



- Research Achievements
- Lectures Delivered
- Consultancy/Advisory Services
- Personnel
- Panorama of Activities
- Participation
- Awards and Recognitions
- Publications
- Human Resource Development
- Copyrights Granted

From the Director's desk ...

This Newsletter brings to you the key research achievements, awards and recognitions received, training programmes conducted, workshops and conferences organized/attended, advisory services provided and significant publications of the Institute during the period under report.

A method of constructing asymmetric third order rotatable response surface designs by sequentially augmenting some additional points to the Asymmetrical Second Order Rotatable Designs (ASORDs) without discarding the runs in the first stage has been developed.

Comparative performance of some non-parametric methods for complex genetic architecture that are non-additive has been evaluated using simulated datasets generated at different levels of heritability and varying combinations of population sizes. Among them, Support Vector Machines (SVM) outperformed across a range of genetic architectures on genomic prediction accuracy.

Black Pepper Drought Transcriptome Database has been developed that catalogues all the genomic information like differential expressed genes, microsatellites, variants, transcriptional factors, pathways, domain and families of assembled transcriptome associated with root drought. ICAR-IASRI in collaboration with ICAR-IISR, Kozhikode identified rotundone backbone genes in black pepper.

Multivariate Small Area Estimation (SAE) technique has been used to obtain reliable and representative estimates of food consumption and nutrition status at district level for the rural areas of state of Uttar Pradesh in India. These estimates have been used to produce spatial maps showing district level inequality in distribution of food and nutrition security in the state of Uttar Pradesh.

The sampling methodology for estimation of post-harvest losses of livestock (Meat and Milk) developed by the Institute has been mentioned in FAO - Guidelines on the measurement of harvest and post-harvest losses - Estimating harvest and post-harvest losses in Zambia. Meat and milk (<http://www.fao.org/3/cb1965en/CB1965EN.pdf>).

During the reported period, 37 Research Papers, 9 Book Chapters, 2 SAS Macros, 9 R-Packages, 2 Project Reports and 1 Technical Bulletin were published.

The scientists of the Institute brought recognitions to the Institute by way of serving as Expert Members in various high level committees, delivering invited talks in prestigious forums. Several training programmes were conducted via online mode and many lectures have been delivered by the Scientists in various online training programmes.

I earnestly hope that the contents of this Newsletter would be useful and informative to you all. Any constructive comments for better presentation of this newsletter are most welcome.



(Rajender Parsad)

RESEARCH ACHIEVEMENTS

Developing/strengthening/ updating statistical methodologies/ techniques/ tools

Sequential asymmetric third order rotatable designs

Rotatable designs that are available for process/ product optimization trials are mostly symmetric in nature. In many practical situations, response surface designs (RSDs) with mixed factor (unequal) levels are more suitable as these designs explore more regions in the design space but it is hard to get rotatable designs with a given level of asymmetry. When experimenting with unequal factor levels via Asymmetric Second Order Rotatable Design (ASORD), the lack of fit of the model may become significant which ultimately leads to the estimation of parameters based on a higher (or third) order model. Experimenting with a new Third Order Rotatable Design (TORD) in such a situation would be expensive as the responses observed from the first stage runs would be kept underutilized. A method of constructing asymmetric TORD by sequentially augmenting some additional points to the ASORD without discarding the runs in the first stage has been developed. The designs obtainable from this method of construction are more economical to obtain the optimum response as the design in the first stage can be used to fit the second order model and with some additional runs, third order model can be fitted without discarding the initial design.

Genomic selection using non-parametric methods

Genomic Selection (GS) is the most prevalent method in today's scenario to assess the genetic merit of individual under study. It selects the candidates for next breeding cycle on the basis of their genetic merit. GS has successfully been used in various plant and animal studies in the last decade. Several parametric statistical models have been proposed and are being used successfully in various GS studies. However, performance of parametric methods becomes very poor when we have non-additive kind of genetic architecture. In such cases, generally, performance of non-parametric methods is quite satisfactory as these methods do not require strict statistical assumptions. Impact of genetic architecture on genomic prediction accuracy has been explored and comparative performance of few most commonly used non-parametric methods for complex genetic architecture that are non-additive has been evaluated using simulated datasets generated at different levels of heritability and varying combinations of population sizes. Among several non-parametric methods, Support Vector Machines (SVM) outperformed across a range of genetic architectures.

Disaggregate level disparities in food consumption and nutritional status via multivariate small area modelling

Although India has progressed significantly on several health outcomes but the state of food and nutrition security in the country still requires sustained efforts to accelerate achievement. Existing data based on socio-economic surveys conducted by National Sample Survey Office (NSSO) is used to produce precise measures of food and nutrition security status at state and national levels. However, these surveys cannot be used directly to produce reliable district or further smaller domain level estimates because of small sample sizes which lead to high level of sampling variability. Decentralized administrative planning system in India demands the availability of disaggregate (e.g. district) level statistics for target oriented effective policy planning and monitoring, as food and nutrition security is often unevenly distributed among the subsets of relatively small areas. But, due to lack of district level estimates, the mapping and analysis related to food and nutrition security measures are restricted to state and national level. As a result, disaggregate level dissimilarity and variability existing in food and nutrition security are often masked. Multivariate Small Area Estimation (SAE) technique has been used to obtain reliable and representative estimates of food consumption and nutrition status at district level for the rural areas of state of Uttar Pradesh in India by combining latest round of available Household Consumer Expenditure Survey 2011–2012 data of NSSO and the Indian Population Census 2011. The empirical evidence indicates that the estimates generated by SAE approach are reliable and representative. Spatial maps showing district level inequality in distribution of food and nutrition security in Uttar Pradesh are also produced. The disaggregate level estimates and spatial maps of food and nutrition security are directly relevant to Sustainable Development Goal (SDG) indicator 2.1.2: Severity of food insecurity. The estimates and maps of food insecurity indicators are anticipated to offer important information to administrative decision-makers and policy experts for identifying the regions requiring more attention.

BPDRTDb: Black Pepper Drought Transcriptome Database

Black Pepper Drought Transcriptome Database (<http://webtom.cabgrid.res.in/bpdrtdb/>) catalogues all the genomic information like differential expressed genes, microsatellites, variants, transcriptional factors, pathways, domain and families of assembled transcriptome associated with root drought. This web genomic resource has information of a total of 114598 transcripts, 4914 differential expressed genes, 20124 genic region putative SSR markers, 14742 primers and 259236 variants. This catalogues 246458 SNPs and 12778 Indels. It also houses 2110 transcriptional factors, 786 domains and 1137 families. These transcriptome characterizations of black pepper genotype and its web resource in the form of BPDRTDb will serve as valuable resources for new genes discovery as well as developing SSR markers in endeavour of higher crop production.



Identification of Rotundone backbone genes in Black Pepper

ICAR-IASRI in collaboration with ICAR-Indian Institute of Spices Research, Kozhikode identified rotundone backbone genes viz., α -guaiene synthase & α -guaiene oxidase in black pepper. The identification of the genes and compounds of the guaieue skeleton is expected to help in bioprospecting of black pepper varieties and also in recombinant production of the aroma compound.

