

Science and Engineering Research Board
(a statutory body of the Department of Science & Technology, Government of India)
Brief report of the organized event
(Financial Assistance to Seminar / Symposia)

Date: 07/11/2023

SERB Sanction / File No: SSY/2023/000624

1. Name of Academic Institution / University / Society etc. under whose auspices the Seminar / Conference /

Workshop / Symposium etc. was organized: ICAR-CRIDA Hyderabad.

2. Title of the Seminar / Conference / Workshop / Symposium etc.:

“Reorientation of Education and Research in Agricultural Meteorology for Efficient Agromet Advisory Services and Climate Resilient Agriculture”

3. Duration / Period of the organized event: 28 September 2023 to 29 September 2023

4. Grant Sanctioned: Rs.2,00,000/- (Two Lakh only)

5. Summary of the event (Max. 1000 Words):

Proceeding of the brainstorming workshop on “Reorientation of Education and Research in Agricultural Meteorology for Efficient Agromet Advisory Services and Climate Resilient Agriculture” Jointly organized by Association of Agriculture Meteorologists (AAM) and ICAR-CRIDA Hyderabad.

Venue: CRIDA, Santhoshnagar, Hyderabad

Duration: 28.09.2023- 29.09.2023

Rationale and Objectives: Agricultural production including its allied enterprises globally, more so Asian Countries, are under increasing threat due to climate change. Various climate change-driven extremes, i.e., drought, heat waves, erratic monsoons, intense rainfall patterns, storms, floods, and emerging insect pests’ life cycle dynamics are already affecting the livelihood of millions of farmers in India. As per latest IPCC 6th report, climatic predictions show a significant increase in temperature, and erratic rainfall with higher intensity while variability exists in climatic patterns for climate extremes prediction. Historical weather records maintained by IMD for the last 150 years also stand testimony to find increasing temperatures, greater variability in the inter-seasonal and intra-seasonal variability in rainfall, increased frequency of extreme weather conditions like floods, droughts, heat waves, cold waves, hail storms etc resulting in considerable loss in agricultural production. While climate determines the possible agricultural production

systems, weather plays important role in planning and management of agricultural production systems in any given zone/region.

The IMD is now well equipped with providing forecasts of long-range SW Monsoon rainfall, sub-seasonal, medium-range and short-range weather forecasts with much greater reliability. The long-range forecasts help evolve contingency crop plans, sub-seasonal weather forecasts aid in increased preparedness, medium-range weather forecasts facilitate input management and mobilization of resources for field operations and short-range forecasts are best used for field operations to be carried out based on Agromet-advisories services (AAS) provided by the agricultural scientists and extension workers of ICAR / SAUs, which has already been taken up across India through Grameen Krishi Mausam Seva (GKMS).

However, the effectiveness of AAS can be greatly improved by generating research-based information on weather effects on growth and development of crops during different phenophases of its life cycle. Rise in seasonal average, summer maximum and winter minimum temperatures will have direct influence on crop duration, development cycle, water demand, extent of stress faced by the crops etc, thus affecting the performance of crops. This requires revision / updating of our knowledge base in higher education and research to optimise climate-smart and climate-resilient agricultural practices and technology for sustainable productivity. This is possible through (i) required modification in education at various level in agriculture meteorology subject with an aim to produce skilled agrometeorologist who can deal with modern observational system vis-à-vis changing climate and its projected impacts on agriculture, (ii) reorienting research studies, methodologies, experiments to develop new crop-weather relations, thresholds in changing / extreme climate scenarios and (iii) develop interface / decision support system (DSS) tools and techniques to transform the R&D products into decision making by planners and application by farmers.

At present, under the SAU system across India the discipline of Agricultural Meteorology is taught in one course at Under Graduate level. With just one course, interested students join for Masters in this discipline, which is not sufficient. There is an urgent need to restructure the syllabus for the Under Graduate courses to adequately include the subject and prepare the UG students to realize the importance of different aspects / products available from meteorological / agro-meteorological services in agricultural planning and management as most of the agricultural extension workers join for the service soon after undergraduate level.

