



In This Issue

Important Events	p1
Significant Events	p2
MoU/Workshops	p3-4
Meeting/Conference	p5-7
Lectures/Talk	p8
Presentation/Foreign Deputation/Trainings	p9
Visitors	p9-11
राजभाषा अनुभाग	p12-13
Research & Publications	p14
Outreach and Media Interaction	p15
Infrastructure Development & Installations	p15-16
Weather Information	p16-17



Published by

India Meteorological Department,
Mausam Bhawan, Lodi Road,
New Delhi - 110 003

Tel. : 011- 24344298
Telefax : 91-11-24699216 &
91-11- 24623220

<https://mausamjournal.imd.gov.in/>
email : mausamps@gmail.com

Edited by

Dr. V. K. Soni
Mr. Sunny Chug

Compiled by

Staff of Editorial Office

Important Events

Hon'ble Minister of Earth Sciences Shri Kiran Rijju Ji visit to India Meteorological Department (IMD): Hon'ble Minister of Earth Sciences **Shri Kiran Rijju Ji** visited the India Meteorological Department (IMD) on 26th July, 2023. **Dr. M. Ravichandran**, Secretary Ministry of Earth Sciences and **Dr. M. Mohapatra**, DG, IMD led the team of experts from IMD to explain the **Hon'ble Minister** about various activities and services provided to the country and the region. **The Hon'ble Minister appreciated IMD** for the progress made in recent years in terms of forecast accuracy, service delivery, sectoral applications, impact-based forecast and risk based warnings. **The Hon'ble Minister addressed the Press and Electronic Media and appreciated the achievements of IMD especially w.r.t. the early warning services provided for Biparjoy cyclone**, which helped the disaster managers and public to ensure zero loss of life over Gujarat. The Hon'ble Minister specifically appreciated the services provided by IMD to farmers, fishermen and other stake holders.



Meteorological data communication system of IMD being explained to Hon'ble Minister



DG, IMD explaining about activities including indigenous decision support system for weather forecasting of IMD to Hon'ble Minister

During the G20 event held at Bharat Mandapam, IMD ensured timely provision of Weather Services and distributed weather updates across a range of platforms, including Twitter, Facebook, and WhatsApp. The weather information were made also available through a dedicated webpage (<https://mausam.imd.gov.in/g20>), this encompassed the delivery of both real-time nowcasts and detailed weather forecasts for the Bharat Mandapam area during the event.



IMD Nowcast & Weather Forecast during G20 Event



Hon'ble Minister of Earth Sciences Shri Kiran Rijju Ji addressing the Press

Significant Events

Inauguration of Meteorological Centre at Port Blair, Imphal, Kohima and Aizawl : Hon'ble Minister of Earth Sciences Shri Kiren Rijiju Ji inaugurated four Meteorological Centres at Port Blair, Imphal, Kohima and Aizawl on the occasion of 17th Foundation Day of Ministry of Earth Sciences on 27th July, 2023.



Hon'ble Minister of Earth Sciences Shri Kiren Rijiju Ji virtually inaugurated the Meteorological Centres. Left to Right: Shri D. Senthil (Joint Secretary, MoES), Dr. M. Ravichandran (Secretary MoES), Hon'ble Minister Shri Kiren Rijiju Ji, Dr. M. Mohapatra (DG, IMD) & Shri Vishvajit Sahay (Add. Secretary & Financial Advisor, MoES)

Dr. M. Mohapatra, DG IMD hoisted National Flag of India at IMD on the occasion of 77th Independence Day on 15th August, 2023. IMD Officials alongwith their families participated in the event. DGIMD addressed all the participants on this occasion.



Dr. M. Mohapatra, DG IMD hoisted National Flag on the occasion of 77th Independence Day on 15th August, 2023

IMD hosted the 2nd Meeting of WMO's Advisory Group on Severe Weather Forecasting (AG-SWF) Programme at New Delhi during 19-21 September, 2023 with experts from WMO and various severe weather forecasting centres across the globe. The meeting was inaugurated by **Dr. M. Ravichandran**, Secretary, MoES in presence of **Dr. M. Mohapatra**, Director General of Meteorology, IMD and released the (1) upgraded website of "Severe Weather Forecasting Programme (SWFP)-South Asia" and (2) a Souvenir on "Severe Weather Forecasting Programme- South Asia". Mrs. Monica Sharma, Sc-D participated in the meeting as Co-Chair of the AG-SWF programme.



2nd Meeting of WMO's Advisory Group on Severe Weather Forecasting (AG-SWF)

Under the Severe Weather Forecasting Programme (SWFP), the Regional Specialized Meteorological Centre (RSMC), New Delhi provides guidance and forecast every day valid for next five days to nine member countries in South Asian region (**Thailand, Myanmar, Bangladesh, Nepal, Bhutan, India, Sri Lanka, Maldives and Pakistan**) since 2016.

IMD conducted Pre-cyclone exercise and preparedness Meeting for the cyclone season (April-June) on 29th September, 2023 under the chairmanship of **Dr. M. Mohapatra**, DG IMD. The meeting was held through hybrid mode. Mr. Harsh Gupta, Project Director NCRMP participated in the meeting. The objective of the meeting was to share various achievements of IMD, it's initiatives and to take stock of it's preparedness for the ensuing cyclone season and most importantly to develop an effective liaisoning with various stake holders. There were about 280 participants from different organisations including central level disaster management agencies, state level disaster management (DM) agencies, various Ministries & Departments, IMD's sister organisations and research institutes.



Pre-cyclone exercise and preparedness Meeting for the cyclone season

Shri Bikram Singh, Sc.-F briefed the **Hon'ble Governor of Uttarakhand Lt. Gen. (Retd) Gurmeet Singh** about the ongoing monsoon activities and the services being provided by Meteorological Centre Dehradun on 17th August, 2023 at Raj Bhawan, Dehradun. The Hon'ble Governor of Uttarakhand praised the Officers and Staff of Meteorological Centre Dehradun for accurate and timely weather forecast and warnings services given for Uttarakhand state.



Shri Bikram Singh, Sc.-F briefed the Hon'ble Governor of Uttarakhand Lt. Gen. (Retd) Gurmeet Singh



Dr. M. Mohapatra, DG, IMD & Prof. Sunil S. Bhagwat (Director, IISER Pune) with Dr. K. S. Hosalikar

Under directions of Dr. M. Mohapatra, Director-General of India Meteorological Department (IMD), with guidance of Mr. K. S. Hosalikar, Sc.-G and Head of Climate & Research Services Pune and with planning by Shri Anjit Anjan, Sc.-E, a dedicated team of three members, including Shri B. Sudarsan Patro, Sc.-D, Shri Manoj Gujar, Met-A and Shri Parsottam, S.A., successfully installed an Automatic Weather Station in proximity to the G20 event on 4th September, 2023. This station, named PRAGATI_MAIDAN_G20_SUMMIT, provided real-time weather updates at 15-minute intervals, with live data dissemination to websites. The system performed satisfactorily and reported rainfall on 9th and 10th September, 2023. The unwavering support provided by Dr. V. K. Soni, Sc.-F, Dr. Manish Ranalkar, Sc.-F, Dr. Sanjay Bist, Sc.-E and their dedicated team in Delhi.



IMD signed an MoU with Shiksha 'O' Anusandhan Deemed to be University, Bhubaneswar on 12th August, 2023 to promote research and development between the two institutes.



SID CRS Pune Team installing AWS for G20 event at Delhi

MOU

India Meteorological Department signed an MoU with Indian Institute of Science Education and Research Pune (IISER), Pune on 4th August, 2023 to promote research and development between the two organisations. Dr. Mrutyunjay Mohapatra, DG IMD presented a public lecture on Climate Change and Our Role at the IISER Pune institute on 4th August, 2023.

Human Resource Development Activities

WORKSHOP

Smt. Suman Gurjar, Sc.-D and Shri Parmod Kumar, Sc.-C attended eOffice Administrator Capacity Building Workshop from 11-13 July, 2023 at National Data Centre (NDC) Shastri Park New Delhi.

India Meteorological Department jointly with WMO conducted 1 - Day Awareness Programmes for Disaster Managers and Media on Flash Flood Guidance Services at Delhi and Chandigarh on 9th and 10th August, 2023 respectively. Chief Guest of the workshop at Delhi was Dr. Kamal Kishore, member secretary NDMA. The workshop at Delhi and Chandigarh was attended by the members from various organizations involved in Flood Management and Disaster management. NDMA, NDRF, Print and electronic media Revenue Department, Irrigation and Water

resources, along with the members from WMO Shri Ramesh Tripathi and Ms. Rokaya BA and officials of MC Chandigarh also participated in the workshop.



Awareness Programmes for Disaster Managers and Media on Flash Flood Guidance Services at Delhi on 9th August, 2023

Shri S. C. Bhan, Sc.-G, Shri Rahul Saxena, Sc.-F, Dr. A. K. Das, Sc.-E, Dr. (Ms.) Madhulatha Akkiseti, Sc.-D, Shri S. K. Manik, Sc.-D, Shri Asok Raja S. K., Sc.-D attended the "Awareness Programme for Disaster Managers and Media on Flash Flood Guidance Services" organized by IMD-WMO on 09 August, 2023.

