ICAR-IASRI

NEWS

Volume 25   No. 1   **April-June, 2020**

- **Research Activities**
- **Awards and Recognition**
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From Director's desk……………

This Newsletter is a compilation of the key research achievements, awards and recognitions received, training programmes conducted, workshops and conferences organized/ attended, advisory services provided and significant publications of our Institute during the period under report. It is worth mentioning that most of the period being reported pertains to lockdown due to COVID-19 and even then our Scientists have contributed immensely by adapting to the changing times.

An R-package BayesARIMA to estimate the ARIMAX model using Bayesian framework has been developed. A machine learning-based method for prediction of Gigantea proteins has been developed. A supervised learning-based methodology ASRpro for multi-label prediction of abiotic stress responsive proteins has also been developed. An online software Web generation of Generalized Row-Column Designs (WebGRC) has been developed. Algorithm of Multiple Kernel Extreme Learning Machine (MK-ELM) for drought index forecasting and procedure for estimation of the parameter of the Multiple Kernel Extreme Learning Machine (MK-ELM) has also been developed.

Our Scientists have brought recognitions to our institute by way of serving as Expert Members in various high-level committees, delivering invited talks in prestigious forums. Two training programmes were conducted on topics viz., Statistics: Experimental Designs and Analysis and Data Science in Agriculture. Orientation training for newly joined 11 scientists in the institute was also conducted during this period.

Two new externally funded projects have been initiated during the period. A good number of publications have come out during this period. R packages for calculation of Signatures from Genomic Sequences for prediction of circadian proteins encoded by circadian genes (PredCRG) and Bayesian Estimation of ARIMAX Model (Bayes ARIMAX) have been developed. Web servers have also been hosted on "GIpred" for the prediction of GIGANTEA proteins, "miRNALoc" for predicting localization of miRNAs. A database "FMDISC", which is an information system on Foot and Mouth disease of cattle has also been developed during the period. Our Scientists have also attended many workshops and conferences (mostly in virtual

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mode owing to lockdown and other restrictions), besides delivering their work in the form of presentations in them.

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

(Tauqueer Ahmad)

RESEARCH ACHIEVEMENTS

An R-package "**BayesARIMA**" to estimate the ARIMAX model using Bayesian framework has been developed and is available athttps://CRAN.R-project.org/package=BayesARIMAX.

A machine learning-based method for prediction of GIGANTEA proteins has been developed. Based on the proposed model, the web server "**GIpred**" has been established which is accessible at http://cabgrid.res.in:8080/gipred/.

A supervised learning based methodology named as "**ASRpro**" for multi-label prediction of abiotic stress responsive proteins has been developed and is available online at https://github.com/meher861982/ASRpro.

An online software Web generation of Generalized Row-Column Designs (**WebGRC**) has been developed. Computer modules for generating four series of structurally incomplete GRC designs along with randomized layout have been developed.

Algorithm of Multiple Kernel Extreme Learning Machine (**MK-ELM**) for drought index forecasting and procedure for estimation of the parameter of the Multiple Kernel Extreme Learning Machine (MK-ELM**)** has been developed.

RECOGNITIONS

- Anil Rai
  - Officiating as ADG-ICT in ICAR, New Delhi
  - Professor of Bioinformatics in P.G. School, IARI New Delhi.
  - Member of organization of Governing Body meeting of ICAR, New Delhi.
  - Member of organization of Regional Committee-I meeting of ICAR, New Delhi.
  - Member of ICAR Web-site Committee under the Chairmanship of DDG (Ag. Edn).
  - Member of the Committee for conducting online interviews by ASRB, New Delhi.
  - Expert member of Working Group constituted for the design and development of the IDEA Blueprint by Ministry of Agriculture and Farmers Welfare, New Delhi.
  - 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.

- Hukum Chandra
  - Invited Speaker in the National Workshop on "Research Methodology: Concepts & Applications" at Maharana Pratap University of Agriculture and Technology, Udaipur during 26-27 June, 2020.

- Co-Chairman, Institute Annual Report Editorial Committee, 2019.
- Reviewed Ph.D. thesis on the topic "Bayesian Modeling of Reliability and Survival Analysis for Censored Data" of Ms. Teena Goyal for the award of Ph.D. Degree of the Banasthali Vidyapith, Rajasthan.