At present Post Graduate (Master) degree program in Agricultural Meteorology is offered in about 19 SAUs and Ph.D. program is offered in about 10 SAUs. Here too, there is need to develop course content and practical training schedules / modules to adequately and comprehensively find solutions in the identified thrust areas of research relevant to Climate Resilient Agriculture so that more appropriate skill sets are gained by Master / PhD research students to further their profession in R&D / Education as well as prepare location,

crop and time specific accurate Agromet Advisories to guide the farmers in their routine decision making to reduce the climate risks vis-à-vis crop yields or adequately insure / compensate the loss through timely interventions.

Therefore, in view of the above, two-days Brain Storming Workshop involving the best available experienced and eminent scientists from across India in the field of Meteorology and Agricultural Meteorology was held on 28 and 29, September 2023 at ICAR-CRIDA, Hyderabad with following objectives:

- i) To identify the thrust areas of research in Agricultural Meteorology to meet the requirements of Agromet Advisory Services and Climate Smart Agriculture,
- ii) To identify organizations / institutions which can plan, guide and monitor research work in different thrust areas of research,
- iii) To develop course content and practical schedules to improve their Capabilities for undertaking research and formulation of efficient Agromet advisories,
- iv) To identify infrastructure and faculty needs required for better education, and
- v) To develop training modules for the faculty in SAUs for reorientation of education system and project-based learning of the students.

The workshop was attended by around 50 participants from various ICAR institutes, State Agricultural Universities (SAUs), IMD and other institutes across the country. The two-days event was divided into number of sessions: i) Thrust areas of research, ii) Post-Graduate teaching, iii) Under-Graduate teaching, and these were followed by Sub-Groups meeting and Presentations of the discussion / decision taken in each session. Under each session experts presented their ideas, participants deliberated on each sub-topic and discussed before coming up with resolutions / recommendations which were presented during the last session. Details of technical sessions are as under

The **inaugural session** was graced by Dr L.S. Rathore, Former Director General, IMD, Prof B.V. Ramana Rao, Former PC (AICRPAM), Dr K.K. Singh, President, AAM and Dr S.K. Bal, PC AICRPAM. Dr V.K. Sehgal, Principal Scientist, IARI, New Delhi, Dr Manoj K. Nanda, Head, Dept. of Agromet and Physics, BCKV, Mohanpur and Dr P.K. Kingra, Head, Dept. of Agrometeorology and Climate Change, PAU, Ludhiana were the ignite speakers for different technical sessions. Dr V. Geethalakshmi, Vice Chancellor, TNAU, Coimbatore graced the Plenary session as chief guest and Dr V.K. Singh, Director, ICAR-CRIDA as Guest of Honour. Dr Y.S. Ramakrishna, Former Director, ICAR-CRIDA and Dr D. Raji Reddy, Former Director of Extension, PJTSAU, Hyderabad presented a brief summary of the deliberations during the two days.

After the inaugural session, the brainstorming workshop commenced with three technical sessions.

Technical Session I

Technical Group-1: Prioritizing Research Areas in Agricultural Meteorology

Chairpersons: Dr V.K. Dadhwal

Dr Y.S. Ramakrishna

Dr B.V. Ramana Rao

Rapporteurs: Dr Sunayan Saha

Dr Sarath Chandran M.A.