Dr. G. K. Das, Sc.-E, Shri H. S. Pariya, Met-B and Shri Shubhendu Karmakar, Met. A attended M-SAR (Maritime Search and Rescue) workshop on 09th August, 2023 at Haldia. Dr. G. K. Das Sc.-E delivered lecture on "Tropical Cyclone Monitoring and Forecast".

Shri Rohit Thapliyal, Sc.-D attended a workshop on "Flash Flood Guidance services" on 10 and 11 August, 2023 at Chandigarh.

"AWS / ARG Calibration Techniques" Workshop organized by ICITC (ISSD) at the ISSD Conference Hall, DGM Building on 4 & 5 September, 2023 for RMC Kolkata region. The event commenced with an insightful introduction by Mr. Vivek Sinha Sc.-G. Dr. M. Mohapatra, DG IMD, delivered an inaugural speech. The event was attended by Dr. V. K. Soni, Sc.-F, Dr. Gajendra Kumar, Sc.-F, Dr. Manish Ranalkar, Sc.-F, Dr. Sankar Nath, Sc.-F, Mrs. Samanti Sarkar, Sc.-E and Dr. B. Sudarsan Patro, Sc.-D. The workshop was an enriching and informative event that brought together experts, researchers, and enthusiasts from the field of Automatic Weather Station (AWS) and Automatic Rain gauge (ARG) Instrumentation, its calibration techniques. The workshop featured distinguished keynote speakers who shared their expertise in AWS and ARG calibration. The "AWS / ARG Calibration Techniques" workshop not only enriched participants with knowledge. It served as a platform to discuss challenges, share insights, and explore new horizons in AWS and ARG calibration. Hands-on workshops and practical sessions allowed participants to gain practical experience in AWS and ARG calibration techniques. Participants had the opportunity to work with real instrumentation and learn about calibration best practices.



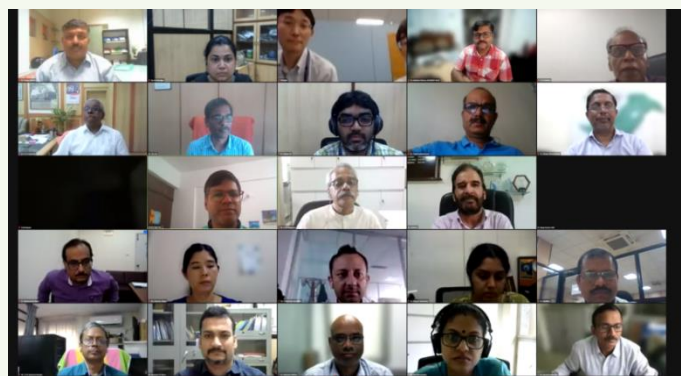
"AWS / ARG Calibration Techniques" Workshop organized by ICITC (ISSD) at New Delhi

Shri Raja Acharya, Met-B, participated as an observer in the Thirtieth Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS-XXX), held online during 11-15 September 2023 organised by the intergovernmental Oceanographic Commission

Shri Raja Acharya, Met-B, participated in the WMO Virtual Workshop on Environmental Sustainability of Observing Systems and Methods held during 12-13th September, 2023.

Dr. (Smt.) Manorama Mohanty, Sc.-E and Shri Kirit G. Kacha, Met-B attended a awareness session regarding "Weather Forecasting & Price Risk Management" of NCDEX in collaboration with IMD at Rajkot on 12th September & at Mehsana on 14th September, 2023.

South Asia Climate Outlook Forum (SASCOF Activity)



SASCOF26 Online Session

Twenty-sixth Session of South Asian Climate Outlook Forum (SASCOF-26) and Climate Services User Forum (CSUF) conducted

on 26-27 September, 2023. The aim of the workshop was to prepare the Consensus Outlook for 2023 winter season covering the months from October to December. The Climate Services User Forum (CSUF) which conducted on the 3rd of October, 2023 had focus on interface with users from the various application sectors to interpret seasonal climate information and understand their specific needs with a view to further customizing climate information.

Dr. Kripan Ghosh, Sc.-F and **Dr. Ashutosh Kumar Misra, Sc.- D** attended “**26th session of South Asian Climate outlook Forum (SASCOF-26)**” conducted by CR&S, IMD, Pune in collaboration with RIMES and UK Met office during 26-27 September, 2023.

Dr. Kripan Ghosh, Head Agrimet Division, attended brainstorming workshop on “Reorienting Education and Research in Agricultural Meteorology for Efficient Agromet Advisory Services and Climate Resilient Agriculture” jointly organised by Association of Agrometeorologists (AAM), Anand and ICAR-CRIDA, Hyderabad during 28-29 September, 2023.

MEETINGS / CONFERENCES

Shri Raja Acharya, Met-B, participated virtually in the webinar “**Militarization of Space and its implications**” on 22nd July, 2023 organised by the Astronautical Society of India, Department of Space Govt of India as a part of Azadi ka Amrit Mahotsab celebrations.

Dr. M. Mohapatra, DG, IMD participated in the online meeting of the Indian National Decade Coordination Committee at INCOIS on 6th July, 2023.

Dr. M. Mohapatra, DG, IMD participated in the meeting of the Joint Hindi Advisory Committee of Ministries of Science & Technology and Earth Sciences, in Delhi on 7th July, 2023.

Dr. M. Mohapatra, DG, IMD participated in the meeting of the National Coordination Committee for Polar Science Program (NCP) under the Chairmanship of Secretary, MoES at Prithvi Bhavan, New Delhi on 10th July, 2023.

Dr. Kripan Ghosh, Sc.-F, attended the “**14th meeting of Project Monitoring and Advisory Committee (PMAC) of IMD**” to monitor the periodic progress of the projects under ACROSS-IMD and to suggest suitable remedial measures for successful implementation of the activities on 11th July, 2023.

Dr. R. K. Jenamani, Sc. ‘G’, Attended the coordination meeting on 13th July, 2023 called by Delhi Disaster Management Authority (DDMA) and chaired by **Hon’ble LG of Delhi, Shri V. K. Saxena**, to “**Review the flood situation in Delhi**” and presented “**Heavy rainfall of 8-9 July, 2023 and forecast for Delhi**”. And also attended the coordination meeting on 14th July, 2023 called by Ministry of Home and chaired by Home secretary and presented on “**Extremely Heavy rainfall Event over Western Himalayan region and adjoining plains of northwest India including over HP and Delhi during 8-13 July, 2023 and forecast for 14-18 July, 2023**”. It was attended by CWC and other central and state authority.

Shri Abhimanyu Chauhan, Sc-C attended a meeting on discussion of Project RFP, document condition bids eligibility evaluation criteria & Project Implementation Procedure for use of satellite images in agriculture at Sachivalay, Gandhinagar on 15th July, 2023.

Dr. M. Mohapatra, DG, IMD participated in the Farmers’ Awareness Programme on “**Self Reliant Farmers : Empowering farmers through Agrometeorological Advisory Services in Changing Climate**” jointly organized by MoES, India Meteorological Department, Association of Agrometeorologists, State Agriculture Department and Centre for Earth Sciences & Himalayan Studies, Department of Science & Technology, and Krishi Vigyan Kendra, Papumpare at Itanagar during 13-14 July, 2023.

IMD officers **Shri Thangjalal Lhovum**, Sc.-D and **Shri Arun Kumar V. H.**, Sc.-C attended the one day “**Consultation Meeting on Early Warning Dissemination**” with participation from SDMA officers and DDMOs of all districts in Meghalaya along with Agriculture and Health officers on 14th July, 2023. The officers presented about IMD observational and forecasting activities and briefing about routine, special and impact based (IBF) bulletins issued for Meghalaya and Shillong city (Photo as Annexure-E).



IMD and Meghalaya SDMA one day “Consultation Meeting on Early Warning Dissemination” At SEOC, Shillong

Dr. M. Mohapatra, DG, IMD participated in the Weather and Climate Science for Service Partnership (WCSSP) India Executive Committee (EC) Meeting through VC on 18th July, 2023.

Dr. (Smt) Manorama Mohanty, Sc.-E attended the Weather Watch Group Meeting with State govt. officials headed by the Relief Commissioner, Govt. of Gujarat at State Emergency Operation Centre, Gandhinagar on 4th, 18th & 25th July, 2023.

Dr. A. Sandeep, Sc.-C was on tour to Itanagar to attend the meeting with Director-In - Charge of CEHS, AAI, SDMA and to participate in Farmer awareness programme during the period 12-17 July, 2023.

Shri Abhimanyu Chauhan, Sc.-C attended a meeting (Online Mode) with Delhi HQ on Urban Meteorological Services Phase IV headed by **V. K. Soni (UMS)** on 14th July, 2023.

