



# ICAR-IASRI



## NEWS

Volume 24

No. 1

April-June, 2019

- Research Activities
- Awards and Recognition
- Human Resource Development
- Panorama of Activities
- Publications
- Lectures Delivered
- Participation
- Consultancy/Advisory Services
- Personnel

### *From director's desk.....*

An R package "VIRF" for Computation of volatility impulse response function for multivariate time series model has been developed and published in CRAN and is available at <https://cran.r-project.org/package=VIRF>. In order to investigate the spill-over effect of price of a particular agricultural commodity from one market to another market, volatility impulse response function (VIRF) is used under the framework of Multivariate GARCH model. The complexity of the model and non-availability of suitable software package restricts the researcher from its application. The current developed package will encourage the researcher to go for application of VIRF for investigating spill-over effect and draw valid conclusions.



Methodology for obtaining calibration estimators of finite population mean and ratio has been developed under Adaptive Cluster Sampling design using Calibration Approach. The expressions of approximate variance and the estimate of variance of the proposed calibration estimators have also been proposed. A simulation study was carried out in order to study the statistical performance of the proposed calibration estimators with respect to usual Horvitz Thompson estimator under adaptive cluster sampling design using a real dataset. The proposed calibration estimators of the population mean as well as ratio under adaptive cluster sampling design were found to be performing better than the Horvitz-Thompson estimator with respect to percent Relative Root Mean Square Error (% RRMSE). Developed Calibration methodology will be useful for estimation of finite population parameters using available auxiliary information situations when the members bearing a characteristic of interest are sparsely scattered in a geographically distributed population.

Three training programmes were conducted on a range of topics.. I am also glad to announce that a good number of publications has come out during this period. The institute received nine copy rights on various achievements.

Scientists of the Institute have provided Consultancy/Advisory services and participated in different Conference/Symposia/Workshop etc. in various capacities and also delivered invited lectures. It is hoped that the contents of the document would be informative and useful. Any suggestion for improving the contents of the newsletter further would be highly appreciated.

(Lal Mohan Bhar)

## RECOGNITIONS

1. Rajender Parsad acted as panelist for a Panel discussion on Ethics in Scientific Research and Publications organized to mark Foundation day celebrations of Indian Society of Seed Technology on April 23, 2019 at Virology Auditorium, ICAR-IARI, New Delhi.
2. Anil Rai acted as member of DPC at ICAR-Research Complex for Eastern Region, Patna for the promotion of scientists.
3. B N Mandal acted as reviewer of one research article in the Behaviour Research Methods journal published by Springer.
4. Hukum Chandra acted as Member Secretary, Quinquennial Review Team (QRT) of ICAR-IASRI, New Delhi for the Period 2011-2018.
5. Hukum Chandra acted as Associate Editor, reviewed paper on Journal of Statistical Theory and Practice.
6. Hukum Chandra acted as Member, Sectional Committee on "Statistical Methods for Quality and Reliability" (MSD3), Bureau of Indian Standards, New Delhi.
7. Hukum Chandra acted as Member, Subcommittee for "Sampling Methods" (MSD 3:6), Bureau of Indian Standards, New Delhi.
8. Hukum Chandra acted as Member, Committee to resolve various issues related to Bt. Cotton/HT Cotton, Ministry of Agriculture and Farmers Welfare, Govt. of India.
9. Hukum Chandra acted as Expert Member, Core Group on Normalization, National Testing Agency, Gautam Budh Nagar, Ministry of Human Resource Development, Govt. of India.
10. Hukum Chandra acted as Expert Member, Giri Institute of Development Studies (GIDS), Lucknow, Uttar Pradesh.
11. Hukum Chandra acted as Member Secretary, Quinquennial Review Team (QRT) of ICAR-IASRI, New Delhi for the Period 2011-2018.
12. K.K. Chaturvedi received Reviewer Certificate (21st May 2019) from Journal of Software: Practice and Experience for reviewing manuscripts in 2018.
13. B. N. Mandal acted as a reviewer of one research article in the Statistics and Applications journal published by Society of Statistics and Computer Applications.
14. M. A. Iquebal working as Co-Chairperson of ONE Ph.D. (Bioinformatics) Student, Mr. Rahul Singh Jasrotia (PID: 15PHBIN104) registered at Sam Higginbottom Institute of Agriculture, Technology and Sciences (Formerly Allahabad Agriculture Institute) (Deemed-to-be-University), Allahabad, India.
15. Anil Rai acted as chairman of the committee for conducting examination of the recruitment of administrative personals in ICAR.
16. Anil Rai acted as Member of Counselling Steering Committee for admission of UG/PG/Ph.D. students in different agricultural universities,