Identification of novel Mitogen-activated Protein Kinase Genes in Wheat

ICAR-IASRI in collaboration with ICAR- Indian Agricultural Research Institute, New Delhi, ICAR-National Institute for Plant Biotechnology, New Delhi and Sher-e-Kashmir University of Agricultural Sciences and Technology, Srinagar identified twenty novel mitogen-activated protein kinase (MAPK) genes in wheat through gel-based proteomics and RNA-seq data analysis. Native wheat MAPK showed maximum activity in thermos-tolerant cv under heat stress. MAPK was observed to stabilize the starch quality of the grains under heat stress.

Online portal SReDAM on All India Co-ordinated Research Project on Cattle

The Institute has developed a web based online portal SReDAM in collaboration with ICAR-CIRC, Meerut. This software has been primarily developed for the real time data retrieval and management of all the information collected under the All India Co-ordinated Research Project on Cattle and can be used for buffaloes also. Databases have been developed and implemented in MySQL as back-end RDBMS. Web tools have been developed using PHP as server side scripting language for embedding HTML, database connectivity and database operations. R software has been used for analysis process at back-end. HTML and Java have been used for developing front-end tools.

R Packages developed: 09

- eemdTDNN: EEMD and Its Variant Based Time Delay Neural Network Model (available at <https://CRAN.R-project.org/package=eemdTDNN>), for forecasting univariate time series with different decomposition based time delay neural network models. (Kapil Choudhary, Girish Kumar Jha, Rajeev Ranjan Kumar and Ronit Jaiswal)
- EEMDelm: Ensemble Empirical Mode Decomposition and its Variant Based ELM Model (available at <https://CRAN.R-project.org/package=EEMDelm>) for forecasting univariate time series with different decomposition based Extreme Learning Machine models. (Girish Kumar Jha, Kapil Choudhary, Rajeev Ranjan Kumar and Ronit Jaiswal)
- EMDANNhybrid: Ensemble Machine Learning Hybrid Model (available at <https://CRAN.R-project.org/package=EMDANNhybrid>) to fit Empirical Mode Decomposition and Artificial Neural Network based hybrid model for nonlinear and non-stationary time series data. (Pankaj Das, Achal Lama and Girish Kumar Jha)
- ECTTDNN: Co-integration Based Time-delay Neural Network Model (available at <https://CRAN.R-project.org/package=ECTTDNN>) to make use of the information extracted by the co-integrating vector as an input in the neural network model. (Pankaj Das, Achal Lama and Girish Kumar Jha)

- MARSANNhybrid: Multivariate Adaptive Regression Spline (MARS) Based ANN Hybrid Model (available at <https://CRAN.R-project.org/package=MARSANNhybrid>) helps in selecting important variables using MARS and then fits ANN on the extracted important variables. (Pankaj Das, Achal Lama and Girish Kumar Jha)
- MARSSVRhybrid: MARS SVR Hybrid (available at <https://CRAN.R-project.org/package=MARSSVRhybrid>) helps in selecting important variables using MARS and then fits SVR on the extracted important variables (Pankaj Das, Achal Lama and Girish Jha)
- EMDSVRhybrid: Hybrid Machine Learning Model (available at <https://CRAN.R-project.org/package=EMDSVRhybrid>) to fit Empirical Mode Decomposition and Support Vector Regression based hybrid model for nonlinear and non-stationary time series data (Pankaj Das, Achal Lama and Girish Kumar Jha)
- stlELM: Hybrid Forecasting Model Based on STL Decomposition and ELM (available at <https://cran.r-project.org/web/packages/stlELM/index.html>) (Girish Kumar Jha, Ronit Jaiswal, Kapil Choudhary and Rajeev Ranjan Kumar)
- stlTDNN: STL Decomposition and TDNN Hybrid Time Series Forecasting (available at <https://cran.r-project.org/web/packages/stlELM/index.html>) (Girish Kumar Jha, Ronit Jaiswal, Kapil Choudhary and Rajeev Ranjan Kumar).

PANORAMA OF ACTIVITIES

National Conference on Techno-Scientific Challenges and Sustainable Solutions for Living Beings during Changing Environment

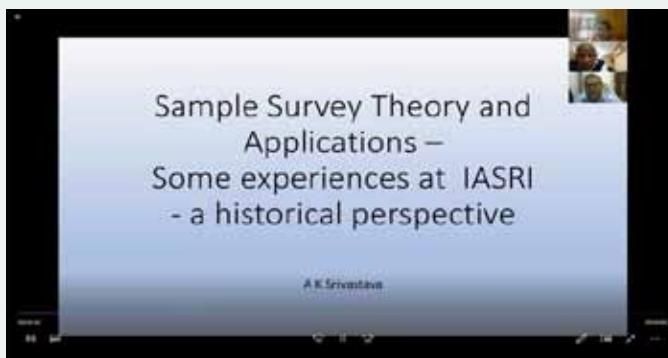
The Institute organized National Conference on Techno Scientific Challenges and Sustainable Solutions for Living Beings during Changing Environment (TCSE-2021) in hybrid mode in association with National Environmental Science Academy, New Delhi during January 29-30, 2021. The conference was formally inaugurated by Dr. R.C Agrawal, Deputy Director General (Agricultural Education), ICAR. Event also witnessed 33rd Annual Function of National Environmental Science Academy.

During the conference, seven technical sessions including 10 Keynote talks, 15 invited talks and various contributory talks were organized. A Technical Session on “Statistics and Informatics for Sustainable Solutions during Environment Change” was organized by the Institute. Dr. Rajender Parsad, Director, ICAR-IASRI, was in the advisory committee and Dr. Prabhat Kumar, NAHEP was the organizing secretary and Dr. Sudeep and Dr. Shashi Dahiya worked as Co-organizing Secretaries of the Conference.



National Science Day 2021

National Science Day was celebrated on February 28, 2021. Professor A.K. Srivastava, Former Joint Director, ICAR-IASRI delivered a lecture on Sample Survey: Theory and Applications. Dr Rajender Parsad, Director, ICAR-IASRI, in his introductory remarks explained about the theme of National Science Day 2021- Future of Science, Technology and Innovations: Impacts on Education, Skills and entrepreneurship. A presentation on contribution of Dr. C.V. Raman was also made by students. Dr Seema Jaggi, Professor (Agricultural Statistics) presented vote of thanks.



Open Data Day

11th Anniversary of Open Data Day was celebrated on March 06, 2021. Speakers from Ministry of Health, Open Government Data Platform and ICAR-IASRI graced the occasion and shared their experiences through presentations. Event also witnessed the detailed presentations on ICAR Research Data Management, DARPAN Dashboard, KVK Portal and other portals of Indian Council of Agricultural Research.