- Ramasubramanian V.
  - Chairman, Institute Annual Report Editorial Committee, 2019.

HUMAN RESOURCE DEVELOPMENT

Training programs organized:

S.N.	TITLE	VENUE	PERIOD
1.	**Statistics: Experimental Designs and Analysis** *Course Director* Seema Jaggi	**Afghanistan National Agricultural Sciences and Technology University (ANASTU), Kandahar & ICAR-IARI, New Delhi (Online Mode)**	**13.04.2020 To 08.05.2020**
2.	**Data Science in Agriculture** *Course Coordinators* Sudeep Anshu Bharadwaj Soumen Pal	**ICAR-IASRI, New Delhi (Online Mode)**	**26.05.2020 To 31.05.2020**

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

The following new research projects initiated by Dinesh Kumar, M.A. Iquebal and Sarika:

- Germplasm Characterization and Trait Discovery in Wheat using Genomics Approaches and its Integration for Improving Climate Resilience, Productivity and Nutritional quality funded by Department of Biotechnology, Government of India initiated on April 01, 2020 for a duration of five years.
- Mainstreaming rice landraces diversity in varietal development through genome wide association studies: A model for large-scale utilization of gene bank collections of rice funded by Department of Biotechnology, Government of India initiated on May 01, 2020 for a duration of five years.

- R package for calculation of Signatures from Genomic Sequences (Anu Sharma, S.B. Lal, Sanjeev Kumar, Dwijesh Chandra Mishra and Sudhir Srivastava) developed.

- P.K. Mehar
  - Developed an R-package "PredCRG" for prediction of circadian proteins encoded by circadian genes. The package is available at https://cran.r-project.org/web/packages/PredCRG /index.html.
  - Developed a web server "GIpred" for the prediction of GIGANTEA proteins. The server is freely accessible at http://cabgrid.res.in:8080/gipred/.
  - Developed a web server "miRNALoc" for predicting localization of miRNAs. The server is freely accessible at http://cabgrid.res.in:8080/mirnaloc/.
  - Developed a database "FMDISC", which is an information system on Foot and Mouth disease of cattle. The database is freely available at http://bioinformatics.iasri.res.in/fmdisc/team.php
  - Lama, A, Singh, KN and Gurung, B. (2020). BayesARIMAX: Bayesian Estimation of ARIMAX Model (https://CRAN.R-project.org/package=BayesARIMAX)

PUBLICATIONS

Research Papers Published

1. Ahmadi, NM, Das, TK, Nasrat, N, Rathore SS and Paul AK (2020). Effect of phosphorus on yield and economics of maize (Zea mays) under semi-arid conditions of Afghanistan. *Indian Journal of Agricultural Sciences*, **90 (2)**: 439–41.
2. Anjoy, P, Chandra, H and Parsad, R (2020). Estimation and Spatial Mapping of Incidence of Indebtedness in the State of Karnataka in India by Combining Survey and Census Data. *Statistics and Applications*, **18(1)** (New Series), 21–33. http:// krishi.icar.gov.in/ jspui/handle /123456789/36705
3. Anuja, AR, Kumar, A,Saroj S and Singh, KN (2020). The impact of crop diversification towards high-value crops on economic welfare of agricultural households in eastern India. *Current Science*, **118(10)**: 1577-1582.doi: 10.18520/cs/v118/i10/1575-1582
4. Bahadri, S, Singh, YV, Baray, SM, Shivay, YS, Parsad, R and Sayedi, SA (2020). Effect of foliar application of nitrogen and varieties on productivity and profitability of mungbean (*Vigna radiata*) in Afganistan. *Indian Journal of Agricultural Sciences*, **90(3)**:72-75. http:// krishi.icar.gov.in/jspui/handle/123456789/37503.
5. Behera, SK, Shukla, AK, Suresh, K, Manorama, K, Mathur, RK, Kumar, A, Harinarayana, P, Prakash, C and Tripathi, A (2020). Oil palm cultivation enhances soil pH, electrical conductivity, concentrations of exchangeable calcium, magnesium and available sulphur and soil organic carbon content. *Land Degradation & Development*, https://doi.org/10.1002/ldr.3657.
6. Bishnoi, R, Singh, P, Satyapriya, Basak, P, Wason, M, Kumar, P, Sharma, DK and Dahiya, S. (2019). Assessment of Creative Potential of Students Pursuing Higher Education in Agriculture. *Indian Journal of Extension Education*, **55(4)**: 133-138.