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

1. Anu Sharma delivered a C seminar on newly proposed project entitled “Machine Learning Approaches for Binning of Metagenomics Data”.new project entitled “Machine Learning Approaches for Binning of Metagenomics Data”.
2. Tauqueer Ahmad formulated a new project proposal entitled “Integrated Sampling Methodology for Crop Yield Estimation at Gram Panchayat Level using Advanced Technologies for Crop Insurance” as PI and submitted to MNCFC, New Delhi on 31.05.2019 against call for Expression of Interest by Credit Division, Department of Agriculture, Cooperation and Farmers Welfare (DACFW), Ministry of Agriculture and Farmers Welfare (MoAFW), Govt. of India through MNCFC.

## HUMAN RESOURCE DEVELOPMENT

### Training programs organized:

S.N.	TITLE	VENUE	PERIOD	NUMBER OF PARTICIPANTS
1.	<b>HPC Administration</b> Course Director K.K. Chaturvedi	ICAR-IASRI, New Delhi	29 April, 2019	--
2.	<b>HPC Administration</b> Storage Course Director K.K. Chaturvedi	ICAR-IASRI, New Delhi	8th May 2019	--
3.	<b>Data Analysis and Interpretation</b> Course Director Hukum Chandra	ICAR- IASRI, New Delhi	13-24 May, 2019	--

## PUBLICATIONS

### Research Papers

1. Harish Kumar, H V Communicated abstract on paper titled "Credit to Agriculture by Scheduled Commercial Banks (SCBs) in India-A Micro Level Overview" authored Harish Kumar H.V, Shivaswamy G.P, Anuja A.R, Achal Lama,K.N. Singh and Rajesh T for eighth International Conference on Agricultural Statistics 2019 (ICAS-VIII), to be held during 18-21 November 2019 at New Delhi, India.