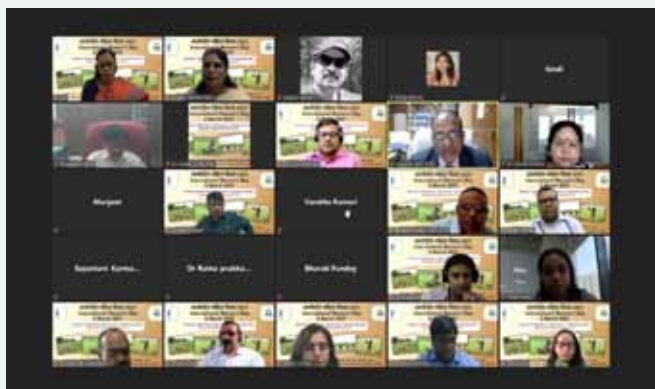
International Women's Day

International Women's Day was celebrated on March 8, 2021 to give a call to action for accelerating gender equity on the theme Women Leadership in Agriculture: Entrepreneurship, Equity and Empowerment.

During the inaugural address, Dr. R.C. Agrawal, Deputy Director General (Agricultural Education), ICAR and National Director (NAHEP) and the Chief Guest expressed his gratitude towards the women working in every field and giving their best not only to make their families flourish but to make the country go ahead with times. He thanked the women farmers for their immense contribution towards saving the genetic and agro-biodiversity and desired that their role should get wider recognition. He appraised the audience about the gross enrolment ratio in universities and the percentage of women in Agricultural Education. Dr. Agrawal elaborated on the steps to achieve sustainable development goals related to gender equality.

Dr. Rajender Parsad, Director, ICAR-IASRI, New Delhi gave his greetings to all on the occasion of International Women's Day. In his introductory remarks, he expressed gratitude to the significant contributions of women and highlighted the percentage of women scientists in ICAR and girl students in Deemed Universities. He emphasized that persistence, perspiration and consistent efforts are the key factors for accelerating the pace of achieving the goals of entrepreneurship, equity and empowerment.

The theme for this year's International Women's Day was "Choose To Challenge". The event witnessed the active involvement of the staff and students who carved beautiful pictures of gender equity and empowerment through their paintings. The paintings also depicted women seeking equal opportunities and equality. A budding in-house poetess used her pen to create a portrait of women, her desire to be treated equal, given equal opportunities and her expectations from the world around.

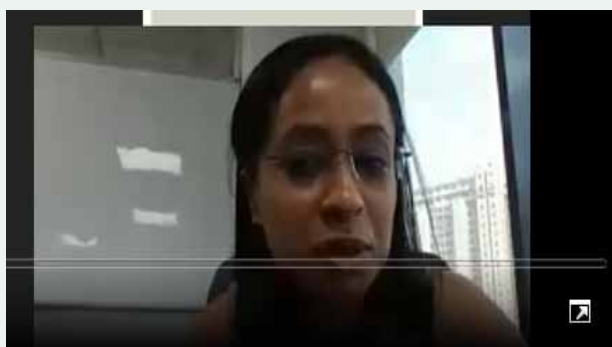


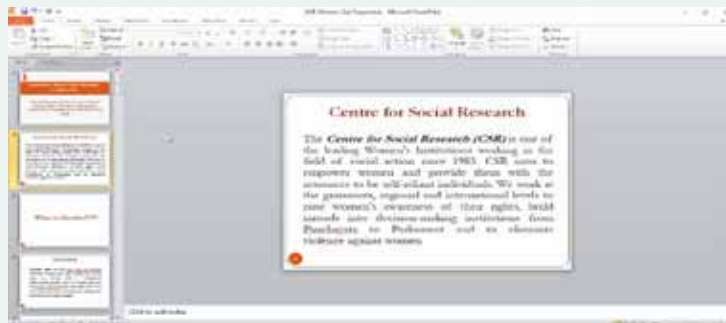
Glimpses of Women Achievers of India



The event was enlightened by the presence of four esteemed speakers Ms. Neetu Singh, Dr. Manasi Mishra, Ms. Vinnie Jauhari and Ms. Milan Sharma. With their illuminating talks and experiences, they all echoed that women are building a future that is sustainable, peaceful, inclusive and equitable. Ms. Neetu Singh talked about how women have risen to the challenge of breaking gender stereotypes in the technology sector. Dr. Manasi Mishra talked about the women empowerment and *beti bachao beti padhao* mission. Ms. Vinnie Jauhari shared her experiences on how the society is working towards building a gender-neutral environment and providing equal opportunities and encouragement to all genders. Ms. Milan Sharma's talk showcased the phenomenal way in which women have taken agriculture to new heights. Incorporating modern science into traditional knowledge base, these women have chosen to challenge all impediments and have emerged victorious. The event was filled with informative entertainment pieces including audio-video presentation showing the Glimpses of Women Achievers of India in different fields, two short videos on women initiatives to deal with climate change and for asking equal opportunity for women in all walks of life were also played. There was a painting competition organized and results were declared. The function ended with a formal vote of thanks. Dr. Seema Jaggi, Dr. Cini Varghese, Dr. Anshu Bharadwaj along with the team of young women scientists Dr. Bharati Pandey, Ms. Sneha Murmu, Ms. Sarika Sahu, Ms. Sanchita Naha and Ms. Madhu Dahiya coordinated the entire International Women's Day 2021 function. The function was held online and was joined by 109 participants.

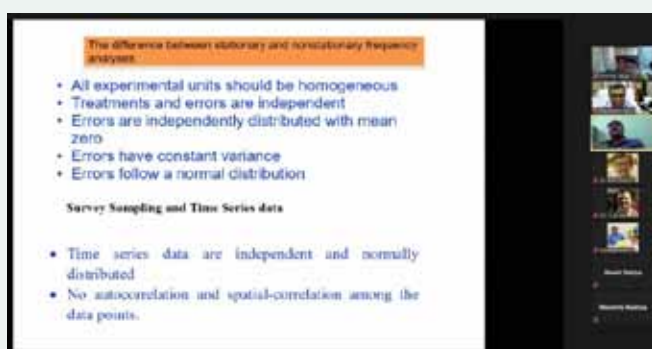
Guest Speakers





World Water Day

World Water Day was celebrated on March 22, 2021. Dr. Dileep Panda, Principal Scientist, ICAR-Indian Institute of Water Management, Bhubaneswar delivered a lecture on **Applications of Statistical techniques in Water Management**. All students and Faculty participated in the celebrations.



Workshop on Evaluation of Improvement of Agricultural Statistics Scheme and Evaluation of Comprehensive Scheme for studying Cost of Cultivation of Principal Crops

One day workshop relating to two studies (i) Evaluation of Improvement of Agricultural Statistics Scheme and (ii) Evaluation of Comprehensive Scheme for studying Cost of Cultivation of Principal Crops was organized in online mode on March 23, 2021. The event was chaired by Dr. Sarbani Guha, Senior Economics and Statistical Adviser, Ministry of Agriculture & Farmers Welfare, Government of India. The project reports were presented before experts from Directorate of Economics and Statistics, Department of Agriculture & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India, Commission for Agricultural Costs & Prices (CACP), National Statistics Office and officials invited from the states.

