तन होते जा रहे हैं, वही हिंदी में भी यह बदलाव पूर्ण रूप से परिलक्षित होता आ रहा हैं। हिंदी के कई रूप हैं - राजभाषा, राष्ट्रभाषा, संपर्क भाषा, जनभाषा आदि। अपने हर बदलते रूप के साथ हिंदी पूर्व से और अधिक बेहतर होती जा रही हैं। राष्ट्र भाषा होने के साथ साथ हिंदी देश की राजभाषा भी हैं। राष्ट्र भाषा में साहित्यिकता होती है वही राजभाषा, प्रशासन एवं प्रशासित के बीच एक पुल का काम करती हैं। राजभाषा में आम लोगों की भावनाएँ या विचारधाराएँ नहीं होती हैं। इसमें लोगों की संवेदनाओं के स्थान पर व्यवहारिकता को अधिक महत्व दिया जाता हैं। इसीलिए इसे कभी - कभी संपर्क भाषा की संज्ञा भी दी जाती।

राजभाषा का क्षेत्र मात्र कार्यालय तक ही सीमित रहता हैं जबकि राष्ट्र भाषा का क्षेत्र विस्तृत हैं। यह साहित्यिक, सांस्कृति, एवं सामाजिक क्षेत्रों में भी फैला हुआ हैं। सरकारी कामकाज में भी हिंदी के प्रयोग का मुख्य उद्देश्य उसको जटिल बनाना नहीं हैं, वरन हिंदी को सरल बनाते हुए सरकारी कामकाज के माध्यम से उसे और अधिक सशक्त करना हैं। हिंदी एक उन्नत भाषा होने के साथ-साथ इसका एक विशाल साहित्य भी हैं। कार्यालयी हिंदी में पारिभाषिक शब्दों या तकनिकी शब्दों की जो थोड़ी बहुत समस्या थी उसे भी वैज्ञानिक तकनिकी शब्दावली आयोगद्वारा पूरी कर ली गई हैं। इसी के साथ हिंदी भाषा सरल होने के साथ-साथ बोधगम्य हो गई है।

NEWS AND EVENTS

12th meeting of NESAC Governing Council

The 12th meeting of NESAC Governing Council (GC) was held at NESAC on July 04, 2016. The meeting was chaired by Shri A S Kiran Kumar, Secretary, DOS and Chairman, NESAC GC and ISRO. Shri Ram Muivah, Secretary, North Eastern Council and Alternate Chairman, NESAC GC; Shri Tapan Mishra, Director, SAC; Shri H Gyan Prakash, Special Secretary S & T, Govt. of Manipur; Shri L Akato Sema, Secretary, Govt. of Nagaland, Dr P G Diwakar, Dy Director, NRSC and several members from state and central government departments were also present during the meeting.

Chairman, NESAC GC extended a warm welcome to all members of GC and appreciated the efforts made by NESAC in overall developmental process in the NE region of India. He told that, with the successful conduct of the national meet on use of space technology for Governance and Development, the expectations by various user and nodal departments of central and state governments, have increased exponentially. He called upon NESAC, to come up with innovative methods to meet this ever increasing demand. Shri Ram Muivah, Alternate Chairman, NESAC GC informed that NEC wishes to make extensive use of space technology to monitor the progress of various developmental projects funded by NEC. Shri P L N Raju, Member secretary briefed about NESAC activities with emphasis on new activities related to UAV applications. All the

members stressed on uninterrupted data sharing among different departments and requested NESAC to play a catalytic role in facilitating the same.

Chairman, ISRO and other members of GC visited major facilities at NESAC including a demonstration on Unmanned Aerial Vehicle. Chairman, ISRO also interacted with NESAC staff during the visit.

Independence Day Celebration at NESAC

70th Independence Day of India was celebrated at NESAC on 15th August, 2016 through a colorful

program. Apart from hoisting of National Flag by Director, NESAC in presence of a large gathering consisting of NESAC staff and NESAC CISF Unit, the program had events for elders as well as children who participated merrily. Prizes were distributed to winners of various events.