7. Bishnoi, R., Singh, P, Satyapriya, Dahiya, S., Wason, M., Basak, P., Kumar, P. and Sharma, D. K. (2019). Development and Validation of e-module on Creativity for Agricultural Students. *Journal of Community Mobilization and Sustainable Development*, **14(3)**: 560-566.

8. Budhlakoti, N, Rai, A, & Mishra, DC (2020). Statistical Approach for improving Genomic prediction Accuracy through Efficient Diagnostic Measure of Influential Observation. *Scientific Reports*, **10(1)**: 1-11.

9. Das, B, Singh, P, Sangeetha, V, Bhowmik, A and Ray, P (2019). Constraints in the Consumption of Organic Foods in Eastern India. *Indian Journal of Extension Education*, **55(3)**: 102-106.

10. Jin, J, Wahlang, B, Shi, H, Hardesty, JE, Falkner, KC, Head, KZ, Srivastava, S, Merchant, ML, Rai, SN, Cave, MC and Prough, RA (2020). Dioxin-like and non-dioxin-like PCBs differentially regulate the hepatic proteome and modify diet-induced nonalcoholic fatty liver disease severity, *Medicinal Chemistry Research*, **29**, 1247–1263. https:// doi.org/10.1007 /s00044-020-02581-w

11. Kumar, D, Kumar, A, Chhokar, V, Gangwar, OP, Bhardwaj, SC, Sivasamy, M, Prasad, SSV, Sheoran, S, Singh, R, Sharma, P, Iquebal, MA, Jaiswal, S, Angadi, UB, Singh, G, Rai, A, Singh, GP, Kumar, D, and Tiwari, R (2020). Genome-wide association studies in diverse spring wheat panel for Stripe, Stem and Leaf rust resistance. *Frontiers in Plant Science*, **11**, 748, https://doi.org/10.3389/fpls.2020.00748.

12. Maity, PP, Chakrabarti, B, Purakayastha, TJ, Bhatia, A, Saha, ND, Singh, R, Sharma, A, Bhowmik, A, Kumar, V and Chakraborty, D (2020). Do elevated CO_2 and temperature affect organic nitrogen fractions and enzyme activities in soil under rice crop? *Soil Research*. **58(4)**: 400-410.

13. Mallik, A, Bhushan, S, Chakraborty, P, Jaiswar, AK and Ramasubramanian, V (2020). Stock structure analysis of *Priacanthus hamrur* (Forsskal, 1775) along the Indian coast based on truss morphometry, *Journal of Marine Biological Association of India*, **62(1)**: 21-24. doi:10.6024/ jmbai.2020.62.1.2109-0x

14. Nandi, L, Saha, P, Behera, T, Lyngdoh, YA, Munshi, A, Saha, N, Hossain, F, Bhowmik, A, Pan, RS, Verma, A and Tomar, BS (2020). Genetic characterisation and population structure analysis of indigenous and exotic eggplant (*Solanum* spp) accessions using microsatellite markers. *Journal of Horticultural Science & Biotechnology*. DOI: 10.1080/14620316.2020.1763211.

15. Parihar, CM, Singh, AK, Jat, SL, Dey, A, Nayak, HS, Mandal, BN, Saharawat, YS, Jat, ML and Yadav, OP (2020). Soil quality and carbon sequestration under conservation agriculture with balanced nutrition in intensive cereal-based system. *Soil and Tillage Research*, **202:** 104653.

16. Purushottama, GB, Ramasubramanian, V, Akhilesh, KV, Raje, SG, Thakurdas, Kizhakudan, SJ and Zacharia, PU (2020). Biological observations on the Bengal guitarfish *Rhinobatos annandalei* Norman, 1926 from the Eastern Arabian Sea, India, *Indian Journal of Fisheries*, **67(2):** 23-34.

17. Ramasubramanian V. (2020). Book Review on "Statistics for Agricultural Sciences by G. Nageswara Rao". *Journal of Indian Society of Agricultural Statistics*, **74 (1)**: 90-91.

18. Ramasubramanian, V., Iquebal, M. A., Ray, M., Sarika and Tomar, R.S. (2019). Introduction to Technology Forecasting and Assessment methods. *Bhartiya Krishi Anusandhan Patrika*, **34**: 124-129.