2. Parsad, R (2019). Construction of nested partially balanced incomplete block designs. *Statistics and Applications*, 17(1): 275-280. <http://krishi.icar.gov.in/jspui/handle/123456789/19784>.
3. Choudhary, K, Jha, GK, Kumar, RR and Mishra, DC (2019). Agricultural commodity price analysis using ensemble empirical mode decomposition: A case study of daily potato price series. *Indian Journal of Agricultural Sciences*. 89(5):882-6.
4. Sah, U, Kumar, N, Saxena, H, Dubey, SK, Iquebal, MA, Bhat, S and Singh, SK (2019). Validation of farmer to farmer extension model for dissemination of quality seeds of pulse crops: experiences from Bundelkhand Region of Uttar Pradesh. *Indian Journal of Extension Education*, 54(2): 176-182.
5. Jasrotia, RS, Yadav, PK, Iquebal, MAs, Bhatt, SB, Arora, V, Angadi, UB, Tomar, RS, Jaiswal, S, Rai, A and Kumar, D (2019). VigSatDB: Genome wide microsatellite DNA marker database of three species of Vigna for germplasm characterization and improvement. *Database: The Journal of Biological Databases and Curation*. (<https://academic.oup.com/database/article/doi/10.1093/database/baz055/5506750>)
6. Chandra, H, Gupta, S and Shreyaskar, PKP (2019). Disparity in Rural Poverty in Indo-Gangetic Plain in India: A Disaggregate Level Analysis. *Statistics and Application, The special A.K. Nigam felicitation issue, The Society of Statistics, Computer and Application*. 17(1), page 181–194.
7. Gupta, VK and Chandra, H (2019). *Statistics and Application*. Edited (Special issue Special Issue to felicitate Professor Arun Nigam on his 75th birthday). Society of Statistics, Computer and Applications New Delhi, Volume 17(1). ISSN 2454-7395. Total pages 269 and 19 papers.
8. Farooqi Mohammad Samir, Mishra DC, Chaturvedi KK, Rai Anil, Lal SB, Kumar Sanjeev, Bhati Jyotika and Sharma Anu. (2019) A Review on Recent Statistical Models for RNA-Seq Data. *Journal of Applied Bioinformatics & Computational Biology*. 8:1 DOI: 10.4172/2329-9533.1000162.
9. Jasrotia, Rahul Singh, Yadav, Pramod Kumar, Iquebal, Mir Asif, Bhatt, S.B., Arora, Vasu, Angadi, U.B., Tomar Rukam Singh, Jaiswal, Sarika, Rai, Anil, Kumar, Dinesh (2019). VigSatDB: Genome wide microsatellite DNA marker database of three species of Vigna for germplasm characterization and improvement. *Database: The Journal of Biological Databases and Curation*. (<https://academic.oup.com/database/article/doi/10.1093/database/baz055/5506750>). Shya msundar Parui, B.N. Mandal, Rajender Parsad and Sukanta Dash (2018). Orthogonal Latin hypercube designs for three columns. *Utilitas Mathematica*, 108, 149-158. <http://krishi.icar.gov.in/jspui/handle/123456789/20956>

10. Rajeev Kumar, B.N. Mandal and Rajender Parsad (2019). Construction of Balanced Sampling Plans Excluding Adjacent Units. *Journal of the Indian Society of Agricultural Statistics*, 73(1), 27-32. <http://krishi.icar.gov.in/jspui/handle/123456789/20964>
11. Verma, R., Wason, M., Padaria, R.N., Singh, P., Sarkar, S. and Bhowmik, A. Adoption of Information and Communication Technology among Rural Women in Uttar Pradesh: A Study of Barriers. *Journal of Community Mobilization and Sustainable Development*. 13(3), 578-582,
12. Shruti, Sharma, J. P., Burman, R. R., Gills, R. and Bhowmik, A. (2018). Developing Value Chain Map for Maize in Samastipur district Bihar- Methodological Approach. *Journal of Community Mobilization and Sustainable Development*. 13(3), 606-612.
13. Maity, P.P., Chakrabarti, B., Bhatia, A., Purakayastha, T.J., Saha, N.D., Jatav, R.S., Sharma, A., Bhowmik, A., Kumar V. and Chakraborty, D. (2019). Effect of Elevated CO<sub>2</sub> and Temperature on Growth of Rice Crop. *International Journal of Current Microbiology and Applied Sciences*. 8(1), 1906-1911.
14. Kumar, S., Sangeetha, V., Singh, P., Burman, R.R., Bhowmik, A. (2018) Stakeholders' Perception about Rice Knowledge Management Portal's information. *Indian Journal of Extension Education*. 5 (3), 79-84.
15. Gautam, A., Kumar, R. and Jain, S. (2019). Prevalence of gingival inflammation among pregnant women attending the Anugrah Narayan Magadh Medical College and Hospital, Gaya Bihar India. *International Journal of Medical and Health Research*, 5(6), 47-49.
16. Das, A., Gupta, S., Parihar, A.K., Saxena, D., Singh, D., Singha, K.D., Kushwaha. K.P.S., Chand, R, Bal, R.S. and Chandra S. Deciphering genotype-by-environment interaction for targeting test environments and rust resistant genotypes in field pea (*Pisum sativum* L.). doi: 10.3389/fpls.2019.00825.
17. Chowdhary, D., Bharadwaj, A. , Sehgal, V.K., Kumar, M., Sudeep, Biswas, A., Parsad, R. and Verma, R. (2019) Development of Mega-Environment for Maize in India using GIS approach. *Journal of the Indian Society of Agricultural Statistics*, 73(1), 79–86