Dr. Kuldeep srivastava, Sc.-F (ISSD), **Dr. Sankar Nath**, Sc-F (ISSD) and **Dr. A. K. Mitra**, Sc-F (Sat Met) attended SATCOM

Stakeholders "Open House" on 17th July, 2023 organized by Telecommunication Engineering Centre (TEC), Dept. of Telecommunications at Janpath, New Delhi. The agenda was Mobile Satellite Services (MSS), Low bit rate Satellite Communications, Terrestrial & Non Terrestrial Network Integration.

WMO/ESCAP Panel on Tropical Cyclones is celebrating its 50th Anniversary. To commemorate the event first meeting with experts from WMO, ESCAP and PTC Members was held under the chairmanship of **Dr. M. Mohapatra**, DG, IMD on 20th July, 2023.

Shri S. C. Bhan, Sc.-G attended the Launch event of "India Climate & Energy Dashboard (ICED)" and "India Energy Security Scenarios (IESS) 2047" organised by Niti Aayog on 20th July, 2023 at Akashvani Bhawan, New Delhi.

Dr. M. Mohapatra, DG, IMD participated in the Launch of the Weather Information Network Data Systems (WINDS) Portal at Shangri-La Eros, 19, Ashoka Road, New Delhi on 21st July, 2023. The meeting was presided by **Hon'ble Minister of Agriculture & Farmers Welfare**.

Dr. M. Mohapatra, DG, IMD participated in the meeting regarding concept paper on cloud burst prediction, observation system strengthening and possibility of Doppler radar alarms along major river basins at the Chamber of Hon'ble MoES on 24th July, 2023.

Dr. Sanjeev Dwivedi, Sc.-C, attended the meeting of State level Advisory Committee (STAC) under PMFBY under the chairmanship of the Principal Secretary to Govt. Agriculture & FE Deptt. Odisha dated 24th July, 2023.

Dr. M. Mohapatra, DG, IMD participated in the meeting with SAC Ahmedabad regarding Nowcast on 28th July, 2023.

Dr. D. S. Pai, Sc. 'G' and **Dr. D. R. Pattanaik**, Sc. 'F' attended the NWP review meeting held on 26th July, 2023 at MoES, New Delhi, chaired by **Dr. M. Ravichandran**, Secretary, MoES.

Dr. Sanjeev Dwivedi, Sc.-C, attended the meeting of Crop watch group for drought management (CWWGDM) under the chairmanship of Joint Secretary (Drought Management) Deptt. of Agriculture & Farmers Welfare, Govt. of India dated 27th July, 2023.

Dr. H. R. Biswas, Sc.-F, MC Bhubaneswar attended 32nd Regional Coordination Committee (R.C.C.) meeting of Deltaic Regional Centre, Kakinada on 3rd August, 2023 at Indian Institute of Water Management (IIWM), Bhubaneswar, Odisha conducted by National Institute of Hydrology, Roorkee.

Shri Raja Acharya, Met-B, participated in the webinar "DERCON training-Springer and Nature Journals" on 8th August, 2023 organised by the DGM Office New Delhi (IS & KRDD/Publication).

Dr. Kuldeep Srivastava, Sc.-F (ISSD) attended meeting of Geospatial Information Sectional Committee, LITD through online mode on 9th August, 2023.

A meeting to discuss the latest progress made on the **MoU signed between IMD and Grid Controller of India Ltd.** was held under the chairmanship of DGM on 10th August, 2023. A presentation on Load forecasting of Northern Region, which employs Recurrent Neural Networks (RNN) as a soft computing technique for forecasting load was delivered.

Shri Bikram Singh, Sc.-F attended a meeting on 16th August, 2023 under the chairmanship of Secretary, Department of Civil Aviation, Govt. of Uttarakhand regarding Aviation Met. Services at Heliport at Kedarnath Ji valley. The MoU regarding providing the Aviation Met. Services at Kedarnath Ji valley heliport is under process between IMD & the UCADA, Govt. of Uttarakhand.

Shri Umashankar Das, Sc.-C attended the Meeting of Crop Weather Watch Group for Drought Management (CWWGDM) held on 16th August, 2023 under the Chairmanship of Additional Secretary and CDRC, Department of Agriculture and Farmers Welfare, Govt. of India through video conference (Webex).

Shri H. S. Sawhney, Sc.-E attended a Talk on "Power Enhancement in Renewable Energy Sources through Power Electronic Interfaces" organised by the Indian Science Technology and Engineering facilities Map (I-STEM) on 17th August, 2023.

Dr. M. Mohapatra, DG, IMD chaired the meeting of the Task Group to review Meteorological payloads of INSAT-4th Generation through VC on 19th August, 2023.

Dr. M. Mohapatra, DG, IMD participated in the meeting under the chairmanship of Hon'ble Minister of Earth Sciences regarding research action plans of each institution of MoES on 21st August, 2023.

Dr. M. Mohapatra, DG, IMD participated in the Inaugural Session of the 8th National Conference of the Ocean Society of India at INCOIS, Hyderabad on 23rd August, 2023 through VC in connection with inauguration of WMO Regional Specialised Meteorological Centre (RSMC) for global and regional ocean modeling at INCOIS.

Dr. H. R. Biswas, Sc.-F attended Crop Weather Watch Group for Drought Management (CWWGDM) CWWG held on 24th August, 2023 (Thursday) under the Chairmanship of Additional Secretary and CDRC, Department of Agriculture and Farmers Welfare, Govt. of India through video conference (Webex).

Dr. Ashok Kr. Das, Sc.-E attended 6th RA II Hydrological Advisories Forum meeting through VC on 24th August, 2023.

Shri Raja Acharya, Met-B, participated in the webinar "DERCON Training- Elsevier Training on Scopus and Science Direct" on 24th August, 2023 organised by the DGM Office New Delhi (IS & KRDD/Publication).

Dr. M. Mohapatra, DG, IMD had meeting with **Shri G. S. Naveen Kumar**, Relief Commissioner, Disaster Management, UP regarding installation of RADAR at UP on 25th August, 2023.

National framework of Climate Services (NFCS) Pre-preparatory meeting at Christ University, Lavasa on 25th August, 2023, was attended by **Dr. Satyaban B. Ratna**, Sc.-E, **Ms. Arti Bandgar**, Sc.-D, **Dr. Sudeep Kumar**, Sc.-C, **Mr. Jose Samuel**, Met.-B and **Mr. Sanjay Raskar**, Met.-A.

Shri S. C. Bhan, Sc-G, IMD participated in the meeting to review prospects of Kharif Production under the Chairmanship of Secretary, Department of Agriculture and Farmers Welfare (DA&FW) at Krishi Bhawan on 28th August, 2023.

Dr. M. Mohapatra, DG, IMD participated in the meeting with **Ms. Swati Pandey**, Vice Chairman & Managing Director, Maharashtra Airport Development Company Limited (MADC) on 29th August, 2023.

Mr. Uday K. Shende, Sc.-E has attended an online meeting as an external member of the expert committee for discussion of faulty sensor's repairing/replacement cited in 72 m tower lab at IITM, ART Bhopal on 29th August, 2023.

Dr. M. Mohapatra, DG, IMD and **Mr. Gajendra Kumar**, Sc-F participated in the meeting with **Dr. Bhagwat Kishanrao Karad**, **Hon'ble MoS for Finance** on 30th August, 2023 in connection with installation of radar in Aurangabad.

Dr. M. Mohapatra, DG, IMD and **Dr. Soma Senroy**, Sc. -F, **Dr. Trisanu Banik**, Sc-C participated in the scientific brainstorming meeting to assess the performance of the Lightning Location Network (LLN) installed by the Indian Institute of Tropical Meteorology (IITM) Pune at MoES on 30th August, 2023.

Dr. M. Mohapatra, DG, IMD had meeting with the delegation from Malawi, Africa on 30th August, 2023. The team also visited various workstations of IMD.

Dr. M. Mohapatra, DG, IMD was felicitated during 11th Meeting of the IMS National Council at DGM's Conference Hall on 31st August, 2023.

Mr. Uday K. Shende, Sc.-E has attended an online meeting as a chairman of the DWR Radar installation committee to finalize the site selection at Durga Tekdi, Pune on 31st August, 2023.

Dr. S.O' Shaw, Sc.-F, visited Itanagar on 4th September, 2023 to attend 81st meeting of Brahmaputra Board.

Dr. Ashok Kumar Das, Sc.-E, Member and **Shri Swapan Kumar Manik**, Sc.-D, Alternate Member attended the First Meeting of the Committee for Joint Flood Management study of river Yamuna for its reach between Hathinikund and Okhla barrage on 4th September, 2023 in the Chairman Committee Room, Central Water Commission, Sewa Bhawan, R. K. Puram, New Delhi.

Dr. D. R. Pattanaik, Sc.-F and **Mrs. Monica Sharma**, Sc.-D had an online meeting with **Shri Harsh Gupta**, JS NDMA to demonstrate the modeling capabilities of IMD on 5th September, 2023.