Dr Timmanna

Ignite presentation: Dr V.K. Sehgal, Principal Scientist Division of Agril. Physics, IARI, New Delhi

Dr. Sehgal enlightened his visions on the topic Agrometeorology Research in India: Status and future directions. The process of finding facts or solutions to any problem should be systematically, experimentally, and logically done. The characteristics of scientific research include purposiveness, rigor, replicability, objectivity, and generalizability. He mentioned the scope of agromet research in crop husbandry, animal husbandry, fisheries, and agroforestry under various scales, such as processes at the leaf to landscape level, hourly to seasonal time frames, and future scenarios, with a focus on conditions near the surface (SBL). He also put forward the scope of intra and interdisciplinary research in various fields. Dr. Sehgal also provided the present status of the national agricultural sector and emphasized the importance of the monsoon in Indian agriculture. He mentioned that the overall goal of Agromet research should be to increase production, secure income, and promote sustainable development. He also mentioned eight focuses for agri-governance in the 21st century and discussed various agricultural programs and schemes in India. In the rest of the presentation, he highlighted future research areas, which include agromet advisories, crop and livestock insurance, the impact and management of extreme weather events, abiotic and biotic stress management, environmental pollution and degradation, carbon farming and green credits, and resource use efficiency. Under agromet advisories, he mainly focused on medium-range weather forecast-based agro advisory systems, field-scale customized agro advisories, and real-time feedback.

Technical Session II

Technical Group-2: Reorienting Postgraduate Teaching in Agricultural Meteorology

Chairpersons: Dr V.U.M. Rao

Dr G.H.S.L.V. Prasada Rao

Dr S.C. Bhan

Rapporteurs: Dr Sumanta Chatterjee

Dr Ankita Jha

Dr Shravani Sanyal

Ignite presentation: Dr Manoj K. Nanda, Head (Dept. of Agri-Met & Physics), BCKV, Mohanpur

Dr. Manoj K. Nanda presented the current status and future needs of postgraduate Agrometeorology education in India. He emphasized several key points, including faculty strength and infrastructural requirements, the scope for revising the curriculum framework

and syllabi, capacity building of faculties to enhance efficiency, and the establishment of inter-institutional and industry linkages to expose students and faculties to real-world applications. According to him, many universities are facing shortages of faculty members and support staff. He mentioned that a significant constraint in most universities is the lack of a sustainable source of funding. He suggested solving this issue by exploring research projects for the development of instruments and laboratory setups and seeking corporate funding from instrument companies, insurance companies, IT industries, and others. Dr. Nanda also emphasized the importance of study tours or exposure visits for students to other institutes and proposed student exchange programs for a portion of their dissertation work. He recommended aligning the curriculum framework with the National Education Policy (NEP) and bridging the gap between the syllabi for Master's and Doctoral programs and the ASRB-NET syllabus by introducing new courses for these programs. Furthermore, he discussed the development of training modules, lecture notes, and practical manuals, as well as the facilitation of linkages through the Agrometeorology and Agricultural Meteorology (AAM) platform. He also suggested conducting a review and reform of postgraduate teaching during a special session at a National Seminar and publishing students' research in a special issue of the Journal of Agrometeorology (JAM) to provide students with industry exposure and enhance their employability.

Technical Session III

Technical Group-3: Re-positioning the Role of Agrometeorology in Undergraduate Teaching

Chairpersons: Dr D. Raji Reddy

Dr G.K. Das

Dr N.K. Sathyamoorthy

Rapporteurs: Dr K.K. Dakhore

Dr B. Ajithkumar

Dr Hari Mohan Meena

Ignite presentation: Dr (Mrs) P.K. Kingra, Head (Dept. of Agri-met and Climate Change), PAU, Ludhiana

Dr. P. K. Kingra delivered a presentation on undergraduate (UG) teaching in Agrometeorology, offering a retrospective analysis and outlining the way forward. He provided an overview of the current status of UG Agrometeorology courses in various State Agricultural Universities (SAUs) and made comparisons. Dr. Kingra suggested the addition of related courses, such as Environmental Studies and Disaster Management (offered by HAU), Geoinformatics and Nanotechnology for Precision Farming (offered by HAU, OUA&T, GBPUA&T, Punjab Remote Sensing Centre, and Agromet), and Agricultural Informatics (related to Computer Science/IT and offered by HAU, OUA&T, GBPUA&T).