19. Sethi, S, Joshi, A, Arora, B, Bhowmik, A, Sharma, RR and Kumar, P (2020). Significance of FRAP, DPPH, and CUPRAC assays for antioxidant activity determination in apple fruit extracts. *European Food Research and Technology*. 246: 591–598.

20. Sharma, RR, Nagaraja, A, Goswami, AK, Thakre, M, Kumar, R and Varghese, E (2020). Influence of on-the-tree fruit bagging on biotic stresses and postharvest quality of rainy-season crop of 'Allahabad Safeda' guava (*Psidium guajava* L.). *Crop Protection*, **135**: 105216.

21. Shukla, AK, Behera, SK, Singh, VK, Prakash, C, Sachan, AK, Dhaliwal, SS, Srivastava, PC, Pachauri, SP, Tripathi, A, Pathak, J, Nayak, AK, Kumar, A, Tripathi, R, Dwivedi, BS, Datta, SP, Meena, MC, Das, S and Trivedi, V (2020). Pre-monsoon spatial distribution of available micronutrients and sulphur in surface soils and their management zones in Indian Indo-Gangetic Plain. *Plos one, 15*(6), p.e0234053.

22. Sidharthan, VK, Sevanthi, Amitha Mithra V, Jaiswal, S and Baranwal, VK (2020). Robust virome profiling and whole genome reconstruction of viruses and viroids enabled by use of available mRNA and sRNA- seq datasets in grapevine (*Vitis vinifera* L.). *Frontiers in Microbiology*, **11**, 1232, https://doi.org/10.3389/fmicb.2020.01232.

23. Singh, B, Das, A, Parihar, AK, Bhagwati, B, Singh, D, Pathak, KN, Dwivedi, K, Niranjan, D, Keshari, N, Midha, RL, Kumar, R, Pratap, A, Kumar, V, and Gupta, S (2020). Delineation of Genotype-by- Environment interactions for identification and validation of resistant genotypes in mungbean to root-knot nematode (*Meloidogyne incognita*) using GGE biplot. *Scientific Reports* (Nature research),**10**:4108. (https://doi.org/10.1038/s41598-020-60820-x).

24. Singh, DP, Singh, V, Shukla, R, Sahu, P, Prabha, R, Gupta, A, Sarma, BK, Gupta, VK. (2020). Stage-dependent concomitant microbial fortification improves soil nutrient status, plant growth, antioxidative defense system and gene expression in rice. *Microbiological Research*. 239:126538. DOI: 10.1016/j.micres.2020.126538

25. Singh, SHH, Das, A, Dey, S, Narsimaiah, L, Pandit, P, Sinha, K, Sahu, PK and Mishra, P (2020). A study on academic attainment of agriculture students and its correlations: a dummy regression approach. *Annals of Data Science*, https://doi.org/10.1007/s40745-020-00275-z

26. Upadhyay, D, Budhlakoti, N, Singh, A.K., Bansal, R., Kumari, J., Chaudhary, N., Padaria, J.C., Sareen, S., Kumar, S.(2020). Drought tolerance in *Triticum aestivum* L. genotypes associated with enhanced antioxidative protection and declined lipid peroxidation. *3 Biotech***10**: 281. https://doi.org/10.1007/s13205-020-02264-8.

Popular Articles:

- Rathod, S, Saha, A and Sinha, K (2020). Particle swarm optimization and its use in agricultural research. *Food and Scientific Reports*, **1(4)**: 37-41.
- Rathod, S, Saha, A and Sinha, K (2020). Introduction to survival analysis and application in agricultural research. *Food and Scientific Reports*, **1(4)**: 28-30.

Reference Manual /Manual/ E-manual/Pamphlet:

- Seema Jaggi, Rajender Parsad, Sukanta Dash and Arpan Bhowmik (2020). *Teaching Manual for course on Statistics: Experimental Designs and Analysis* for M.Sc. Students of Afghanistan National Agricultural Sciences and Technology University (ANASTU), Kandahar.