Dr. M. Mohapatra and senior scientists of IMD had meeting with DG, Solar Energy Society of India for forecast extension to solar energy industries and implementation of solar energy in IMD on 12th September, 2023.

Team from RMSI, NDMA and IMD had a meeting on transfer of technological know-how of the Web DCRA System under NCRMP Project of NDMA on 12th September, 2023.

A meeting was organised with **Solar Energy Society of India (SESI)** under the chairmanship of DGM on 12th September, 2023 to discuss the collaborative efforts in the field of solar energy.

Dr. Ashok Kumar Das, Sc.-E attended the 4th Project Steering Committee meeting of Central Water Commission for assessment of Water Resources Potential of India on 12th September, 2023 on hybrid mode.

Dr. Kuldeep Srivastava, Sc.-F (ISSD) attended meeting with delegation of Regional Integrated Multi-hazard Early Warning Systems for Africa and Asia (RIMES) during the period of 12-15 September, 2023.

Shri S. C. Bhan, Sc.-G, Head Hydromet and **Shri S. K. Manik**, Sc.-D attended the "International Conference on Dam Safety" from 14-15 September, 2023 at Jaipur, Rajasthan.

Dr. G. N. Raha, Sc.-E, M. C. Gangtok attended the "Interface meeting on State level Climate Information Services on 18th September, 2023" conducted by SEEDS Technical service Ltd. & UNDP at Chintan Bhawan Gangtok, Sikkim.

Shri Vivek Sinha, Sc.-G attended 19th Meeting of CGPB Committee-XI (Geoinformatics and Data Management) on 15th September, 2023 through online mode.

Mr. Uday K. Shende, Sc.- E has attended an online meeting as a SAT committee member visited helipad stations cited in Naharlung and Kohima from 17- 24 September, 2023.

Dr. M. Mohapatra, DG IMD had meeting regarding collaboration with Startups for the development of various Met. sensors, application products on 20-21 September, 2023.

Dr. Praveen Kumar, Sc.-C attended the meeting on 23rd September, 2023 with **Deputy CM of Maharashtra**, Nagpur Municipal Commissioner, Collector of Nagpur and other officers from different department for briefing the Intense spell of rainfall over Nagpur.

Shri M. L. Sahu, Sc.-F and **Dr. Praveen Kumar**, Sc.-C, attended the meeting with Nagpur's Collector and Agriculture officers of the district for weather briefing on 25th September, 2023.

Dr. M. Mohapatra participated as external examiner for Ph. D Viva Voce Examination of **Mr. Ashutosh Kumar Sinha** organised by the Department of Environmental Science. Central University of South Bihar on 27th September, 2023.

Dr. M. Mohapatra, DG IMD had a meeting regarding Harvard Climate Platform Collaboration Exploratorion Call through Webex on 27th September, 2023.

Dr. Ashok Kumar Das, Sc.-E attended the 5th Project Steering Committee meeting of Central Water Commission for assessment of Water Resources Potential of India on 27th September, 2023 on hybrid mode.

Dr. M. Mohapatra, DG IMD participated in the 19th Formation Day of NDMA on the theme : A Vision for Disaster Mitigation on 28th September, 2023.

LECTURES/ TALK

Dr. S. Bandyopadhyay, Sc.-G, delivered a lecture during a training program on Earth Observation Data Analytics for Disaster Management focusing on flood and drought at Indian Statistical Institute, Kolkata on 11th July, 2023.

Dr. H. R. Biswas, Sc.-F, M.C. Bhubaneswar delivered lecture on heat risk faced by Bhubaneswar, planned and ongoing strategies for heat adaptation in the city held on 2nd August, 2023 conducted by School of Environment and Sustainability at IHS.

Dr. S. Bandyopadhyay, Sc.-G delivered a talk at Calcutta Electric Supply Corporation on 3rd August, 2023.

Dr. M. Mohapatra, DG, IMD delivered a recorded speech as an invited Speaker during the Plenary Session of the launch event of CEEW's report on **"Strengthening India's Disaster preparedness with Technology : A Case for Effective Early Warning Systems"** at India Habitat Centre, New Delhi on 13th July, 2023.

Dr. Kripan Ghosh, Sc.-F, **Dr. Ashutosh Kumar Misra**, Sc.-D and **Dr. Asha Latwal**, Sc.-C attended an online talk on **"Evolution of cyclone monitoring and forecasting over the North Indian Ocean"** by **Dr. M. Mohapatra**, DG, IMD, New Delhi **"Commemorating 50th year of WMO/ESCAP Panel on Tropical Cyclones"** on 7th August, 2023.

Dr. Kripan Ghosh, Head Agrimet Division, delivered an invited lecture on **"Weather and climate services for the agriculture sector"** through virtual mode on 21st August, 2023 in the training programme on **"Sustainable Agricultural Water Management Options Under Changing Climate"** organised by ICAR-Indian Institute of Water Management, Bhubaneswar in collaboration with National Institute of Agricultural Extension Management, Hyderabad.

Dr. Asha Latwal, Sc.-C delivered an invited lecture on **"Climate Change: Causes, Adaptation and Mitigation"** through virtual mode on 22nd August, 2023 in the training programme on **"Sustainable Agricultural Water Management Options Under Changing Climate"** organised by ICAR-Indian Institute of Water Management, Bhubaneswar in collaboration with National Institute of Agricultural Extension Management, Hyderabad.

Dr. S. Bandyopadhyay, Sc.-G, delivered lecture in the workshop on **"Unleashing Earth Observation Insights for Flood and Drought Management : Data to Build Resilience"** at ISI, Kolkata on 15th September, 2009.

Dr. (Smt) Manorama Mohanty, Sc.-E delivered a lecture on **"Weather Forecasting and Weather Services"** at Indian Institute of Public Health (IIPH), Gandhinagar on 31st August, 2023 and on **'Climate Change: Crisis on Infinite Earth'** at Junagarh Agriculture University on 22nd September, 2023.



Dr. (Smt.) Manorama Mohanty, Sc.-E delivered a lecture

Dr. M. Mohapatra, DG IMD presented a Memorial Lecture in the Webinar on Late Professor G. P. Sinha Memorial on **"Climate Change: It's Impact & Solutions"** on 1st September, 2023.

Dr. H. R. Biswas, Sc.-F, M.C. Bhubaneswar attended as Chief Guest and delivered lecture in the community training programme for fishermen organised by **"SPANDAN"** Puri, Odisha on 1st September, 2023.

Four-weeks summer placement course has been organized by Agrimet Division, IMD, Pune during 4-28 September, 2023. B.Tech (Agril. Engineering) students from various universities of Maharashtra has participated in the said course. Scientists of the division delivered lectures on following topics during the course:

'Agromet Advisory services' - by Dr. Kripan Ghosh, Head, Agrimet Division and Dr. Asha Latwal, Sc.-C.

'Introduction to Agricultural Meteorology', 'Crop weather relationship', Application of Weather forecasting to Agriculture and 'Basics of Crop weather modelling' - by Dr. Ashutosh Kumar Misra, Sc.- D. **'Evaporation and Evapotranspiration'** and **'Basics of Remote Sensing and its applications in Agriculture'** - by Dr. Asha Latwal, Sc.-C.

Dr. H. R. Biswas, Sc.-F, M.C. Bhubaneswar delivered lecture on Cyclone Early Warning system on 8th September, 2023 for Odisha Administrative Services probationer's 2020 batch at Gopabandhu Academy of Administration (GAA) Bhubaneswar.

Dr. M. Mohapatra, DG IMD delivered **Dr. M. K. Rout** Memorial Lecture at Bhubaneswar which was organized by State Pollution Control Board, Odisha on 12th September, 2023.

Dr. Ashutosh Kumar Misra, Sc.-D delivered a lecture on “**IMD services for the farming community of the country**” to the M.Sc. (Agri.) students and faculty members of Anand Agricultural University, Gujarat on 12th September, 2023.

Special lecture was delivered by Dr. Taiichi Hayashi, Professor in the Centre for South East Asian Studies, Network division, Kyoto University Japan on the topic of “**Why we are interested in heavy rainfall in the north Eastern India**”? at RMC Guwahati office on 12th September, 2023.

Special lecture was delivered by Dr. Toru Terao, Professor, Faculty of Education in Kagawa University, Japan on the topic of “**Summer Monsoon Onset and Lower Tropospheric High Moist Static Energy Airmass**” at RMC Guwahati office on 22nd September, 2023.

PRESENTATIONS

A presentation of Integration of **Biometric Attendance System** with METNET was given to Head of the Section of Delhi Offices by **Shri Parmod Kumar**, Sc.-C on 5th July, 2023 in the presence of DGM and DDGA.

Dr. Ashok Kr. Das, Sc.-E attended the 14th PMAC meeting through VC on 11th July, 2023 and made a presentation on the status of the project ‘**Upgradation of Hydromet Services**’.