She observed that many SAUs commonly include Introductory Agrometeorology and Climate Change (1+1) as core courses and optional courses like System Simulation and Agro-advisory (2+1) in their UG programs. She also highlighted the emerging climatic challenges, such as increased weather and climate variability, higher frequency and intensity

of extreme weather events (e.g., droughts, floods, heat stress, lightning), increased uncertainty in crop yields, and a lack of awareness about climatic issues. Dr. Kingra emphasized that these challenges have multifaceted impacts across various fields, underscoring the importance of addressing them at the UG level. As a result, she proposed the introduction of a new course titled "Climate Change and Extreme Events – Impacts and Management in Agriculture" (2+1).

The brainstorming workshop ended with formal vote of thanks proposed by Dr Santanu Kumar Bal, Project Coordinator, AICRPAM and Dr K. K. Dakhore, Joint Secretary, AAM.

Here are the resolutions / recommendations made under each theme / session:

I) Thrust Areas of Research:

Important researchable thrust areas are identified under various research themes and are listed in a tabular format attached as Annexure-I.

- ✓ Research may be aligned with priority program of State / Centre program and schemes with clear hypothesis statement
- ✓ Agrometeorological community should be included in the Network projects for phenology data collection
- ✓ Agrometeorologists should be made part of cropping system research programs for identifying efficient and profitable cropping zones
- ✓ Strengthening the disease & pest surveillance and analysis of data by including Agrometeorologists in research team
- ✓ Identifying climatic hotspots as well as management solutions through multidisciplinary approach
- ✓ Developing a protocol for assessing quality of meteorological data from private firms need to be developed

II) Post Graduate Teaching:

- ✓ First and the foremost recommendation proposed was to bring homogeneity in ICAR-ARS-NET and Post Graduate BSMA syllabus so that what students are taught as per BSMA syllabus is included in ICAR-ARS-NET examination syllabus. Lots of discrepancy was observed in this aspect, hence, proposed to revise ICAR-SRF-NET syllabus with more emphasis on Agrometeorology
- ✓ While offering PG courses emphasis must be given more on study tours, student exchange programs, and inter-institutional linkages for research work / exposure trips.

Accordingly budgetary provision must be made for the department and for the course as well.

- ✓ Uploading of online lecture series and training materials pertaining to different modules (or their links) on AAM association website after quality check and should be shared across institutes
- ✓ Designing of lecture wise practical courses and sharing across institutions
- ✓ Capacity Building for young and mid-career level professionals: Association may facilitate on AAM website to List Experts covering different skill-based or techniques / data analysis tool-based training modules so that interested institutions can avail the expert services both on-line and physical mode of summer schools
- ✓ Inclusion of livestock and fisheries sector meteorology in the course curriculum
- ✓ Request to increase the number of ICAR-SRF seats for PhD admission
- ✓ Encourage student participation in conferences and seminars
- ✓ Inclusion of Agromet as a core subject as part of IARI outreach program

iii) Under Graduate Teaching:

- ✓ After much deliberation and discussion, it was strongly recommended to recruit qualified / specialized teachers in the field of Agricultural Meteorology to offer UG courses in all colleges where Agricultural Meteorology courses are offered.
- ✓ It was also decided to have two UG courses instead of one; first course Introductory Agrometeorology (AGM-101) with 1+1 credit hours in 1st Semester of UG degree program and second course proposed in the workshop is Climate Change and Extreme Events (1+1 credit hours) in place of System Simulation and Agro-advisory in 6th Semester of UG degree program. The detail module / chapter wise course content for both the courses is attached as **Annexure-II**.
- ✓ The expert members also recommended to start a **RAWE Program Experiential Learning Program (ELP) Module** (0+10 credit hours) on ‘Weather based agro-advisory Services to Farmers’ in the context of changing climate and projected impacts on agriculture and allied areas. This will expose UG students to various sources (Public and Private) of weather forecasts, learn hands-on to extract / download / collect data or information on one hand, and crop / animal based agro-advisories from expert scientists on the other to develop / prepare crop/location/time specific weather forecast based agro-advisories. This will skill all those UG graduates who would not continue Master’s degree program, but join for service in the Department of Agriculture / Horticulture / Sericulture / Forestry / Revenue of State Government, work for NGOs, FPOs, SHGs or event start their own farming enterprise or agro-input retail service.