WORKSHOPS/ WEBINARS/ MEETINGS/ CELEBRATIONS ETC. ORGANIZED

Wokshops/ Webinars

- Workshop-cum Training on Scrutiny of filled-in questionnaires and digitized data, data entry using Data Entry Software and Data Quality for the officials of Horticulture Department, Haryana State, under the project Technical Guidance in Implementation of Methodology for Estimation of Area and Production of Horticultural Crops developed by ICAR-IASRI under CHAMAN Project funded by Haryana State Government on January 18, 2021 (Tauqueer Ahmad, Prachi Misra Sahoo and Ankur Biswas)
- One day online Workshop-cum-Training Programme on Integrated Sample Survey (ISS) App developed for data collection for all the four commodities i.e. milk, meat, egg and wool to the officials of three states namely Karnataka, Jharkhand and Andhra Pradesh for the pilot survey under the project Integrated Sample Survey solutions for major livestock products funded by Animal Husbandry Statistics Division, Department of Animal Husbandry, Dairying & Fisheries, Ministry of Fisheries, Animal Husbandry & Dairying, Govt. of India on January 20, 2021 (Tauqueer Ahmad and Prachi Misra Sahoo)
- Workshop on Website content management using wordpress for AICRP on Plastic Engineering in Agriculture Structures and Environment Management under KRISHI Portal on January 28, 2021 (Rajender Parsad and Arpan Bhowmik)
- One day online training programme on E-Office on February 11, 2021 for the Scientists and Staff working at ICAR-CAFRI Jhansi and PME Cell of ICAR-IASRI. (K.K. Chaturvedi and S.B. Lal)
- Felicitation Function on February 12, 2021 for 22 degree recipients in the disciplines of Agricultural Statistics, Computer Application and Bioinformatics of 59th convocation of PG School, ICAR-IARI.
- All India Training-Cum-Workshop on Web Portal and Android App for Integrated Sample Survey Scheme during February 18-19, 2021 for Master Trainers of Animal Husbandry Statistics Division, Department of Animal Husbandry, Dairying & Fisheries, Ministry of Fisheries, Animal Husbandry & Dairying, Govt. of India. In this online training program, a hands-on training for web portal and data collection App providing end-to-end solution for major livestock products was provided
- Hindi Workshop on “सांख्यिकीय आनुवंशिकी और कृषि में इसके अनुप्रयोग” during March 18-20, 2021 (Samarendra Das and Upendra Kumar Pradhan)

Meetings

- Steering Committee Meeting of the Network Project of Agricultural Bioinformatics and Computational Biology under the Chairmanship of DDG (Agricultural Education), ICAR held on March 09, 2021.

Other Events

- Online Orientation Programme for newly admitted M.Sc. and Ph.D. students in the disciplines of Agricultural Statistics, Computer Application and Bioinformatics on January 08, 2021.
- Session of Significant Research Achievements of Post Graduate Students 2020-21, online Presentations by Professors of Post Graduate School on February 9-10, 2021. (Seema Jaggi as Convener).

Seminars Delivered

A total of 32 seminars in different areas of Agricultural Statistics, Computer Application and Bioinformatics which include presentations on new project proposals, salient findings of the completed research projects and Training undertaken at International level by the Scientists, Course/ Thesis/ ORW Seminars of students of M.Sc. and Ph.D. disciplines of Agricultural Statistics, Computer Application and Bioinformatics were organised. The category-wise break-up is given below.

Category	Type of Seminar	Number
Scientist	Project Completion	2
	New Project Proposal	3
	Foreign Visit	1
	General	1
Student	Course	17
	ORW	5
	Thesis	3
Total		32

PUBLICATIONS

Research Papers

- Barman, S, Basak, P and Chandra, H (2020). Prediction of finite population total for geo-referenced data. *Journal of the Indian Society of Agricultural Statistics*, **74**(3), 195-200.
- Chandra, H (2021). District-level estimates of poverty incidence for the state of West Bengal in India: application of small area estimation technique combining NSSO survey and census data. *Journal of Quantitative Economics*, **19**, 375–391. <https://doi.org/10.1007/s40953-020-00226-8>
- Chandra, H, Aditya, H, Gupta, S, Guha, S and Verma, B (2020). Food and nutrition in Indo Gangetic Plain region -A disaggregate level analysis. *Current Science*, **119**(11), 1783-1788.
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- Guha, S and Chandra, H(2021). Measuring disaggregate level food insecurity via multivariate small area modelling: evidence from rural districts of Uttar Pradesh, India. *Food Security*, **13**, 597–615. <https://doi.org/10.1007/s12571-021-01143-1>
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- Guha, S and Chandra, H (2021). Improved estimation of finite population mean in two-phase sampling with sub-sampling of the non-respondents. *Mathematical Population Studies*, **28**(1), 24-44. <http://krishi.icar.gov.in/jspui/handle/123456789/35413>
- Harun, M, Varghese, C, Jaggi, S and Varghese, E (2021). Robust designs involving partial trial crosses for breeding experiments. *International Journal of Ecology and Environmental Sciences*, **3**(1), 36-41.
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Book Chapters

- Angadi, UB, Animut, G, Anandan, S, Blümmel, M, Moyo, S Rahman, H and Jones, C (2021). FeedBase Ethiopia: The Role of Database in Developing Livestock Feed in proceedings of India–Africa Partnerships for Food Security and Capacity Building South–South Cooperation. In: Modi, Renu, Venkatachalam, Meera (Eds.), in series of International Political Economy Series, Springer Nature Switzerland AG.
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- Mrunalini, K, and Deb, Chandan K (2021). Drones in Agriculture. In: *Digital Technologies in Agriculture*: Eds. Surya Rathor, Vijay Lakshmi B. and V.V. Sumanth Kumar. Biotech Books, New Delhi.171-182.

E-Resources/E-Publication/E-Manual/E-Book/Brochure/ Pamphlet Developed

SAS Macro Developed

- Harun, M, Varghese C, Jaggi, S, and Varghese, E (2020). SAS MACRO for Generation of Partial Triallel Cross Design using Triangular Association Scheme. Available at: <http://krishi.icar.gov.in/jspui/handle/123456789/44525>
- Harun, M, Varghese C, Jaggi, S and Varghese, E (2020). SAS MACRO for Generation of Partial Tetra-allele Cross Design using MOLS. Available at: <http://krishi.icar.gov.in/jspui/handle/123456789/44535>

Project Reports

- Harun, M, Datta, A, Varghese, C and Jaggi, S (2020). Designs Involving Three-way and Four-way Genetic Crosses for Crop and Animal Breeding Programmes. Project Report. ICAR-IASRI Publication. IASRI/PR-09/2020. <http://krishi.icar.gov.in/jspui/handle/123456789/44651>
- Datta, A, Harun, M, Jaggi, S, Varghese, C and Bhowmik, A (2020). Generalized Row-Column Designs for Crop and Animal Experiments. Project Report. ICAR-IASRI Publication. IASRI/PR-05/2020. <http://krishi.icar.gov.in/jspui/handle/123456789/44867>

Technical Bulletin

- Chandra,H, Parsad,R, Ahmad,T, Bhar,LM, Aditya,K, Kumari,V and Basak, P (2021). Evaluation of Agricultural Census Scheme. ICAR-Indian Agricultural Statistics Research Institute, New Delhi. I.A.S.R.I./T.B.-1/2021.