### Popular Article

- L.M. Bhar, Ramasubramanian, V., Alka Arora, Sudeep Marwah and Rajender Parsad (2019). Era of Artificial Intelligence: Prospects for Indian Agriculture. *Indian Farming*, 69(03):10-13.
- L.M. Bhar, S.K. Ambast, S.K. Soam and Ch. Srinivasa Rao (2019). Status and Prospects of Artificial Intelligence in Agriculture. *Proceedings and Recommendations of National Workshop on Artificial Intelligence in Agriculture held during July 30-31, 2018 at NASC Complex, New Delhi*. pp1-92. (Eds.: Rajender Parsad, Sudeep Marwah, V. Ramasubramanian, Alka Arora, M. Balakrishnan, V.V. Sumanth Kumar, G.R.K. Murthy, S. Mohanty and D.K. Panda) <http://krishi.icar.gov.in/jspui/handle/123456789/19206>.

- Mukesh Kumar, Anshu Bharadwaj, Soumen Pal, Rajni Jain, Shiv Kumar, Chetna Gupta, Rama, V. P. Chahal (2019). FFP Portal: A tool for knowledge dissemination of Farmer FIRST Programme, Indian Farming, Vol. 69, No 5
- Ramasubramanian V., Shekhawat, R.S. and Singh, S. P. (2019). (Hindi article) Forecasting based on Markov chain model, Bhartiya Krishi Anusandhan Patrika, 34, 17-22.
- चायना जाना, शशि दहिया, वी.के. महाजन, टी.के. दास, एन.एम. आलम एवं ऊषा जैन(2018.19) "भारत में क्षेत्रीय फसलों के लिए हर्बीसाइड्स संस्तुति पर एक वेब आधारित प्रणाली"
- शशि भूषण लाल, अनु शर्मा, कृष्ण कुमार चतुर्वेदी, मोहम्मद समीर फारूकी, द्विजेश चन्द्र मिश्र, संजीव कुमार और अनिल राय (2018 -19). इंटरनेट ऑफ थिंग्स (आई. ओ. टी. ) और कृषि : एक अवलोकन । सांख्यिकी विमर्श (14) :33 - 39.
- अनु शर्मा, शशि भूषण लाल, कृष्ण कुमार चतुर्वेदी, मोहम्मद समीर फारूकी, द्विजेश चन्द्र मिश्र, नीरज बुधलाकोटी, संजीव कुमार और अनिल राय (2018 -19 ). मेटागेनोमिक्स डेटा के विश्लेषण और एनोटेशन के लिए सॉफ्टवेयर उपकरण। सांख्यिकी विमर्श (14 ):76 -79.
- मुरारी कुमार, मोहम्मद समीर फारूकी, कृष्ण कुमार चतुर्वेदी, शशि भूषण लाल, द्विजेश चन्द्र मिश्र, अनु शर्मा, चन्दन कुमार देब, पंकज दास, अनिमेष कुमार, और अमित कैरी (2018 -19 ). ग्रन्थ सूची के त्वरित निष्कर्षण एवं उसके बिब्लिओमेट्रिक विश्लेषण हेतु वेब स्क्रेपिंग टूल का विकास । सांख्यिकी विमर्श (14 ):61 - 64.
- नरेन्द्र सिंह तोमर, सुब्रत गोरेन, अनिल कुमार, सुकान्त दाश, प्रवीण आर्य एवं धर्मराजसिंह. (2018-19) महाराष्ट्र में ड्रिप सिंचाई प्रौद्योगिकी के विकास का एक अध्ययन, भारतीय कृषि सांख्यिकी अनुसंधान संस्थान की हिन्दी पत्रिका, सांख्यिकी-विमर्श, (14):13.16.