Annexure-I

Prioritizing Research Areas in Agrometeorology in the context of Agromet Advisory Services and Climate Resilient Agriculture

Broad Theme	Researchable Issues
Agro-climatic Analysis	<ol style="list-style-type: none">1. Revisiting in agro-climatic zones at state level by undertaking Agro-climatic analysis for the recent decades2. Dynamic / Live agroclimatic Atlas at the national level3. Dynamic climate risk matrix analysis and atlas for each crop and growth stage of the crop4. Improvised crop suitability map should be prepared by including weather data5. Generation of homogenized database of agromet parameters from diff sources (IMD, UAV, Satellite etc.)
Crop Weather Relationship	<ol style="list-style-type: none">1. Revision of district wise crop weather pest calendars by including current and to-be released varieties / hybrids2. Agrometeorology of protected cultivation (floriculture/poly houses) must be studied and standardized3. Reanalysis of agriculture and weather data to identify phenology wise weather threshold limits / triggers4. Characterizing cardinal points for new crop varieties / hybrids5. Studies on orchard / fruit tree phenology at multiple locations using phenocam or simple cameras and image analysis tools6. 3-D crop canopy modelling for PAR and radiation use efficiency studies
Crop/Livestock Insurance	<ol style="list-style-type: none">1. Developing agromet products (Agromet indices and Triggers) ACZ wise for effective implementation of weather-based insurance schemes2. Develop yield index-based insurance schemes / methods
Crop Modelling and ICT Applications for Digital Agrometeorology	<ol style="list-style-type: none">1. Remote sensing for crop yield loss assessment at block level2. Ensemble crop simulation modeling approach to generate more reliable and robust climate smart adaptive management practices3. Developing simple, low-cost equipment to measure leaf wetness for forecasting pest/disease4. Developing Nano-bio sensors for non-destructible determination of plant parameters like plant water content
Agromet Advisory Services (AAS)	<ol style="list-style-type: none">1. Developing customized farm level agromet products by downscaling high-resolution weather forecasts using statistical methods or by using numerical models (WRF)2. Developing localized i.e., at field/farm scale and crop-stage-specific actionable agromet forecast with provision for clientele feedback3. Designing of AAS for different groups of farmers keeping in view differences in technological access and soil fertility in addition to crop-weather relationship

	<ol style="list-style-type: none"> 4. Impact assessment of Extreme weather events and devising appropriate management practices 5. Making use of soil thermal environment data of IMD in preparation of agromet advisories
Abiotic and biotic stress management	<ol style="list-style-type: none"> 1. Early detection techniques for incidence of pests 2. Sensor, IoT, Photos, data analytics, Mobile Apps and RS based system for water and nutrient stress management
Carbon farming/Green credit	<ol style="list-style-type: none"> 1. Agroclimatic characterization of regenerative agricultural practices 2. Modelling C stock and emission of GHGs under regenerative agricultural practices
Environmental pollution and degradation	<ul style="list-style-type: none"> • Sources of pollution from agriculture, their impact on agriculture; impacts and adaptation

Annexure-II

Under Graduate Courses:

The existing course titled “Introductory Agrometeorology and Climate Change (1+1)” offered during first year is proposed to rename as “Introductory Agrometeorology (1+1)” with following syllabus for theory lessons and practical sessions.