PAPERS PRESENTED/LECTURES DELIVERED

Papers presented / Invited talks delivered in Conferences

- International virtual Seminar on **Artificial Intelligence in Agriculture** organized by Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, UP during January 11-12, 2021.
 - ♦ Alka Arora*. Applications of AI techniques in Image analysis for phenotypic characteristics of wheat (Invited Talk)
- 33rd Annual function of National Environmental Science Academy, New Delhi and National Virtual Conference on **Techno-scientific Challenges and Sustainable Solutions for Living Beings during Changing Environment** (TCSE-2021) during January 29-30, 2021 organized jointly by NESI and ICAR-IASRI, New Delhi. (in Technical session on “Statistics and Informatics for Sustainable Solutions during Environment Change”)
 - ♦ Tauqueer Ahmad. Contribution of ICAR-IASRI to the Sustainable Development Goal (SDG)-12.3 at international level in strengthening India’s role towards SDGs. (Keynote Talk)
 - ♦ Sudeep. IT Initiatives in Agriculture by ICAR-IASRI. (Keynote talk)
 - ♦ Ramasubramanian V., Appaji Pundalik Naik and Mrinmoy Ray. Multi-Dimensional Scaling (MDS) based solutions for prioritizing technological challenges in Plant Breeding and Genetics. (Invited talk)
 - ♦ Alka Arora. KVK Portal and Mobile App: ICT Tools for Knowledge Dissemination Towards Farming Community by Krishi Vigyan Kendras across India.(Invited talk)

- ◆ Shashi Dahiya. AI for Combating Climate Change in Agriculture (Invited talk)
 - ◆ S.N. Islam. Expert System Shell for developing Multi crop Expert Systems. (Invited talk)
 - ◆ Ranjit Paul. Forecasting Sub-Divisional Rainfall in India using Wavelets and Machine Learning Approach. (Invited talk)
 - ◆ Soumen Pal. Visualization and Analysis of Landscape Diagnostic Survey Data under Cereal Systems Initiative for South Asia. (Invited Talk)
 - National Conference on **Visionary Innovations in Statistical Theory and Applications (VISTA-2021)** in conjunction with 23rd Annual Conference of the Society of Statistics, Computer and Applications (SSCA) organized by the ICAR - National Academy of Agricultural Research Management (NAARM), Hyderabad, during February 24-28, 2021.
 - ◆ Rajender Parsad. HRD in Statistical Sciences: Current Status and Challenges.(Plenary Talk) B.N. Mandal. Incomplete block designs with constant block-sums.(Invited talk)
 - ◆ Shashi Dahiya* and Sudeep. An E-Learning Framework for Agricultural Higher Education in India. (Invited talk)
 - ◆ Alka Arora. Applications of AI Techniques for Plant Phenotypic Characteristics.(Invited talk)
 - ◆ H. Chandra*, and S. Guha. Small Area Estimation under Spatial Multivariate Fay–Herriot Model. (Invited Talk).
 - ◆ D.C. Mishra. Innovations in Genomic Selection: Statistical Perspective. (Invited talk)
 - ◆ K.K. Chaturvedi. Applications and Opportunities of Big Data in Agriculture (Invited talk)
 - ◆ S. Guha* and H. Chandra. Multivariate Small Area Models for Measuring District Level Income Inequality: Evidence from Periodic Labour Force Survey Data.
 - ◆ R. Kumar*, A. Biswas, D. Singh, L.M. Bhar and T. Ahmad. Linear Regression Influence Diagnostics in Presence of Masking for Unclustered Survey Data.
 - ◆ Ramasubramanian V.*, Appaji Pundalik Naik, Mrinmoy Ray, Shashi Dahiya and Lal Mohan Bhar. Fuzzy based classification tree modelling in agricultural ergonomics (Invited talk)
 - ◆ Mukesh Kumar. Agricultural Mobile Apps: An Overview. (Invited talk)
 - National Conference on **Priorities in Crop Protection for Sustainable Agriculture** jointly organized by Directorate of Extension Education, CAU, Imphal and ICAR-National Bureau of Agricultural Insect Resources, Bengaluru during March 16-18, 2021
 - ◆ S.H. San, D. Sagar*, V. Krishnan, M. Awana, A. Singh, and A.Bhowmik. Antioxidant defense system in chickpea in response to gram pod borer, *Helicoverpaarmigera* (Hubner)
 - Online International Symposium on Coastal Agriculture (ISCA Webinar): **Transforming Coastal Zone for Sustainable Food and Income Security** organized by Indian Society of Coastal Agricultural Research in Collaboration with ICAR-CSSRI, Karnal during March 16-19, 2021
 - ◆ Peter T. Birteeb*, Cini Varghese and Seema Jaggi. Development of selection index for Agroforestry Systems.
 - **56th Annual Group Meeting on AICRP on Pearl Millet** organized online by ICAR-All India Coordinated Research Project on Pearl Millet, Jodhpur during March 22-23, 2021.
 - ◆ Rajender Parsad*, Sukanta Dash and A. Dhandapani. Automation System for AICRP on Pearlmillet (invited Talk in the session on New Initiatives)
- {*denotes the author who presented the paper}

Lectures Delivered (Outside Institute)

- ‘Machine learning for Time Series Analysis’ in online training programme on Time Series Data Analysis during January 04-09, 2021 organized by ICAR-NAARM, Hyderabad. (Mrinmoy Ray)
- ‘Nonlinear Time Series Models (ARCH group of models)’ in Online Training Programme on Time Series Data Analysis during January 04-09, 2021 organized by ICAR-NAARM, Hyderabad. (RanjitKumar Paul)
- Four lectures on ‘(i) Downloading and Installing in R, Import/ Export data in R (ii) Descriptive Statistics, Graphics, (iii) Statistical Tests in R Probability Distribution & Statistical Modeling in R (iv) Writing Function in R & Simulation in R’ in the Faculty Development Programme on Exploratory Data Analysis using Statistical Software System R and SPSS at Mata Sundri College for Women, Delhi University, Delhi during January 7-13, 2021.(Hukum Chandra)