Dr. Suprit Kumar, Sc.-E, MO Port Blair gave a presentation on a Seminar on Climate Change and Sustainable development (an event to commemorate India’s G20 presidency) organized by Prasar Bharti/Akashvani at DBRAIT, Port Blair on 22nd August, 2023.

On behalf of MoES, the officers and staff members of RMC Kolkata participated in “**26th National Science Exhibition on the theme of ‘Contribution to make advances, powerful and great India**” from 24-27 August, 2023 at Central Park Maidan, Kolkata organized by Central Calcutta Science and Culture Organisation for Youth, ‘**Ananda Bhaban**’. Various meteorological instruments, charts, MoES flexes were displayed, briefed about meteorological observation and its importance for weather forecasting.



Student and other visitors visiting MoES Stall during 26th National Science Exhibition from 24 -27 August, 2023

FOREIGN DEPUTATION

Dr. Anoop Kumar Mishra, Sc.-C, IMD New Delhi was on deputation to attend the ICAO Asia and Pacific (APAC) Twenty-Seventh Meeting of the Meteorology SubGroup (MET SG/27) will be held at Bangkok, Thailand from 04-08 September, 2023.

Dr. D. S. Pai, Sc.-G, IMD New Delhi was on deputation to attend 4th Leadership and Management Programme for Senior Management of National Meteorological and Hydrological Services (NMHSs) will be held at Singapore from 4-8 September, 2023.

TRAININGS

The following training courses are imparted to IMD officials and also to Officers from other departments on regular basis under Capacity Building.

- Advanced Meteorological Training Course (AMTC)
- Forecasters’ Training Course (FTC)
- Integrated Met Training Course (IMTC)
- Direct Recruited Scientists Training Course (DRSTC)
- Modular Training Course (MTC)

Six (06) officers attended refresher course on “**Upper Air Instruments and Radars**” from 17-21 July, 2023 organised by ICITC, ISSD, New Delhi

12 officers attended refresher course on “**Airport Meteorological Instruments**” from 21-25 August, 2023 organised by ICITC, ISSD, New Delhi.

One day training on use of Gravimetric Equipment was organized at Regional Meteorological Centre Guwahati on 4th August, 2023.

HRC has conducted an online e-learning course entitled, “**FGS System Administration**” on 25th August, 2023, **Mr. Rahul Saxena**, Sc.-F, **Dr. Ashok Kumar Das**, Sc.-E, **Madhu Iatha Akkiseti**, Sc.-D, **Davinder Sharma**, Met-A, **Yashika Garg**, Met-A, **Rajeev Ranjan**, Met-A attended this course.

Four-weeks **summer placement course** organized by Agrimet Division, IMD, Pune for B.Tech (Agril. Engineering) students during 4-28 September, 2023.



B.Tech (Agril. Engineering) students

Visitors

Wing Commander Shri Pranjal Deka (I.A.F.) visited M. O. Tezpur on 12th July, 2023.

Shri Rongsenlemzung, Joint Director Department of Soil & Water Conservation Kohima Nagaland, visited RMC Guwahati on 14th August, 2023.

Students of Lamdon Model School and Ladakh Science Foundation Visits Meteorological Centre Leh : In a significant effort to nurture scientific curiosity and understanding among young minds, Lamdon Model School, in collaboration with the Ladakh Science Foundation, organized a highly enlightening visit to the country's highest Meteorological Centre at Leh-Ladakh. This visit, which took place on 23rd and 24th August, 2023, aimed to introduce students to the fascinating world of weather science and the crucial role that IMD plays in forecasting weather for India. **Shri Sonam Lotus**, Sc.-E and **Dr. Jigmat Stodius**, S.A, briefed the students.



Students of Lamdon Model School and Ladakh Science Foundation Visits Meteorological Centre Leh

Mr. Martin Gazak of Micro Step MIS, Slovakia alongwith **H.E. Mr. Robert Maxin**, Ambassador and **Mr. Patrick Lista**, Economic Diplomat, from Slovak Embassy in Delhi visited IMD on 30th August, 2023.

22 Students and 4 Teachers, Dept. of Physics, UCC Barapani College visit at MC Shillong on 22nd September, 2023.



Student & Teacher of UCC Barapani College visited at MC Shillong

60 students and 2 Professors of GHRCE, Nagpur visited MC Nagpur on 25th September, 2023.

20 Students and 2 Teachers, Deptt. of Geography, Morigaon College visited at MC Shillong on 29th September, 2023.



Students and Teachers, Dept. of Geography, Morigaon College visited at MC Shillong

A team of delegates from National Institute of Malaria Research (ICMR) and a group of trainees (State Officials) from Gujarat Institute of Disaster Management (GIDM) visited the Met Centre, Ahmedabad on date: 29th August, 2023.



A team of delegates from National Institute of Malaria Research (ICMR)



A group of trainees (State Officials) from Gujarat Institute of Disaster Management

Students and teachers from **Doon Business School, Dehradun** and **Himalayan Institute of Medical Science, Dehradun** were visited Meteorological Centre Dehradun premises on 7th July, 26th July, 31st August and 26th September, 2023 respectively. **Shri Rohit Thapliyal**, Sc.-D delivered a lecture on "Different

Weather Forecasting Products and Climate Services” being provided by MC Dehradun. **Shri Shambhu Sharan**, Met-B, **Shri Akash Chandra**, Met-A, **Shri Ankit Sharma**, Met-A and **Shri Bhaumik Indrawal**, Met-A, Met. Centre Dehradun briefed the students about RS/RW observation, surface met. observatory and showed the activities of weather forecasting section.



Students of various colleges visited MC Dehradun

Officials of NERLDC visited RMC Guwahati office for a meeting dated 12th September, 2023 related to installation of AWS/ARG in various stations in NE- Region.

Group Captain Vinila Vertma, Command Meteorological Offices HQ Eastern Air Command, IAF Shillong, visited M.O Sohra on 14th September, 2023.

About **111 visitors** including students of East Point School, Vasundhara Enclave, Sanskriti School, Chanakya Puri, New Delhi, trainees from Indian Coast Guard, Indian Navy and Mauritius Meteorological Department, trainees of FTC Training batch no. 196 and Students from Dayal Singh College visited the Central Hydromet Observatory from 1st July, 2023 to 30th September, 2023.



Trainees from Indian Coast Guard, Indian Navy and Mauritius Meteorological Department



East Point School, Vasundhara Enclave

ACHIEVEMENTS/APPRECIATIONS/AWARDS RECEIVED



Dr. M. Mohapatra was felicitated by the SECI

Dr. M. Mohapatra, DG, IMD participated as Chief Guest during the National Student Convention 2023 on Solar Energy in association with Solar Energy Society of India on 22nd August, 2023. **Dr. M. Mohapatra** was felicitated by the SECI during the event for his exemplary contribution to Society through Early Warning Services 'Anticipating Adversity, Protecting Lives'.

MC Ahamadabad received **Appreciation letter** from DGM New Delhi for providing the accurate and precise forecast services during “**BIPORJOY CYCLONE**”.



IMS Bhubaneswar felicitated Dr. M. Mohapatra on his election as 3rd Vice President of WMO

राजभाषा अनुभाग

राजभाषायी निरीक्षण

माननीय संसदीय राजभाषा समिति की दूसरी उपसमिति द्वारा दिनांक १० जुलाई, 2023 को विमानन मौसम केंद्र-अहमदाबाद तथा मौसम कार्यालय-राजकोट का अहमदाबाद में निरीक्षण किया गया। निरीक्षण के दौरान मुख्यालय से उपमहानिदेशक (प्रशा.)/ वैज्ञानिक 'जी' श्रीमती रंजू मदान तथा उपनिदेशक (राजभाषा) श्रीमती सरिता जोशी उपस्थित रहे। दोनों निरीक्षण सफल रहे।



उपमहानिदेशक (प्रशा.)/ वैज्ञानिक 'जी' श्रीमती रंजू मदान तथा उपनिदेशक (राजभाषा) श्रीमती सरिता जोशी

माननीय संसदीय राजभाषा समिति की दूसरी उपसमिति द्वारा दिनांक १२ जुलाई, 2023 को मौसम विज्ञान वेधशाला- मंगलुरू तथा मौसम विज्ञान वेधशाला- कोषिकोड का बंगलुरू में निरीक्षण किया गया। निरीक्षण कार्यक्रम में सहयोग के लिए मुख्यालय से उपनिदेशक(राजभाषा) श्रीमती सरिता जोशी तथा वरिष्ठ अनुवाद अधिकारी श्री बीरेंद्र कुमार उपस्थित रहे। दोनों निरीक्षण सफल रहे।



माननीय संसदीय राजभाषा समिति की दूसरी उपसमिति द्वारा मौसम विज्ञान वेधशाला - मंगलुरू तथा मौसम विज्ञान वेधशाला- कोषिकोड का बंगलुरू में निरीक्षण किया गया

माननीय संसदीय राजभाषा समिति की दूसरी उपसमिति द्वारा दिनांक 21 अगस्त, 2023 को मौसम केंद्र-हैदराबाद का विजयवाड़ा में और दिनांक 24 अगस्त, 2023 को चक्रवात चेतावनी केंद्र-विशाखापट्टनम का विशाखापट्टनम में निरीक्षण किया गया। मौसम केंद्र-हैदराबाद के निरीक्षण में मुख्यालय से श्री विवेक सिन्हा, वैज्ञानिक-जी' और श्रीमती सरिता जोशी, उपनिदेशक (रा.भा.) ने भाग लिया तथा चक्रवात चेतावनी केंद्र- विशाखापट्टनम के निरीक्षण में मुख्यालय से श्रीमती रंजू मदान, उपमहानिदेशक (प्रशासन)/वैज्ञानिक 'जी' और श्रीमती सरिता जोशी, उपनिदेशक (रा.भा.) ने भाग लिया। श्री सचिन कादयान, कनिष्ठ अनुवाद अधिकारी सहयोग के लिए उपस्थित रहे। दोनों निरीक्षण सफल रहे।



The Climate Research Centre, Pune also felicitated Dr. Mohapatra on his election to the post of 3rd Vice President of WMO

Mrs. Latha Sridhar, Met-B, RMC Nagpur completed Ph.D. synopsis presentation on "Analysis of Rainfall Characteristics and Extreme Rainfall Events over India at different Spatial and Temporal Scales".