Theory lesson units:

- ✓ Agrometeorology – definition and scope.
- ✓ Earth atmosphere – its composition, extent, structure and importance.
- ✓ Atmospheric weather variables. Elements and factors of weather and climate - Atmospheric pressure, Wind, Atmospheric humidity, Solar radiation, Atmospheric temperature
- ✓ Energy balance of earth.
- ✓ Precipitation – Process, Types, Cloud formation and classification, Artificial rainmaking.
- ✓ Monsoon – mechanism and importance on Indian agriculture.
- ✓ Weather hazards – types, causal factors, impacts, management
- ✓ Agriculture and weather relations – role of each variable, interactions,
- ✓ Modifications of microclimate – its role and methods
- ✓ Climatic normals for crop and livestock production.
- ✓ Weather forecasting – types, relevance and applications in agriculture.

Practical sessions:

- ✓ Visit to agrometeorological observatory – Site selection, types, exposure to instruments and weather data recording, instrument maintenance.
- ✓ Measurement of total, short and long wave radiations and their estimation using Planck's intensity law.
- ✓ Measurement of albedo and sunshine duration, computation of radiation intensity using BSS method.
- ✓ Measurement of maximum and minimum air temperatures, tabulation, trend and variation analysis and graphical presentation and interpretation.
- ✓ Measurement of soil temperature and computation of soil heat flux.
- ✓ Determination of vapor pressure, relative humidity and dew point temperature.
- ✓ Measurement of atmospheric pressure and analysis of atmospheric conditions.
- ✓ Measurement of wind speed and wind direction, preparation of wind rose.
- ✓ Measurement, tabulation and analysis of rainfall.
- ✓ Computation of drought indices.
- ✓ Measurement of open pan evaporation and evapotranspiration.
- ✓ Computation of PET and AET.

Proposed second and new Core Course is Climate Change and Extreme Weather Events (1+1) proposed during 6th semester of UG program.

Theory lesson units:

- ✓ Climate Change – causes and effects; Green House Effect & Global warming; anthropogenic & natural causes, Future Projections – IPCC reports.
- ✓ Extreme weather events – Heat wave, hailstorm, lightning, drought, flood, cyclone & their effect on crop growth & yield.
- ✓ Statistical techniques to analyse extreme weather events.
- ✓ Impact of climate change on biotic stress; incidence & dynamics of pests & diseases, concept of weather based forewarning models.
- ✓ Introduction to crop modelling- types; empirical, statistical, dynamic, common minimum dataset & its application in operational crop management using any one of the crop simulation models (DSSAT / APSIM / INFOCROP / CROPSYST).
- ✓ Geospatial techniques to monitor crop stress – application of remote sensing, satellite & drone-based technology, yield loss assessment.
- ✓ Weather forecast & Agro-advisory services, special weather bulletins for extreme events

Practical sessions:

- ✓ Statistical techniques / methods to analyze weather data
- ✓ Assessing and quantifying the impacts of Climate Change and extreme events on crop growth, yield using various techniques
- ✓ Crop simulation modeling– model environment & data structure and application
- ✓ Remote sensing techniques – Detection of biotic and abiotic stresses in crops
- ✓ Sourcing of weather forecast and various products

- ✓ Preparation of weather forecast at different scales, special weather bulletins and
 - ✓ Preparation of crop and time specific agro-advisories and their importance to reduce climate risks
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List of Participants who attended the brainstorm workshop