Book Chapter published:

- Varghese, C (2020). Eight files consisting of lesson content, PPT, question answers, objectives, glossary, assignment, etc. of one chapter "Lattice designs" was prepared and uploaded in E-learning content development for NAHEP subproject "Investments in ICAR Leadership in Agricultural Higher Education"
- Varghese, C (2020). Lesson contents of two chapters "BIB Designs" and "PBIB designs" were prepared and uploaded.

Publication in compendium/Proceedings:

- Anu Sharma and Aarti Singh (2020). An Overview and Comparison of Tools for Development of Recommendation Systems in National Conference on Advances in Electrical, Electronics & Computer Engineering. NCAEECE held on 5th June, 2020 online, Pp. 86-88.

LECTURES DELIVERED

1. Delivered lectures online entitled "Introduction to R & R programming" on 12, May 2020 in a training namely, "Online Faculty Development Programme on Data Science" organized by Department of Computer Science and Applications, Dr. Harisingh Gour University, Sagar, M.P. during 09-13 May, 2020. (Ramasubramanian V.)
2. Delivered three online lectures through MS-Team i) Planning of Experiments and Basic Experimental Designs, ii) Factorial Experiments, iii) Analysis of Experimental Data using SPSS, invited by Amity University, Noida in the Faculty Development Programme on "Experimental Designs, Research Methodology and Data Analysis in Agriculture Sciences" during June 25-26, 2020 organized by the Amity Food and Agriculture Foundation, Amity Institute of Horticulture Studies and Research & Amity Institute of Organic Agriculture. (Seema Jaggi)
3. Delivered an online lecture titled "Linear programming" on 12 June, 2020, in the Webinar series on "Quantitative Methods for Social Sciences" held during 01- 23 June, 2020 by ICAR-NIAP, New Delhi. (Harish Kumar H. V.)
4. Delivered one lecture on "Time series models (Linear, nonlinear and hybrid)" on 10 June, 2020 in Webinar series "Quantitative Methods for Social Sciences" organized during 01- 23 June, 2020 by ICAR-NIAP, New Delhi. (R.K. Paul)
5. Delivered invited lectures on two topics that are "Classification and regression by using Random Forest" and "Cluster analysis" in a Webinar on "Machine Learning & Artificial Intelligence in Data

Science (MAD 2020)", conducted by Department of Computer Science and Engineering, Jaypee Institute of Information Technology, Noida, during 08-12 June, 2020. (P.K. Meher)

CONFERENCES/WORKSHOPS/SEMINARS/SYMPOSIA/MEETINS ETC. ORGANIZED

- Anil Rai
  - Organized VC Meeting on ICT in Agricultural Extension on 05 May, 2020 under the Chairmanship of DDG (Ag.Ext).
  - Organized VC Meeting on Impact of COVID on Agriculture on 06 May, 2020 under the Chairmanship of Secretary DARE and DG ICAR, New Delhi.
  - Organized VC Meeting on Ecosystem Agricultural Research on 07 May, 2020 under the Chairmanship of Secretary DARE and DG ICAR, New Delhi.
  - Organized VC meeting on ICAR schemes on 23May, 2020 under the Chairmanship of Secretary DARE and DG ICAR, New Delhi.
  - Organized meeting of Regional Committee-I of ICAR on June 30 under the Chairmanship of Honourable Union Agriculture Minister, Sh. N.S. Tomar.
  - Organized meeting of Governing Body of ICAR on June 29, 2020 under the Chairmanship of Secretary DARE and DG ICAR, New Delhi.
  - Organized VC Meeting on ICT in Horticulture on June 02, 2020 under the Chairmanship of DDG (Hort).

- Organized a one-day online Workshop in association with HRM Unit, ICAR on "Training Management Information System (TMIS) for HRD Nodal Officers of ICAR" at IASRI New Delhi on 08 May, 2020. (Sudeep and Shashi Dahiya)
- Organized Webinar series on "Be+ during Covid-19" during 22-27 June, 2020. (Anshu Bharadwaj, Alka Arora and Soumen Pal).