Ms. Apoorva Singhroul, Met-A, Mr. Ajay Kumar Rai, S.A., MC Sagar and Mr. Mukul Tripathi, S.A. M.C. Jabalpur were awarded for their best articles/poem for the ninth issue of hindi magazine Riturang.

Hindi Protsahan Yojana 2022-2023, Winners

1. Mrs. Sulekha Sonal, S.A., Mr. S.A. Pawar, Assistant and Mrs. Pushpa Sawarakar, UDC - 2nd Prize.
2. Mrs. Reena V. Surpam, Met- A, 3rd Prize.



Hindi Pakhwada Celebration (RMC Nagpur) 1-14, September, 2023



On behalf of MoES the Officers of IMD(RMC Kolkata) receiving certificate and memento for participation in 26th National Science Exhibition



मौसम केंद्र- हैदराबाद के निरीक्षण में मुख्यालय से श्री विवेक सिन्हा, वैज्ञानिक-जी' और श्रीमती सरिता जोशी, उपनिदेशक (रा.भा.) ने भाग लिया

हिंदी दिवस समारोह 2023

मुख्यालय में दिनांक 27 सितम्बर, 2023 हिंदी दिवस/हिंदी पखवाड़ा समापन समारोह 2023 का महानिदेशक महोदय की अध्यक्षता में आयोजन किया गया जिसमें मुख्य अतिथि के रूप में दिल्ली विश्वविद्यालय के वरिष्ठ प्रोफेसर पूरनचन्द टंडन उपस्थित रहे।



महानिदेशक महोदय ने मुख्य अतिथि दिल्ली विश्वविद्यालय के वरिष्ठ प्रोफेसर पूरनचन्द टंडन का स्वागत किया

पुरस्कार/सम्मान

मुख्यालय में हिंदी दिवस/हिंदी पखवाड़ा-2023 के दौरान आयोजित की गई 06 प्रतियोगिताओं के 30 विजेताओं को महानिदेशक महोदय डॉ. मृत्युंजय महापात्र एवं मुख्य अतिथि वरिष्ठ प्रो. पूरनचन्द टंडन जी तथा उपमहानिदेशक (प्रशा.) श्रीमती रंजू मदान के कर कमलों से पुरस्कार एवं प्रमाण पत्र प्रदान किए गए।



महानिदेशक महोदय द्वारा हिंदी दिवस के अवसर पर विजयी प्रतियोगी को पुरस्कार प्रदान किए गए

मुख्यालय में हिंदी दिवस समारोह दिनांक 27 सितम्बर, 2023 के अवसर पर राजभाषा हिंदी में सर्वश्रेष्ठ कार्य करने हेतु 'सूचना का अधिकार प्रकोष्ठ' को वर्ष 2022-2023 के लिए 'राजभाषा चलशील्ड' प्रदान की गई।



'राजभाषा चलशील्ड' प्रदान करते हुए

वर्ष 2022-2023 के लिए सरकारी कामकाज मूल रूप से हिंदी में करने की प्रोत्साहन योजना के अंतर्गत महानिदेशक महोदय द्वारा हिंदी दिवस के अवसर पर मुख्यालय में कार्यरत 06 कार्मिकों को प्रमाण-पत्र प्रदान किए गए।



प्रोत्साहन योजना के अंतर्गत महानिदेशक महोदय द्वारा हिंदी दिवस के अवसर पर मुख्यालय में कार्यरत कार्मिकों को प्रमाण-पत्र प्रदान किए गए

मौसम मंजूषा के 37^{वें} संस्करण का विमोचन हिंदी दिवस समारोह-2023 के अवसर पर महानिदेशक महोदय डॉ. मृत्युंजय महापात्र और मुख्य अतिथि वरिष्ठ प्रोफेसर पूरनचन्द टंडन जी द्वारा दिनांक 27 सितम्बर, 2023 को किया गया।



मौसम मंजूषा के 37^{वें} संस्करण का विमोचन

Research & Publications

Twenty Four (24) research articles have been published in **MAUSAM** (Vol. 74, No. 3), July, 2023 issue. Following are the research articles published in Mausam and other extra departmental journals which are authored by IMD officials:

R. Bhatla, Manas Pant, Soumik Ghosh, Shruti Verma, Nishant Pandey and Sanjay Bist, 2023, "**Variations in Indian Summer Monsoon Rainfall patterns in Changing Climate**", *MAUSAM*, 74, 3, 639-650, <https://doi.org/10.54302/mausam.v74i3.5940>.

Rohit Thapliyal and Bikram Singh, 2023, "**A case study of exceptionally heavy rainfall event over Uttarakhand, India on 18th October, 2021 and its forecasting**", *MAUSAM*, 74, 3, 717-740, <https://doi.org/10.54302/mausam.v74i3.4754>.

Amit Kumar, Neerja Sharma, Atul Kumar Varma & S. C. Bhan, 2023, "**Performance Evaluation of Hydro-Estimator Technique-Based Rain Products from INSAT-3DR During Indian Summer Monsoon 2020**", *Journal of the Indian Society of Remote Sensing* volume 51, pages1673–1681 (2023), <https://link.springer.com/article/10.1007/s12524-023-01723-y>.

Satya Prakash & M. Mohapatra, 2023, "**Mean rainfall characteristics of tropical cyclones over the North Indian Ocean using a merged satellite-gauge daily rainfall dataset**", *Natural Hazards* (Sept 2023), <https://link.springer.com/article/10.1007/s11069-023-06158-9>.

A. P. Ramaraj, K.P.C. Rao, G. Kishore Kumar, K. Ugalechumi, P. Sujatha, Suryachandra A. Rao, R.K. Dhulipala, A.M. Whitbread, 2023, "**Delivering context specific, climate informed agro-advisories at scale: A case study of iSAT, an ICT linked platform piloted with rainfed groundnut farmers in a semi-arid environment**", *Climate Services*, Volume 31, August 2023, 100403, <https://www.sciencedirect.com/science/article/pii/S2405880723000651?via%3Dihub>.

Radhika Kanase, Snehlata Tirkey, Medha Deshpande, R Phani Murali Krishna, C. J. Johny, P. Mukhopadhyay, Gopal Iyengar & M. Mohapatra, 2023, "**Evaluation of the Global Ensemble Forecast System (GEFS T1534) for the probabilistic prediction of cyclonic disturbances over the North Indian Ocean during 2020 and 2021**", *Journal of Earth System Science*, volume 132, Article number: 143 (2023), <https://link.springer.com/article/10.1007/s12040-023-02166-2>.

Susmitha Joseph, R. Chattopadhyay, A. K. Sahai, Gill M. Martin, Avijit Dey, Raju Mandal & R. Phani, 2023, "**Evaluation and comparison of the subseasonal prediction skill of Indian summer monsoon in IITM CFSv2 and UKMO GloSea5**", *Climate Dynamics*, volume 61, pages1683–1696 (2023), <https://link.springer.com/article/10.1007/s00382-022-06650-1>.

Pradeep Sharma & Soma Sen Roy, 2023, "**Hailstorms over India during the summer season**", *Meteorology and Atmospheric Physics* volume 135, Article number : 41 (2023), <https://link.springer.com/article/10.1007/s00703-023-00980-3>.

Raja Boragapu, Pulak Guhathakurta & O. P. Sreejith, 2023, "**Tropical cyclone vulnerability assessment for India**", *Natural Hazards*, volume 117, pages 3123-3143 (2023), <https://link.springer.com/article/10.1007/s11069-023-05980-5>.

Pravat R. Naskar, Gyan P Singh, Dushmanta R Pattanaik & Shobhit Katyar, 2023, "**CMIP6 projections of spatiotemporal changes in rainfall and droughts over India**", *Journal of Earth System Science*, volume 132, Article number: 123 (2023), <https://link.springer.com/article/10.1007/s12040-023-02143-9>.