Celebration of Remote Sensing Day at NESAC

The National Remote Sensing Day is celebrated every year on the occasion of birth anniversary of

Prof. Vikram Sarabhai. This was also celebrated at NESAC on August 12, 2016 jointly by NESAC and Indian Society of Remote Sensing (ISRS), Shillong Chapter. Director, NESAC addressed the enthusiast participants on the occasion and delivered a talk on how the remote sensing has evolved in India and how this is changing the way natural resource is managed and developmental planning is made. Prof B S Mipun, Vice President, ISRS, Shillong Chapter also addressed the gathering during the occasion.

Celebration of Hindi Fortnight at NESAC

Hindi Fortnight was celebrated at NESAC during September 1-15, 2016 when the staff of NESAC took

part in various events organized throughout the two weeks to encourage the use of Hindi in official work. Various interactive events including orientation classes for teaching Hindi were held at NESAC. Many programmes were organized to promote use of Hindi at all levels and prizes were given to winners of various competitive events, both at group level as well as individual level.

Celebration of NESAC foundation day

The 16th foundation Day of NESAC was celebrated on Monday, September 05, 2016 at Umiam with full enthusiasm. The day was also chosen to officially release the North Eastern District Resources Plan (NEDRP) portal. This year, the foundation day celebration was made special by organizing talks by eminent academicians from the region and distribution of awards under various categories.

Dr. J. S. Parihar, founder Director of NESAC and former Satish Dhawan Professor, ISRO & Dy. Director, SAC, Ahmedabad graced the occasion as the chief guest. He delivered a talk on "Space Technology for Development of NER". Dr. Amarjyoti Choudhury, former Vice Chancellor, Guwahati University & Pro VC, Tezpur University, delivered a talk on "Technology demands for development of NER" and Dr. Dulal C Goswami, former Professor, Guwahati University, delivering a talk on "Wealth and woes of the Bhramaputra River: Geospatial Technology & Management" on the occasion of NESAC Foundation day celebrations Many officials and public representatives from the area were also present. Shri C. H. Kharshiing, Advisor (Planning), North Eastern Council (NEC) released the NEDRP portal in the public sphere. Shri Kharshiing

appreciated the efforts made by NESAC for development of north eastern region.

Celebration of Vigilance Week & Rashtriya Ekta Diwas at NESAC

NESAC celebrated National Ekta Diwas (National Unity Day) on 31st October, 2016 to commemorate the birthday of Sardar Ballavbhai Patel. The Viligance Awareness Week was also celebrated from 31st October to 5th November, 2016. Director and staff of NESAC took pledge for working within the guidelines of Central Vigilance commission and remaining vigilant in all official work. The pledge taking ceremony was held at NESAC Auditorium.

Two Week Unmanned Aerial Vehicle RS Course at NESAC

Two week long Unmanned Aerial Vehicle (UAV) Remote Sensing course was organized at NESAC from 31st October to 11th November, 2016. Participants from various NE states attended the training. The training course had lecture classes as well as hands on demonstrations with state of the art Unmanned Aerial System (Quadcopter, Hexacopter etc.) as well as data processing software. It also included one demonstration of operation of fixed wing UAV designed at NESAC and a field trip to Cherrapunjee, Meghalya where the UAV was flown to take aerial photographs.

Workshop on Forest Fire & its Mitigation in NER

In order to review the current status and future plan of activities in forest fire management, a one day brainstorming session on "Forest Fire Scenario and its Mitigation in North Eastern Region" was organised at NESAC on November 09, 2016. The technical programme during the workshop focused on improving the space based inputs for forest fire alert system for mitigation at the ground level, understanding the field level requirement and identify ways to bring awareness at the community level about the consequences of forest fire, develop institutional linkages by bringing together institutions / organizations / government departments.

Various important institutions and organisations participated in the workshop including NRSC, Hyderabad and SAC, Ahmedabad and delegates from department of Forest and Environment, Meghalaya, Rajiv Gandhi University, Itanagar, Dibrugarh University, Assam, Mizoram University, Mizoram Disaster Management and Rehabilitation Department, Manipur Remote Sensing Centre, Nagaland Science and Technology Council and NGO's including Federation of Hima under Umiam Mawphlang sub-watershed and Asian Confluence, Shillong.