PAPERS PRESENTED

Papers presented /Invited talks delivered in Conferences

- Anu Sharma presented a paper entitled "An Overview and Comparison of Tools for Development of Recommendation Systems" in the online Virtual Conference organized on 05 June, 2020 by Institute for Technology and Research (ITRESEARCH).
- Anil Rai gave a presentation on "Computer Intensive Statistical Techniques for Agricultural Research and Development" for newly elected NAAS Fellows 2020on 25June, 2020.
- Rajender Parsad presented Agricultural Knowledge Resources and Information Systems Hub for Innovations: Current Status and Way forward in Online Experts Meet on ICAR-Geoportal Spatial Data Infrastructure and Applications-Way forward on 02 June 2020 organized by partner centre ICAR-NBSS&LUP, Nagpur.
- Kanchan Sinha presented a paper titled "Grey System Theory Based Model Improved by Markov Chain: An Innovative Approach to Forecast Yearly Rice Production of Jharkhand" in a national

level web based seminar on "Recent Trends in Statistical Theory and Application" organized by Department of Statistics, University of Kerala during 29 June - 01 July, 2020.

- Hukum Chandra gave presentation on "Data Collection: Review, Measurement Scales and Questionnaires Development" in Online National Workshop on Research Methodology: Concepts & Applications at Maharana Pratap University of Agriculture and Technology, Udaipur during 26-27 June, 2020.

PARTICIPATION
International Conference/ Workshop/Symposium etc.

- Anu Sharma attended International Symposium on FAB 2020: Symposium on Foundations and Applications of Blockchain on 01 May, 2020.

Conference/ Workshop/ Seminar/ Symposia/Training/Foundation Course/ Annual Day/ Lectures etc.

- Anil Rai participated as Panelist in Webinar on ICT Tools for the Resilient Agriculture Education in India on 23 May, 2020.
- Anshu Bharadwaj
  - attended the SAS Global Forum's Executive Connection organized by SAS Inc on 19 May, 2020.
  - attended the Webinar on "ICT Tools for the Resilient Agriculture Education in India" organized by NAHEP on 21 May, 2020.
- Anu Sharma attended in Webinar Series "Be Positive" during 22nd to 27th June 2020, under the aegis of NAHEP, Component-II at ICAR-IASRI.
- Hukum Chandra
  - attended (Webinar) Panel Discussion on "Covid-19: Impacts and New Normal in Agriculture" organized by National Academy of Agricultural Sciences, New Delhi on 05 June, 2020. Session was chaired by Dr T. Mohapatra, Secretary, DARE and DG ICAR.
  - attended IASS Webinar: "Sample Surveys on Covid-19 Pandemia Around The World" on 24 June, 2020.
  - attended the National Workshop on "Research Methodology: Concepts & Applications" at Maharana Pratap University of Agriculture and Technology, Udaipur during 26-27 June, 2020 (Online).
  - attended webinar on "Scope of Farm Mechanization in India", Hosted by Mm Activ Sci-Tech Communications Pvt Ltd, New Delhi on 30 June, 2020.

- Kanchan Sinha
    - participated in a national level web-based seminar on "Recent Trends in Statistical Theory and Application" organized by department of Statistics, University of Kerala during 29th June to 01st July, 2020.
    - participated in Be + webinar during 22nd to 27th June 2020, under the aegis of NAHEP organized by ICAR-IASRI.
    - participated in the International Webinar on Application on Data Science and Applied Statistics organized by Society of Education and Council of Research and Sustainable Development on 21 May, 2020.
- Md. Samir Farooqi
    - attended online National Workshop on Research Methodology: Concepts & Applications during 26-27 June, 2020 organized by MPUAT, Udaipur.
    - attended Webinar Series on "Be+ during Covid-19" during 22nd to 27th June 2020, under the aegis of NAHEP organized by ICAR-IASRI.
- Mohd. Harun attended a Webinar series on "Be+ during Covid-19" during June, 22-27, 2020 organized jointly by PIU, NAHEP and Division of Computer Applications, ICAR-IASRI, New Delhi.
- Mukesh Kumar participated in two days online FFP Annual Review Workshop during 17-18 June, 2020.
- Pal Singh attended Webinars on ICT tools for resilient agricultural education in India on 21 May, 2020.
- Rajeev Ranjan Kumar Participated in Be + webinar organized by ICAR-IASRI.
- Rajender Parsad
    - attended online Experts Meet on ICAR-Geoportal Spatial Data Infrastructure and Applications -Way forward on June 2, 2020 organized by partner centre ICAR-NBSS&LUP, Nagpur.
    - attended Webinar Panel Discussion on "Covid-19: Impacts and New Normal in Agriculture" organized by NAAS on June 5, 2020 (5:30 p.m. Indian time and 8:00 a.m. Washington DC, USA time) as part of Foundation Day of NAAS.
    - participated in Webinar on ICT Tools for the Resilient Agriculture Education in India on 21May, 2020.
    - participated in Webinar on Science, Society and Exponential Change: Reimagining the Future on 20 May, 2020.
- S.B. Lal
    - attended a two-days online National Workshop on Research Methodology: Concepts & Applications sponsored by IDP-NAHEP and organized by Directorate of Students Welfare, Maharana Pratap University of Agriculture and Technology, Udaipur, Rajasthan during 26-27 June, 2020.
    - attended a Webinar Series on "Be+ during Covid-19" during 22nd to 27th June 2020, under the aegis of NAHEP. These Webinars were delivered using Microsoft Teams communication and collaboration tool.
- Samarth Godara participated in the following online courses authorized by deeplearning.ai, and offered through Coursera:

- Convolutional Neural Networks on 09 June, 2020.
- Improving Deep Neural Networks Hyperparameter tuning, Regularization and Optimization on 10 June, 2020.
- Sequence Models on 16 June, 2020.
- Structuring Machine Learning Projects on 19 June, 2020.
- Neural Networks and Deep Learning certificate on 22 June, 2020.

- Seema Jaggi
  - attended the online meeting of the NAAS Journal Score Committee (NJSC) for revisiting the guidelines/proforma for evaluation of non-IF journals on June 30, 2020 through ZOOM video conferencing.
  - attended the webinars of presentations by newly elected Fellows in the Scientific Sessions of the Annual Programme of National Academy of Agricultural Sciences (NAAS) during June 22 - 25, 2020.
  - participated in a Webinar on Sexual Harassment at Workplace: Challenges during Lockdown on 01 May, 2020 organized by Centre for Social Research (CSR), New Delhi.
  - participated in a Webinar Series on Be+ during Covid-19 during June 22-27, 2020 organized by IASRI under NAHEP through MS-Team.
  - participated in an online Training Workshop on Training Management Information System (TMIS) and HRM Issues conducted for HRD Nodal Officers of ICAR jointly by ICAR-IASRI and HRM Unit ICAR on 08 May, 2020.

- Seema Jaggi, Rajender Parsad, Cini Varghese, B N Mandal, Sukanta Dash, Sunil Kumar Yadav, Mohd. Harun, Ankur Biswas and Raju Kumar participated in an online training on e-office organized by the Division of Computer Applications, ICAR-IASRI, New Delhi on 22 May, 2020.

- Shivaswamy G P delivered an online lecture on the topic "Logit, Probit and Tobit models" on 3rd June in the webinar series on "Quantitative Methods for Social Sciences" organized by ICAR-NIAP from 1st June to 23rd June 2020.

- Soumen Pal participated in online Webinar on "e-Education in Agricultural Sciences in the age of Social Distancing: Opportunities, Challenges and Strategies" organized by Assam Agricultural University under NAHEP on 05 June, 2020.

- Vandita Kumari participated in Webinar Series on Be+ during COVID 19, organized during 22-27 June, 2020.

CONSULTANCY/ADVISORY SERVICES PROVIDED:

- Achal Lama analyzed data on different soil parameters using PCA and Cluster analysis for Dr. Shaon Kumar Das, Scientist, ICAR Research Complex for NEH Region, Sikkim.

- Arpan Bhowmik
  - provided advisory services to Dr. Sagar D, Scientist from Division of Agricultural Entomology, ICAR-IARI, New Delhi on the use of two way factorial ANOVA for studying the effect of six Chickpea Genotype and two treatments (control and infested) on different biochemical characters relating to damage by *Helicoverpa armigera*.