- ‘Machine Learning Techniques in Climate Change Perspective’ in Webinar on AI in Agriculture organized during January 11-12, 2021 by SVUAT Modipuram, Meerut. (Shashi Dahiya)
- ‘Application of Bioinformatics tool for NGS Data Analysis’ in the online training programme Basic and Applied Bioinformatics in Animal Sciences on February 11, 2021 organized by Bioinformatics Centre of ICAR-Indian Veterinary Research Centre under aegis of CAAST-ACLH project of NAHEP.(Sudhir Srivastava)
- ‘Significance of Experimental Designs and Web Resources in Agricultural Research’ in the Training Programme on Analysis of Experimental Data in Post Graduate Research organized by Skill Development Centre and Department of Agricultural Statistics, Applied Mathematics and Computer Science, University of Agricultural Sciences, Bangalore during February 15-20, 2021). (Rajender Parsad: Inaugural Talk)
- ‘Survey Methods and Sampling’ in the Ten-Day Online Workshop on Research Methodology for M. Phil, Ph.D and Postdoctoral Scholars in Social Sciences at Madras Institute of Development Studies, Chennai during 15–26 February 2021.(Hukum Chandra)
- ‘Recent Developments in Statistical Modelling and Methodology’ in UGC Refresher Course at NEHU Sillong on Categorical Data Analysis in Sample Surveys on February 16, 2021. (Anil Rai)
- Two lectures on ‘(i) Descriptive statistics and exploratory data analysis (ii) MS-EXCEL: Statistical Procedures’ in a two-day workshop on Experimental Data Analysis organized by Department of Food Technology, Shaheed Rajguru College of Applied Sciences for Women, University of Delhi during February 18-19, 2021. (Cini Varghese)
- ‘Factorial Experiments and Split and Strip Plot Designs’ in a two-day workshop on Experimental Data Analysis organized by Department of Food Technology, Shaheed Rajguru College of Applied Sciences for Women, University of Delhi during 18-19 February 18-19, 2021.(Arpan Bhowmik)
- Six lectures on (i) Metagenomics data standards and submission, (ii) Quality check and processing of raw metagenomics NGS data, (iii) Metagenome assembly; (iv) Functional annotations, taxonomic identification using 16S rDNA and WGS data, (v) Web Genomic Resources for Metagenomics Studies and (vi) Computational Resources for Metagenomics Studies’ at TEQIP (Technical Education Quality Improvement Programme) during Feb 23-27, 2021 Organized by IIT-G (<https://www.iitg.ac.in/>) under World Bank Funded training programme entitled “Environmental Genomics and Genome Editing” (http://www.iitg.ac.in/env/teqip_ub/index.html) (MA Iquebal)
- ‘Climate Change: Impact on Livestock and Role of Genomics and Bioinformatics in Resilience Improvement’ at TEQIP (Technical Education Quality Improvement Programme) during 23-27 Feb 2021 Organized by IIT-G (<https://www.iitg.ac.in/>) under World Bank Funded training programme entitled “Environmental Genomics and Genome Editing” (http://www.iitg.ac.in/env/teqip_ub/index.html) (Dinesh Kumar)
- ‘Statistical Approach for Producing Agricultural Statistics in India’ during Statistics Fest on the occasion of National Science Day celebrations, Symbiosis Statistical Institute, Pune on March 02, 2021.(Hukum Chandra: Keynote Speaker)
- ‘Small Area Prediction of Counts under a Spatial Non-Stationary Generalized Linear Mixed Model’ at Department of Statistics seminar series of the Iowa State University, United States on March 08, 2021.(Hukum Chandra)
- ‘MISA-tool for Genome-wide Microsatellite Sequence Prediction’ in Faculty Training on Skill Development on Advanced Bioinformatics in Genome Analysis of Livestock and Pets organized by The College of Animal Biotechnology, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana during March 05-25, 2021 (M A Iquebal)
- ‘Gene Expression Analysis through Transcriptomics’ in Faculty Training on Skill Development on Advanced Bioinformatics in Genome Analysis of Livestock and Pets organized by The College of Animal Biotechnology, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana during March 05-25, 2021(Sarika)
- ‘Application of Big-data and Artificial Intelligence in Genomic Data Analysis’ in Faculty Training on Skill Development on Advanced Bioinformatics in Genome Analysis of Livestock and Pets organized by The College of Animal Biotechnology, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana during March 05-25, 2021.(Dinesh Kumar)
- ‘Introduction to R software for Statistical Analysis’ in short training course on Analytical Techniques for Impact Assessment of Agricultural Technologies & Policies”–from March 17-27, 2021 at the Division of Agricultural Economics, ICAR-IARI, New Delhi. (Ranjit Kumar Paul)

- Two lectures on ‘Statistical Techniques & Use of R Programming’ in three days training programme on Statistical Tools and Data Analysis Using Software organized by Department of Statistics, M.D. University, Rohtak during March 24-26, 2021 (March 24, 2021). (Hukum Chandra)

PARTICIPATION

National Conference/ Workshop/ Seminar/ Symposia/Annual Day/ Lectures, etc. Participated

- Online meeting of Peer Review Team of NAEAB, ICAR for Accreditation of ICAR-IARI held on January 23, 2021. (Seema Jaggi)
- Online Training Programme on ‘Blockchain Technologies and Applications’ organized by JIT, Noida during December 28, 2020-January 02, 2021. (Alka Arora)
- The discussion meeting on National Agricultural Education Policy on February 01, 2021 held at NASC Complex. (Seema Jaggi)
- Training Workshop on Multi-dimensional approaches for sustaining food and nutritional security Conducted under Career Development Centre activities at SVVU, Tirupati during 04-05 February 2021. (Anshu Bharadwaj)
- Training Workshop on Aflatoxin analysis for food safety- Training Conducted under Career Development Centre activities at SVVU, Tirupati on February 05, 2021. (Anshu Bharadwaj)
- Hands-on Training Cum Workshop on Developing Presentation Skills among PG students using Power Point through online mode under Career Development Centre activities at SKNAU, Jobner on February 07, 2021. (Anshu Bharadwaj)
- 24th workshop of ICAR- All India Coordinated Research Project on “Energy in Agriculture and Agro-based Industries”, ICAR-CIAE, Bhopal during February 09-11, 2021 (Online). (Hukum Chandra and Vandita Kumari)
- Training Workshop on Recent advances in Animal Feeding to maximize productivity and health of domestic animal under Career Development Centre activities at SVVU, Tirupati during February 15-19, 2021. (Anshu Bharadwaj)
- Training Workshop on Beyond the boundaries. Opportunities for veterinary graduates in various fields conducted under Career Development Centre activities at SVVU, Tirupati on February 18, 2021. (Anshu Bharadwaj)
- Training Workshop on ARC HPLC More options for Chromatographic separations under Career Development Centre activities at SVVU, Tirupati on February 18, 2021. (Anshu Bharadwaj)
- Virtual workshop of Geo Spatial data and different initiative in this aspect on February 19, 2021 organized by Ministry of Earth Science. (Arpan Bhowmik)
- Pusa Krishi Vigyan Mela 2021: held at IARI mela ground, New Delhi during February 25-27, 2021. Institute displayed attractive posters about the latest research methodologies and web applications developed like KVK portal and KVK Mobile App for the farmers, general visitors, researchers and students to give them adequate information about the institute. Nearly 300 visitors including students, farmers, Government and non-govt. agencies visited the stall. Booklet & Pamphlets were distributed to the visitors. (Prawin Arya, Ajit, BN Mandal, Susheel Kumar Sarkar, Soumen Pal, Sukanta Dash, Deepak Singh, Mohammad Samir Farooqi, Chandan Kumar Deb, Neeraj Budhlakoti, Rajeev Ranjan Kumar, Samarth Godara, Harish Kumar, HV, Raghubir Singh)
- Online National Workshop on Mainstreaming of Agricultural Higher Education: Problems and Prospects of General and Private Universities Under NAHEP during February 26-27, 2021. (Rajender Parsad, Sudeep, Alka Arora, Anshu Bharadwaj)
- India-Luxembourg Agriculture cooperation on March 18, 2021. (Anil Rai).