Pallabi Saha, Gargi Rakshit, Animesh Maitra, 2023, "**Study of melting layer features related to atmospheric parameters over a tropical location**", *Advances in Space Research*, Volume 72, Issue 2, 15 July 2023, Pages 378-388, <https://doi.org/10.1016/j.asr.2023.03.013>.

Neeti Singh, Bipasha Paul Shukla, Nitesh Kaushik, A. K. Varma, A. K. Mitra, S. C. Bhan, 2023, "**Validation of INSAT-3D/3DR based nowcasting rain occurrences for heavy rainfall using Hydro-Estimator product**", *Advances in Space Research*, Volume 72, Issue 6, 15 September 2023, Pages 2185-2194, <https://doi.org/10.1016/j.asr.2023.05.030>.

P. S. Soyam, P. D. Safai, S. Mukherjee, S. Kondle, S. Bankar, K. Todekar, N. Malap, D. Surendran, A. Gaikwad, S. Lohogaonkar & T. Prabhakaran, 2023, "**Significant abundances of alkaline components in the fine and coarse aerosols over a tropical rain shadow location in peninsular India**", *Journal of Atmospheric Chemistry*, volume 80, pages191–209 (2023), <https://link.springer.com/article/10.1007/s10874-023-09447-6>.

Kavita Patnaik, Amit P. Kesarkar, Subhrajit Rath, Jyoti N. Bhate, Abhishek Panchal, Anantharaman Chandrasekar, Ramakumar Giri, 2023, "**A 1-D model to retrieve the vertical profiles of minor atmospheric constituents for cloud microphysical modeling: I. Formulation and validation**", *Science of The Total Environment*, Volume 881, 10 July 2023, 163360, <https://doi.org/10.1016/j.scitotenv.2023.163360>.

CDMS, CRS Pune prepared Aerodrome Climatological Summaries of the following airports for the period 2018-2022:

Swami Vivekanand Airport, Raipur
Mysore Airport
Maharana Pratap Airport, Dabok, Udaipur

Daily normals of global and diffuse radiation for the period 1991-2020 for 32 stations were published.

WMO publication "**State of the Climate in Asia 2022 (WMO-No. 1321)**" Contributing experts from CRS, IMD, Pune Dr. O. P. Sreejith, (lead Author) and Dr. Sabeerali C. T. published.

Shinto Roose, R. S. Ajayamohan, Pallav Ray, Shang-Ping Xie, C. T. Sabeerali, M. Mohapatra, S. Taraphdar, K. Mohanakumar and M. Rajeevan, "**Pacific decadal oscillation causes fewer near-equatorial cyclones in the North Indian Ocean**". *Nature Communications*, 14, 5099 (2023), DOI: <https://doi.org/10.1038/s41467-023-40642-x>

Dr. Sourish Bondyopadhyay, "Suitable thermodynamic indices for the prediction of thunderstorm events for different cities throughout India", "**Meteorology and Atmospheric Physics**" Reference: *Meteorol. Atmos. Phys.*, **135**, 48 (2023).

Outreach and Media Interaction

During the month of July-2023 under GKMS activities 674 nos. District level AAS Bulletins, **2980 nos. Block level AAS Bulletins Issued** and **3,45,000 nos. Meghdoot mobile apps downloaded. Through 17,478 Whats App groups, 16,04,901 farmers in 1,25,114 villages in 3,995 blocks** Advisories Disseminated to farmers. At state level the Agromet advisories disseminated in Madhya Pradesh 10,00,000 farmers, Tamil Nadu 10,00,000 farmers, Gujarat 36,00,000 farmers, Nagaland, 78,973 farmers, Chhattisgarh, 2,00,000 farmers, Haryana, approximately 3,61,000 farmers, Rajasthan 10000 farmers, Odisha 7,000 farmers, Meghalaya approximately 250000 farmers, Bihar Approximately 8,37,000 farmers and in Kerala Appr Impact based forecast (IBF) for Agriculture (Heavy Rainfall) and Agromet Advisories based on the IBF have been issued for different districts of various States and UTs across the country in co-ordination with NWFC, New Delhi, RMCs/MCs, AMFUs and DAMUs during the quarter.

During the quarter 79 Farmers awareness programmes (FAPs) were organized by AMFUs and DAMUs across the country.



FAP conducted by DAMU, Baghat at Gothra Village, Baghat District, Uttar Pradesh on 19th July 2023

Dr. M. Mohapatra, DG, IMD participated as Expert Speaker in the Live Show "**3 July, 2023 - the hottest day**" on DD News on 5th July, 2023.

On self Reliant Farmer's **Empowering Farmer's through Agro-Meteorological Advisory Service** in Changing Climate was jointly organized by Ministry of Earth Sciences (MoES) India Meteorological department and Centre for Earth Sciences & Himalayan Studies, Science & Technology, and KVK Papumpare at DK Hall Itanagar (Arunachal Pradesh) on 14th July, 2023.

Dr. M. Mohapatra, DG, IMD participated in the meeting with World Bank officials led by Ms. Yeshika regarding Web-DCRA activity at IMD on 28th July, 2023.

A video film on **Cyclone Warning And Management In India: An End To End System** was released by HMoES on the occasion of Foundation Day of MoES on 27th July, 2023.

Dr. M. Mohapatra, DG, IMD participated in the interview by **Mr. Rachel Dobbs** of The Economist regarding the monsoon scenario and its likely impact on Indian agriculture sector on 10th August, 2023.

Dr. M. Mohapatra, DG, IMD participated in an interview on the Indian Monsoon by Ms. Deexa Khanduri of Sputnik News on 24th August, 2023.

Dr. M. Mohapatra, DG, IMD had an interview by BQ Prime on Monsoon on 30th August, 2023.

Dr. M. Mohapatra, DG, IMD participated in an interview on Indian Monsoon by Shri Mayank Bhardwaj, India Team Leader - Commodities - Thomson Reuters on 31st August, 2023.

IMD organized the regular monthly on-line Press Conference on Monthly outlook for rainfall and temperature during September, 2023 on 31st August. **Dr. M. Mohapatra**, DG IMD made the presentation and participated in the online QA Session. Media team countrywide participated in the press conference. The detailed Press Release issued in this regard is available at the link: https://internal.imd.gov.in/press_release/20230831_pr_2505.pdf.

The Press Meet is available at link: https://www.youtube.com/live/m_K4Wa3vYHg?si=GCy_X3XiAv_GM5oU

A local Batesi TV channel visited MC Shillong on 4th July, 2023. They release a 13 minute special video of IMD activities in Meghalaya on their YouTube channel with more than 52k views as of 30 September, 2023. <https://youtu.be/8VsgV4NmBCQ?si=4rviS5Wr055NECpA>.

Dr. Sreekanth T.S., Sc.- D, Radar, RMC Nagpur gave interview and introduction to working of Doppler Weather Radar to UCN news dt 27th September, 2023.

https://youtu.be/8O6UI8W_X4c?si=MALEmHa4iEE6db0v
<https://youtu.be/XF3L6t8pG1c?si=zm7uKn3aVJtVGYGE>

Infrastructure Development & Installations

NEW PROJECTS/SCHEMES INITIATED

Chandrapur Met observatory has been converted into departmental observatory.

IMD e-AWAS package on 1st July, 2023 which is a web-based application, which helps in the Online Accommodation Application of IMD Quarters. The Employee can request for accommodation online and the In-charge of Quarters can process his request and take further action for allotment. As a pilot project it is started with Delhi Office and in future may be implemented in all IMD offices.

IMD Audit Para Status System (IMD APSS) version 1.0 on 17th August, 2023, which is an online system on METNET for Monitoring the status and obtaining the reply from concerned

office/section for the Audit Para received from the Internal and External Audit party. Version 1.0 is launched for DGM Office as a Pilot Project.

New AWS was propose for World's Rainiest place at Mawsynram. The project was approved by Head, RMC Guwahati with site selection completed on 4th August, 2023 and NOC received from DDMA East Khasi Hills.



New AWS was propose for World's Rainiest place at Mawsynram

A novel rain gauge prototype is tested on a rain gauge calibration test bench at the Surface Instrumentation Laboratory IMD Pune, for syphon volume and total accumulated rainfall intensity up to 88 mm/hr.

DCWIS and PWD systems were installed at the following airports.

July : Gondia (RWY 04); Pantnagar (RWY10); Thiruvananthapuram (RWY 32)

August : Mumbai (RWY 32); Juhu (RWY 08) ; Surat (RWY 22) ; Moradabad (RWY 12) ; Calicut (RWY 10 & 28) ; Salem (RWY 04); Coimbatore (RWY 23); Madurai (RWY 27); Trichy (RWY 09/27)

September : Coochbehar (RWY 22); Vadodara (RWY 22); Jharsuguda (RWY 24)



PWD at Vadodara

Utkela Airport, Scheduled flight service from BPI Airport under RCS UDAN scheme started on 31st August, 2023. Two officials - **Shri P. K. Mallick**, Met-A & **Shri P. Chaudhary**, S.A. of MC Bhubaneswar are on tour to Utkela to provide aviation meteorological services. Instruments like AT/RH & hand-held anemometer, wind vane has been sent to RCS Airport Utkela for aviation met services by IMD officials.