- provided advisory services to Dr. Debjyoti Sen Gupta, Scientist, ICAR-IIPR, Kanpur on the use of Repeated Measure ANOVA for ODAP analysis of different accessions and plant parts at mature stage of *Lathyrus sativus.*
- provided advisory services to Mr. Deepak Kumar Koli, Ph.D. Scholar from Division of Microbiology, ICAR-IARI, New Delhi on the use of Principal component analysis and cluster analysis to study the effect of Spirulina addition or chemical composition on antioxidant activity (in terms of DPPH percent inhibtion and FRAP) variation.
- provided advisory services to Dr. Aditi Kundu, Scientist, Division of Agricultural Chemicals, ICAR-IARI, New Delhi on the use of Box-Behken design involving three factors Matrix to Solvent Ratio, Time and Frequency to obtain maximum value of different parameters (extraction yield, phenolic content etc.) with respect to Extraction of Pogostemon leaves in ultrasonicator.
- advised Mr. Pramod K. Sahu, Scientist, ICAR-NBAIM, Mau for calculation of Power of the test for experiments involved Endophytic bacilli from medicinal-aromatic perennial Holy basil (*Ocimum tenuiflorum* L.) to study its impact on whether it modulates plant growth promotion and induced systemic resistance against Rhizoctonia solani in rice (Oryza sativa L.).
- advised Mr. Sreenatha.A, Ph.D. scholar from Division of Food Science and Post-harvest Technology, ICAR-IARI, New Delhi on the use of D-optimal Mixture Experiments for developing Fingermillet based ready to eat extrudate (RTE) with low Glycemic Index.
- Kanchan Sinha
  - analyzed tea price data of northern and southern zone, India using threshold cointegration model for Mr. Soumik Dey, Ph.D. student, Bidhan Chandra Krishi Viswavidyalaya, West Bengal.
  - carried out "Principal component analysis and Cluster analysis" on the data obtained from different temperature and biomass type on different physico-chemical properties of biochar as provided to Dr. Shaon Kumar Das, Scientist (Sr. Scale), ICAR Research Complex for NEH region, Sikkim Centre for his research work.
- M A Iquebal advised Dr Swarna Laxmi, Principal Scientist, ICAR-IARI, New Delhi regarding metagenomics data analysis.
- Mohd. Harun
  - advised a Ph.D. student Mr. Anil Patidar from Division of Plant Genetic Resources, ICAR-IARI, New Delhi for regarding the analysis of data collected via an experiment involving wheat crop. The experiment involved the two basic types of wheat i.e. Normal Sowing and Late Sowing Cultivars.The design of experiment used was augmented block design with 5 blocks of unequal sizes. There were in total 92 test accessions and 4 controls.
  - provided advisory services to a Ph.D. student Mr. Pawan Kumar Malav from Divison of plant genetic resources, ICAR-IARI, New Delhi regarding analysis of data collected on 12 number of parameters (Moisture content, TSS, Protein content, Ash content, Starch content, Cu, Fe, Zn etc.) via an experiment conducted involving 11 varieties of Melon.
  - Prabina Meher provided advisory service to Dr. Shailendra Sharma, Professor, Department of Genetics and Plant Breeding, Ch. Charan Singh University, Meerut, Uttar Pradesh on Genome-wide association analysis for 9 agronomic traits and 6 grain morphology traits of wheat crop.

- Sarika advised Dr. Partha Saha, Scientist, ICAR-IARI, New Delhi regarding molecular marker data analysis.
- Vandita Kumari
  - advised Ms. Aparna Veluru, Scientist, ICAR-CPCRI, Kasaragod, Kerala on the analysis of data related to study conducted using 10 characterized rose genotypes under two types of coconut plantations.
  - provided advisory to Dr Kumari Rajani, Assistant Professor cum Junior Scientist, Department of Seed Science and Technology, BAU, Sabour on the analysis of data related to experiment conducted to study the effect of chitosan and chitosan nanoparticles on biochemicals under salinity and drought stress in lentil seed.
  - provided advisory to Shashi Bhusan Kumar, M.Sc. (Ag.), Department of Seed Science and Technology, Bihar Agricultural University, Sabour on the procedure to analyze the data pertaining to experiment conducted to identify the suitable packaging material for minimizing the loss in seed quality during storage.

SOFTWARE DEVELOPED

Statistical and Geographic Information System/ Data bases/mobile apps developed*Technology Assessed /Transferred*

Technology Assessed /Transferred

- Division of Computer Application
  - Implementation of MIS/FMS in all ICAR institutes
  - HYPM
  - KRISHI
  - FFP
  - KVK Portal
  - Education Portal
  - Animal Reproduction App (in colloboration with ICAR-IVRI, Bareilly)
  - Pig Farming App (in colloboration with ICAR-IVRI, Bareilly)

स्वच्छ भारत

एक कदम स्वच्छता की ओर

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agri-search with a human touch