HUMAN RESOURCE DEVELOPMENT

- Training Programs Organized: 07 (Participants: 490)**

S.N.	Title	Venue	Period	Number of Participants
1.	Software and Tools in Bioinformatics <i>Course Directors:</i> U.B.Angadi K.K. Chaturvedi	ICAR-IASRI, New Delhi (Online)	11.01.2021 To 13.01.2021	20
2.	Statistics and Informatics for Experimental Data Management and Analysis (sponsored by NAHEP-CAAST project of ICAR-IARI, New Delhi). <i>Course Directors</i> Seema Jaggi, Sudeep <i>Course Coordinators</i> Anindita Datta, Soumen Pal and Sanjeev Kumar	ICAR-IASRI, New Delhi (Online)	23.02.2021 To 04.03.2021	140 (Research scholars from different ICAR institutes, SAUs and CAUs)
3.	Recent Advances of Statistical Analysis in Agriculture (in collaboration with Assam Agricultural University). <i>Course Directors:</i> B.N. Mandal Sukanta Dash and Borsha Neog (Assam Agricultural University)	ICAR-IASRI, New Delhi	04.03.2021 To 12.03.2021	24 (Faculty from Assam Agricultural University, Jorhat)
4.	Statistics for Social Science Scholars of ICAR-CIFE, Mumbai. <i>Course Co Ordinators</i> Susheel Kumar Sarkar Ramasubramanian V. Upendra K. Pradhan	ICAR-IASRI, New Delhi (online)	23.02.2021 To 22.03.2021	23 (M.F.Sc./ Ph.D. students)
5.	Designs of experiments and Next Generation Sequencing Data Analysis for Scientists from ICAR-National Institute of Biotic Stress Management, Raipur. <i>Course Coordinators</i> <i>ICAR-IASRI:</i> Mir Asif Iquebal and BN Mandal <i>ICAR-NIBSM:</i> SK Jain	ICAR-IASRI, New Delhi (Online)	16.03.2021 To 17.03.2021	20
6.	Advanced Designs for Product and Process Development Oriented Experiments (in Collaboration with Division of Agricultural Chemicals, ICAR-IARI, New Delhi) <i>Course Directors: ICAR-IASRI:</i> Sukanta Dash, Anil Kumar; <i>ICAR-IARI:</i> Anupama Singh		16.03.2021 To 17.03.2021	97
7.	Next Generation Sequence Data Analysis” for Contractual staff such as RA/SRF/JRF/YPs working in research projects at NARES institutions <i>Course Coordinators:</i> Sanjeev Kumar, D.C. Mishra and K.K. Chaturvedi	ICAR-IASRI, New Delhi (Online)	22.03.2021 To 27.03.2021	176

Training/Foundation Course Attended

- Five-day online training program on Online Foundation Course on Cyber Security during January 4-8, 2021 organized/ facilitated by Cyber Security Division, Ministry of Electronics and Information Technology (MeitY) and C-DAC Hyderabad. (Mukesh Kumar, KK Chaturvedi, SB Lal and Sanjeev Kumar)
- Online Training Programme on Introduction to NVIDIA GPU Server Resources - AI Tools and Techniques during January 11-16, 2021.(Ramasubramanian V. and Soumen Pal)
- Online training programme on ‘Geo-informatics in agriculture using open-source data and analysis platforms’ organized by Division of Agricultural Physics, ICAR-IARI, New Delhi during March 1-5, 2021.(Rajeev Ranjan Kumar)
- Online Training Programme on “Applications of Artificial Intelligence and Cloud Computing in Agriculture” organized by ICAR-NAARM, Hyderabad during March 15-20, 2021.(Ratna Prabha)

CONSULTANCY/ADVISORY SERVICES PROVIDED

- M.A. Iquebal advised (i) Dr. SS Dey, Senior Scientist, ICAR-IARI regarding RT-PCR primer generation and data analysis and (ii) Dr. Zakir Hossain, Principal Scientist, IARI regarding primer generation and adat analysis of SSR markers for validation.
- Sarika advised (i) Dr. A. Ghosh, Scientist, ICAR-IARI regarding transcriptome sample designing and data generation. Also discussed the quality aspects and (ii) Dr. S. Yadava, Principal Scientist, ICAR-IARI regarding primer generation of SSR markers for validation for seed testing purpose.
- D.C. Mishra advised (i) Dr. Gyan Mishra, Senior Scientist, ICAR-IARI, regarding transcriptome data analysis; (ii) Dr. Harshvardhan Chaudhary, Principal Scientist, ICAR-IARI regarding SNP data analysis; (iii) Dr. Navin Chandra Gupta, Scientist, NIPB, regarding secretome data analysis.
- Arpan Bhowmik advised Dr. Tapan Jyoti Purakayastha, Principal Scientist, Division of Soil Science and Agricultural Chemistry, ICAR-IARI on the use of Principal component analysis to identify important soil biological and chemical properties for acidic Alfisol soil order based on 9 treatments viz. T1-RS + RSBC (7:1), T2-RS + GRBC (7:1), T3-RS + GRBC (9:1), T4-RS + GRBC (11:1), T5-MS + GRBC (7:1), T6-MS + GRBC (11:1), T7-RSBC, T8-MSBC, T9-GRBC, T10-2/3rd LR, T11-Control where RS– Rice straw; MS– Maize stover; RSBC– Rice straw biochar; MSBC– Maize stover biochar; GRBC– Gram residue biochar; LR– Lime requirement; Exc.– Exchangeable. Based on the PCA results, biplot has also been obtained. Beside, similarity studies of different treatments as mentioned above was also carried out using important soil biological and chemical properties.
- Ramasubramanian V. advised Dr. Latha Shenoy, Former Principal Scientist, ICAR-CIFE, Mumbai regarding analysis to study the effect of unequal numbers of male and female fisher households on community participation.
- Raju Kumar advised Dr. Nirupma Singh, Senior Scientist, Division of Genetics, ICAR-IARI for analysis of the data for Evaluation of Trichoderma isolates as potential biological control agent against *Macrophomina phaseolina* a causal agent of charcoal rot in maize.
- Achal Lama advised Mr. Neeraj Biswakarma, Ph.D.(Agronomy) scholar, ICAR-IARI for analyzing data sets on rice-wheat rotation farming using appropriate experimental design (RCBD and pooled) and PCA.
- U.K. Pradhan advised Mr. Subrat Keshori Behera, Assistant Professor, Bihar Agricultural University in developing forecast model using ARIMA, ARIMAX, ANN and NARX for forecasting of crop yield in five different crops (Rice, wheat, Maize, Arhar and Gram).

AWARDS AND RECOGNITIONS

Awards

- Sukanta Dash and Rajeev Ranjan Kumar received Young Scientist Award during International Web Conference on Global Research Initiative for Sustainable Agriculture and Allied Sciences organized by ASTHA Foundation, Meerut, U.P, India.

- Pankaj Das received “InSc Young Researcher award 2020”.: Institute of Scholars (InSc) is a technical professional organization that is ISO 9001:2015 certified and accredited by UASL (registered under the Ministry of Micro, Small and Medium Enterprise (MSME) and Corporate Affairs, Government of India). InSc Young Researcher Award is a multidisciplinary award. The award is given on the quality of research work published in reputed national or international research journals.
- Neeraj Budhlakoti received IARI Merit medal award from the discipline of Bioinformatics at 59th convocation of ICAR-IARI held on February 12, 2021.