State level Workshop cum Training programme on EPRIS for Meghalaya

The State level workshop cum training programme on "Empowering Panchayati Raj Institutions Spatially (EPRIS)" for the state of Meghalaya was organized jointly by NESAC, National Remote Sensing Centre (NRSC), Hyderabad and District Council Affairs Dept. of Meghalaya at NESAC on 14th December, 2016. Shri Prestone Tynsong, Hon'ble Minister, District Council Affairs, Govt. of Meghalaya graced the occasion as chief guest. Commissioner & Secretary of District Council Dept., Deputy Commissioners, representatives from Garo Hills Autonomous District Council (GHADC), Khasi Hills Autonomous District Council (KHADC), Jaintia Hills Autonomous District Council (JHADC), representatives from C & RD blocks & other line dept. along with scientists from NESAC attended the programme.

In his address Shri Prestone Tynsong, Hon'ble Minister, District Council Affairs, Govt. of Meghalaya appreciated the activities of NESAC for development of North Eastern Region particularly Forest Working Plan for the State of Meghalaya. He has suggested to take-up one more district in GHADC capacity building programme in addition to East Khasi Hills under KHADC. Further, he has suggested to take-up the digitization of land records for all the three ADCs i.e. GHADC, JHADC and KHADC. He has focused on involvement of village heads in capacity building as well as asset mapping activity. He emphasized on using space technology for livelihood promotion and transforming Meghalaya through collaboration of NESAC, State Depts. of Meghalaya and ADCs.

Shri T. Dkhar, IAS, Commissioner & Secretary, District Council Affairs Dept., Govt. of Meghalaya appreciated the efforts of NESAC in carrying out EPRIS activities in collaboration with District Council Dept. of Meghalaya and ADCs. He has assured of all cooperation in organizing district level and block level workshop and asset mapping at village level.

Upcoming Training Programme

NESAC

2nd BASIC COURSE ON REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM *TECHNOLOGY & APPLICATIONS*

April 17-28, 2017

North Eastern Space Applications Centre
Department of Space, Government of India
Umiam-793103, Meghalaya
www.nesac.gov.in

About the course

NESAC announces short course on the "Basic course on Remote Sensing & GIS-Technology and Applications" for the year 2017. This course is designed to provide sufficient knowledge and advanced training in the field of Geospatial domain and Earth Observation applications.

Details of the course:

Title : **Basic course on Remote Sensing & GIS-Technology and Applications**
Duration : **2 weeks**
Period : **17-28 April, 2017**

- **Remote Sensing and Digital Image Analysis** (Concept of Remote Sensing, Digital Image Processing and analysis, Aerial Photography and Photogrammetry, etc.)
- **Global Navigation Satellite System** (Various GNSS, IRNSS, GAGAN, etc.)
- **Geographic Information System** (Spatial mapping concept, GIS database/ RDBMS creation, Geographic Analysis and modelling, SDSS/ SDI, etc.)
- **Open Source SW and standards** (OSGeo concept, QGIS, WebGIS applications, etc.)
- **Ground Truth & field validation** (Field data collection, ground truth verification and integration in GIS)
- **Hands on training**

The course will mainly emphasize on overall understanding of basic concepts, modelling technological trends, applications and the utilization of Geospatial technology for Natural Resources Management, Urban and Infrastructure Planning, Location based services, Utilities Management, etc.

Who can apply

The course is designed for Government Officials/ Academicians/ Researchers/ Students/ NGOs/ Private agencies who are interested to explore space technology tools for water resource management, infrastructure development, environmental analysis, disaster management, etc.

Course Fee & Facilities

The course fee of ₹ 3,500/- is charged for each participant which includes registration kit and field trip to Cherrapunjee/ Shillong, etc. Accommodation and mess facility will be arranged at NESAC or nearby with varied charges which may cost ₹ 250/- to ₹ 350/- per participant per day.

Please send course fee of ₹ 3,500/- by a crossed demand draft drawn on any Nationalized Bank in favour of Director, NESAC and payable at SBI, Umiam Branch (Branch Code 2010).

How to apply

Interested individuals/ institutions may download the application online from www.nesac.gov.in and submit the filled in application and that should reach latest by 3rd April, 2017 in the below mentioned address. Total number of seats is 30, confirmation will be provided on first come first service. Sponsoring organization may send their applications with proper sponsorship.

For further information, please write to
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Please visit **www.nesac.gov.in** regarding updates on the courses.

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