Weather Information

Significant Weather Features and Rainfall over India.

Southwest Monsoon covered the entire country on 2nd July, 2023. The Southwest Monsoon has further advanced into remaining parts of Rajasthan, Haryana and Punjab on 2nd July, 2023 and thus has covered the entire country on 2nd July, 2023, against the normal date of 8th July (6 days ahead of the normal date for entire country coverage). The isochrones in respect of the advance of Southwest Monsoon 2023 is given in the Fig. 1 below:

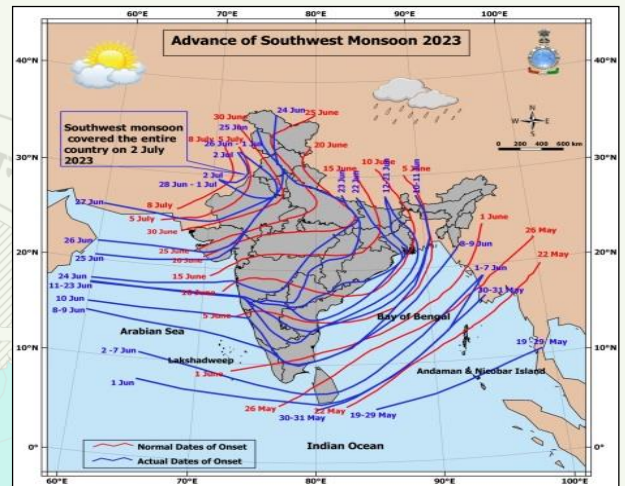
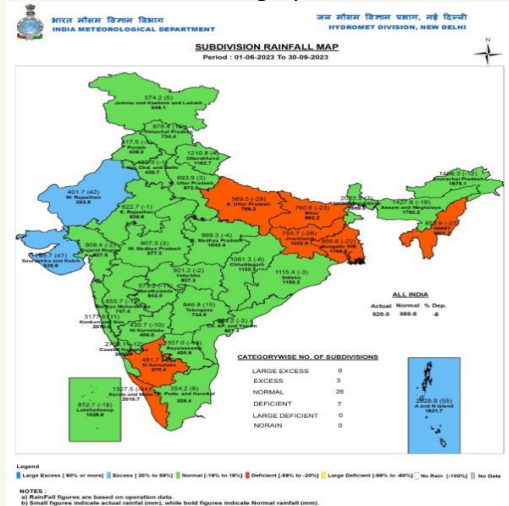


Fig. 1

The rainfall statistics for the Monsoon season 2023

The rainfall for the country as a whole, for the Monsoon season - 2023 has been recorded as 820.0 mm which is 94% of its Long Period Average (LPA) of 868.6 mm. In all, category wise, 03 Met sub-divisions in EXCESS, 26 Met sub-divisions in NORMAL, 07 in DEFICIENT and no any Met. Sub-divisions in LARGE EXCESS, LARGE DEFICIENT, NO RAIN category of rainfall.



End of SW Monsoon : The forecast for monsoon onset over Kerala for this year was correct. The Forecast date of onset of monsoon over Kerala was 4th June with a model error of ± 4 days and realized date of onset of monsoon over Kerala was 8th June.

The first stage forecast for the season (June-September) rainfall over the country as a whole issued in April was 96% of LPA with a model error of $\pm 5\%$ of LPA. The update issued on 26th May for this forecast was (96% of LPA) with a model error of $\pm 4\%$ of LPA. The actual season rainfall for the country as a whole was 94% of LPA. Thus, the both the forecasts were within forecast limits and therefore the forecast was correct.

Considering the four broad geographical regions of India, the forecasts issued in 26th May, the southwest monsoon seasonal rainfall was most likely to be below normal over Northwest India (<92% of LPA) and normal over other three broad homogeneous regions; central India (94-106% of LPA), North East India (94-106% of LPA) and South Peninsular India (94-106% of LPA). The southwest monsoon seasonal rainfall over the monsoon core zone consisting of most of the rainfed agriculture areas in the country was most likely to be Normal (94-106% of LPA). The actual rainfall departure over Northwest India, Central India, Northeast India, South Peninsula and Monsoon Core Zone were 1%, 0%, -18%, -9% and 1% of the LPA respectively. Thus, rainfall over northwest and northeast India were underestimated and overestimated respectively.

The forecasts for the monthly rainfall over the country as a whole for the months of June and August were below Normal (<92% of LPA) and (<94% of LPA) respectively and observed rainfall was 91% & 64% respectively. For the month of July, it was predicted that rainfall for the country as a whole would be on positive side of normal (94-106% of LPA) and September Normal (91-109% of LPA). Based on extended range forecast issued on 30 September, it was stated that there would be good rainfall in September. The observed rainfall in July and September was 113% of LPA each. The realised spatial rainfall pattern matched well for all the individual months except September. The second half of the monsoon season (August – September) rainfall was below normal against the prediction of rainfall in the negative side of the normal rainfall. Thus, the trend of rainfall in second half of monsoon season was well predicted. It was also predicted since April that the El Nino would have no impact in first half and could adversely impact in second half of the monsoon season, which is found to be correct.

Summary of state of climate during the period July to September 2023 is as follows:

In July, over the country the mean temperature was 28.40°C with an anomaly of 0.43°C and the 7th highest since 1901. Among the four homogeneous regions, over East & Northeast India the mean temperature was the second highest (29.38°C with an anomaly of 1.45°C) after the year 2022(29.45°C) since 1901. Over East & Northeast India the maximum temperature

was the 2nd highest (33.23°C with an anomaly of 1.78°C) after the year 2022 (33.59°C) and the minimum temperature was the highest (25.53°C with an anomaly of 1.13°C) since 1901.

In August, over the country the mean temperature was 28.45°C with an anomaly of 0.90°C and the highest since 1901. Over the country as a whole the maximum temperature was the highest (32.19°C with an anomaly of 1.10°C) and the minimum temperature was the 2nd highest (24.70°C with an anomaly of 0.69°C) after the year 2020 (24.73°C) since 1901. Among the four homogeneous regions, over South Peninsular India the mean temperature was the highest (28.96°C with an anomaly of 1.30°C) since 1901. Over South Peninsular India the maximum temperature was the highest (32.66°C with an anomaly of 1.73°C) and the minimum temperature was also the highest (25.26°C with an anomaly of 0.86°C) since 1901. Over Northwest India the mean temperature was the 4th highest (28.04°C with an anomaly of 0.70°C) since 1901. Over Northwest India the maximum temperature was the 9th highest (32.48°C with an anomaly of 0.70°C) and minimum temperature was the 4th highest (23.61°C with an anomaly of 0.70°C) since 1901. Over Central India the mean temperature was also the 4th highest (27.82°C with an anomaly of 0.62°C) since 1901. Over Central India the maximum temperature was the 6th highest (31.05°C with an anomaly of 0.84°C) and minimum temperature was the 3rd highest (24.58°C with an anomaly of 0.40°C) since 1901. Over East & Northeast India the mean temperature was the 5th highest (28.74°C with an anomaly of 0.62°C) since 1901. Over East & Northeast India the maximum temperature was the 9th highest (32.33°C with an anomaly of 0.57°C) and minimum temperature was the 6th highest (25.15°C with an anomaly of 0.67°C) since 1901.

During the month of September, over the country the mean temperature was 28.23°C with an anomaly of 0.91°C and the highest since 1901. Over the country as a whole the maximum temperature was the 3rd highest (32.19°C with an anomaly of 0.82°C) and the minimum temperature was the highest (24.26°C with an anomaly of 1.01°C) since 1901. Among the four homogeneous regions, over East & Northeast India the mean temperature was the highest (29.21°C with an anomaly of 1.74°C) since 1901. Over East & Northeast India the maximum temperature was the highest (33.33°C with an anomaly of 2.17°C) and minimum temperature was also the highest (25.09°C with an anomaly of 1.32°C) since 1901. Over Northwest India the mean temperature was the highest (27.91°C with an anomaly of 1.53°C) since 1901. Over Northwest India the maximum temperature was the 3rd highest (32.97°C with an anomaly of 1.21°C) and minimum temperature was the highest (22.85°C with an anomaly of 1.86°C) since 1901. Over Central India the mean temperature was the 7th highest (28.06°C with an anomaly of 0.50°C) and the minimum temperature was the 2nd highest (24.46°C with an anomaly of 0.75°C) since 1901. Over South Peninsular India the mean temperature was the 8th highest (28.08°C with an anomaly of 0.39°C) and the minimum temperature was the 6th highest (24.65°C with an anomaly of 0.47°C) since 1901.