Sl No.	Name in Full	Designation	Organization (Current Affiliation)	City	State
1	Prof. Geethalakshmi	Vice Chancellor	TNAU	Coimbatore	Tamil Nadu
2	Dr A.M. Shekh	Ex Vice Chancellor	AAU	Anand	Gujarat
3	Dr K.K. Singh	President, AAM	AAM	New Delhi	Delhi
4	Dr M.K. Nanda	Head, Dept. of Agromet & Physics	BCKV	Mohanpur	West Bengal
5	Prof Pavneet Kingra	Head, Dept. of Agromet	PAU	Ludhiana	Punjab
6	Prof Vinay Sehgal	Principal Scientist	IARI	New Delhi	Delhi
7	Dr B.V Ramana Rao	Former PC, AICRPAM	CRIDA	Hyderabad	Telangana
8	Dr Sathyamoorthy N.K.	Head, Dept. of Agromet	TNAU	Coimbatore	Tamil Nadu
9	Dr Ravi Patil	Head, Dept. of Agromet	UAS	Dharwad	Karnataka
10	Dr Rajendra Lakpale	Head, Dept. of Agromet	IGKV	Raipur	Chattisgarh
11	Prof T. Prathima	Professor (Agromet)	ANGRAU	Tirupati	Andhra Pradesh
12	Dr M.G. Jadhav	Head (Dept. of Agromet)	VNMKV	Parbhani	Maharashtra
13	Dr. B. Ajith Kumar	Head, Dept. of Agromet	KAU	Thrissur	Kerala
14	Dr. K.K. Dakhore	Agrometeorologist	VNMKV	Parbhani	Maharashtra
15	Dr. S.C. Bhan	Scientist-G	IMD	New Delhi	Delhi
16	Dr. S.R. Ghadekar	Professor (Retd.)		Nagpur	Maharashtra
17	Dr. H.S.Shivaramu	Dean, College of Horticulture	UHS	Kolar	Karnataka
18	Dr. Kripan Ghosh	Scientist-F	IMD	Pune	Maharashtra
19	Dr. N.V.K. Chakravarty	Former Head, Division of Agril. Physics	IARI	Hyderabad	Telangana
20	Dr. Pazhanivelan	Director, CWGS	TNAU	Coimbatore	Tamil Nadu

21	Dr. G.S.L.H.V. Prasada Rao	Former Associate Dean, CoH	KAU	Tenali	Andhra Pradesh
22	Dr. Abdus Sattar	Associate Professor (Agromet)	RPCAU	Samastipur	Bihar
23	Dr. Sunayan Saha	Senior Scientist (Agromet)	CPRI RS	Bathinda	Punjab
24	Dr.H.M. Meena	Senior Scientist (Agromet)	CAZRI	Jodhpur	Rajasthan
25	Dr. Sumanta Chatterjee	Scientist (Agromet)	NRRI	Cuttack	Odisha
26	Dr. J L Chaudhary	Senior Scientist (Agromet)	IGKV	Raipur	Chattisgarh
27	Dr. Ankita Jha	Scientist (Agromet)	IWM	Bhubaneswar	Odisha
28	Dr. V.K. Dadhwal	Former Director NRSC, IISST	ISRO		
29	Dr. Y. S Ramakrishna	Former Director	CRIDA	Hyderabad	Telangana
30	Dr. G.G.S.N. Rao	Former PC, AICRPAM	CRIDA	Hyderabad	Telangana
31	Dr V.U.M. Rao	Former PC, AICRPAM	CRIDA	Hyderabad	Telangana
32	Dr P. Vijay Kumar	Former PC, AICRPAM	CRIDA	Hyderabad	Telangana
33	Prof D. Raji Reddy	Former DR	PJTSAU	Hyderabad	Telangana
34	Dr G. Sreenivas	Professor	PJTSAU	Hyderabad	Telangana
35	Dr Mahadevappa	Associate Professor	ACRC, PJTSAU	Hyderabad	Telangana
36	Dr Vinod Kumar Singh	Director	ICAR-CRIDA	Hyderabad	Telangana
37	Dr. Santanu Kumar Bal	PC (AICRPAM)	CRIDA	Hyderabad	Telangana
38	Dr. A.V.M. Subba Rao	Principal Scientist (Agromet)	CRIDA	Hyderabad	Telangana
39	Dr. Sarath Chandran	Scientist (Agromet)	CRIDA	Hyderabad	Telangana
40	Dr.Timmanna	Scientist (Agril. Entomology)	CRIDA	Hyderabad	Telangana
41	Ms. Shravani Sanyal	Scientist (Environmental Science)	NIBSM	Raipur	Chattisgarh
42	Dr. M.C. Varshneya	Former Vice Chancellor	AAU	Anand	Gujarat (Online)