Recognitions

- RajenderParsad
 - ♦ Chaired a Technical Session during National Virtual Conference on Techno-Scientific Challenges and Sustainable Solutions for Living Beings during Changing Environment (TCSE-2021) organized Jointly by NESAI, ICAR-IASRI, New Delhi and NAHEP-ICAR during January 29-20, 2021 at ICAR-IASRI, New Delhi.
 - ♦ Guest of Honour during Inaugural Session and Valedictory session of the Conference 33rd Annual Function of National Environment Science Academy and National Virtual Conference on Techno-Scientific Challenges and Sustainable Solutions for Living Beings during Changing Environment (TCSE-2021) organized Jointly by NESAI, ICAR-IASRI, New Delhi and NAHEP-ICAR during January 29-20, 2021 at ICAR-IASRI, New Delhi.
 - ♦ Chaired M.N. Das Memorial Young Scientist Award Presentation Session during the web conference on Visionary Innovations in Statistical Theory and Applications (VISTA 2021) organized by ICAR- NAARM, Hyderabad in conjunction with 23rd Annual conference of Society of Statistics, Computer and Applications during February 24-28, 2021.
- Anil Rai
 - ♦ Expert member of a National level Committee on Mission Mode in the domain of Precision Agriculture constituted by CSIR under the Chairmanship of Ex- Secy (DARE) and DG ICAR.
- Tauqueer Ahmad
 - ♦ Nominated as External member, Board of Studies (BOS) of Department of Statistics and Operations Research, Aligarh Muslim University (AMU), Aligarh under Statute 22(l)(v) of the Statutes of the University for a period of two years w.e.f. 04.01.2021.
- Hukum Chandra
 - ♦ Expert Member, Committee to bridge the data gaps for Sustainable Development Goals (SDGs) indicators through Small Area Estimation techniques, Ministry of Statistics and Programme Implementation, Government of India.
 - ♦ Co-Chaired, Session on Progress Reports of the Energy Management in Agriculture (EMA) Component for 2020-21 and Proposal of Technical Programme for 2021-22 during the XXIV workshop of ICAR- All India Coordinated Research Project on “Energy in Agriculture and Agro-based Industries” on 09 February, 2021.
 - ♦ Associate Editor, Journal of the Indian Society for Probability and Statistics (Springer).
 - ♦ Panel of Judge, Indian Society for Probability and Statistics (ISPS) Young Scientist Awards 2020 on March 13, 2021.
- B.N. Mandal
 - ♦ Chaired a session of contributed talks in (online)Session during the web conference on Visionary Innovations in Statistical Theory and Applications (VISTA 2021) organized by ICAR- NAARM, Hyderabad in conjunction with 23rd Annual conference of Society of Statistics, Computer and Applications during February 24-28, 2021.
- Kaustav Aditya
 - ♦ Editorial board member of peer reviewed open access Journal Agrotechnology with TR impact factor 0.69.
- M.A. Iquebal
 - ♦ Member, Editorial Board, International Journal of Genetics and Genomics

NEW PROJECTS/ SCHEMES/ PROGRAMME/ CENSUS/ SAMPLE SURVEYS/ EVALUATION STUDIES/ SOFTWARE DEVELOPED/ INITIATED/ COMPLETED

Initiated

- ‘Study on domain calibration estimator under two stage sampling design’ w.e.f. January 18, 2021. (Kaustav Aditya, Vandita Kumari and Hukum Chandra).
- ‘Assessing Genetic Variability in Duck of Eastern States’ in collaboration with ICAR-RCER w.e.f. February 08, 2021 (Ratna Prabha)
- ‘Biomass and Carbon Mapping Across Altitudinal Gradient of Major Darjeeling and Sikkim Himalayan Land Uses: Implications for Carbon Sink Management and Mitigation’ funded by Science and Engineering Research Board (SERB), DST, GOI has been initiated w.e.f. February 10, 2021 (Arpan Bhowmik and Ankur Biswas)
- ‘Forecasting Onion Prices Using Deep Learning Techniques’ w.e.f. February 20, 2021 (PI: Kanchan Sinha, KN Singh, Mrinmoy Ray and Harish Kumar HV).
- Technical Guidance on the sampling strategy and developing sampling methodology for 2019/20 Lao Agriculture Census” under Institutional Consultancy Project w.e.f. February 27, 2021.
- ‘Development of Artificial Intelligence Framework for Prediction of Protein 3D Structure” b. Project started on March 16, 2021 (UB Angadi, KK Chaturvedi and Sudhir Srivastava)

Completed

- A project entitled “Evaluation of Improvement of Agricultural Statistics Scheme” funded by DES, Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Govt. of India has been completed on February 28, 2021.

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S.No.	Title	Authors	Registration Number	Received Date
1	Management Information System of Direct Benefit Transfer schemes(MIS-DBT): (in Collaboration with Krishi Education Division, ICAR, New Delhi)	Soumen Pal, Alka Arora, Sudeep, Nidhi Verma and P. S Pandey	SW-14087/2021	08.01.2021

PERSONNEL

Congratulations on New Joining

Name	Designation	Effective Date
Dr. Md Yeasin	Scientist	11.01.2021
Dr. (Ms.) Bharti Pandey	Scientist	11.01.2021
Ms. Soumya Sharma	Scientist	12.01.2021
Ms. Ritwika Das	Scientist	12.01.2021
Ms. Sneha Murmu	Scientist	12.01.2021

Congratulations on your Promotion/ New Assignment

Name	Designation	Effective Date
Dr. Dwijesh Chandra Mishra	Senior Scientist (Level 12)	15.12.2018
Sh. Upendra Kumar Pradhan	Scientist (Level 11)	01.01.2018
Dr. Kanchan Sinha	Scientist (Level 11)	01.01.2018

Dr. Samarendra Das	Scientist (Level 11)	01.01.2018
Dr. Mrinmoy Ray	Scientist (Level 11)	01.07.2018
Sh. Rakesh Kumar Saini	Chief Technical Officer (advance increment)	01.01.2020
Sh. Devender Kumar	Chief Technical Officer (advance increment)	01.01.2020
Ms. Rajni Bala Grover	Chief Technical Officer	01.01.2019
Sh. Udai Vir Singh	Assistant Chief Technical Officer	01.01.2013
Sh. Jai Bhagwan	Assistant Chief Technical Officer	27.08.2019
Sh. Virender Kumar	Assistant Chief Technical Officer	15.09.2019
Ms. Laxmi Devi	Private Secretary	22.03.2021
Sh. Yashraj Nagar	Lower Division Clerk	22.02.2021
Sh. Shyam Swaroop	Lower Division Clerk	22.02.2021

Wish you a Happy Retired Life

Name	Designation	Effective Date
Sh. Mohan Singh	Technical Officer	28.02.2021
Sh. Hari Lal Rai	Technical Officer	28.02.2021
Ms. Meenu Kohli	Private Secretary	01.03.2021
Ms. Vijayalakshmi Murthy	Private Secretary	31.03.2021

Transfer/ Resignation

Name	Designation	Effective Date
Dr. (Ms.) Anuja, A. R.	Scientist	Transferred to ICAR-CMFRI, Kochi w.e.f 25.01.2021

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