### **Reference Manual /Manual/ E-manual/Pamphlet**

Paul, S, Singh, P. and Marwaha, S. (2019) Advances in Data Science using R. CAFT Training Brochure (bilingual).

### **Book Chapter**

- Misra, T., Haque, M. A., Pal, S., Ray, M., Mukherjee, A., Roy, H. S., Kairi, A. and Kumar, P.(2019). E-learning Module-Tools and Techniques. ICT and Social Media for Skill Development in Agriculture.

### **Lecture Delivered**

#### **Out side**

1. Shruti, Sharma, JP, Burman, RR, Gills, R, Singh, M and Bhowmik, A (2018). Clustering of Various Agricultural Processors for Identifying Training Need to Promote Value Chain Development. Indian Journal of Extension Education. 54 (1), 143-148.

2. Krishna, DK., Kumbhare, NV, Padaria, RN, Singh, P and Bhowmik, A (2018). Extent of Participation of Respondents in Production and Broadcasting Programme of Community Radio. *Indian Journal of Extension Education*. 54 (2): 148-152.
3. Budhlakoti, N, Mishra, DC, Rai, A, Lal, SB, Chaturvedi, KK and Kumar, RR (2019). A Comparative Study of Single Trait and Multi-Trait Genomic Selection. *Journal of Computational Biology*. Vol 26, pg 1-13.
4. Sheoran, S, Jaiswal, S, Kumar, D, Raghav, N, Sharma, R, Pawar, S, Paul, S, Iquebal, MA, Jaiswar, A, Sharma, P, Singh, R, Singh, CB, Gupta, A, Kumar, N, Angadi, UB, Rai, A, Singh, GP, Kumar, D and Tiwari, R (2018). Uncovering genomic regions associated with 36 agro-morphological traits in Indian spring wheat using GWAS. *Frontiers in Plant Science*.
5. Gautam, P, Ananthan, PS, Ramasubramanian, V, Sharma, A and Jha, BC (2018). An assessment of fisheries and management in Rihand reservoir, Uttar Pradesh, *Current Agriculture Research Journal*, 6(3): 1-12.
6. Bhar, LM, Ramasubramanian, V, Arora, A, Marwaha, S and Parsad, R (2019). Era of Artificial Intelligence: Prospects for Indian agriculture, *Indian Farming*, 69(03): 10-13.
7. Bhar, LM, Ramasubramanian, V, Arora, A, Parsad, R and Marwaha, S (2019). Artificial Intelligence in Agriculture: Status and Prospects in India, *Proceedings and Recommendations of the National Workshop on Artificial Intelligence in Agriculture held during July 30-31, 2018 at NASC Complex, New Delhi*, <https://naarm.org.in/wp-content/uploads/2019/04/Artificial%20Intelligence%20in%20Agriculture.pdf>, pages 8-18.
8. Bhar, LM, Ambast, SK, Soam, SK and Rao, CS (2019). Status and Prospects of Artificial Intelligence in Agriculture, *Proceedings and Recommendations of the National Workshop on Artificial Intelligence in Agriculture held, New Delhi*, pp: 1-92; <https://naarm.org.in/wp-content/uploads/2019/04/Artificial%20Intelligence%20in%20Agriculture.pdf>.
9. Paul, R, Arya, P and Kumar, S (2019). Use of Artificial Intelligence in Statistical Research. *Indian Farming (Special Issue on Artificial Intelligence in Agriculture)*. 69(3): 28-31.
10. Yogi, V, Kumar, P, Kar, A, Singh, R, Singh, R, Arya, P and Awasthi, OP (2019). Risk Management Strategies in Kinnow Value Chain in North-Western India. *Indian Journal of Extension Education*, 55(1):124-128.
11. Saxena, R., Singh, NP, Paul, R.K. and Kumar, R. (2019). Market linkages for the major onion markets in India. *Indian Journal of Horticulture* 76 (1), 133-140
12. Sarkar, S, Paul, RK, Paul, AK and Bhar, LM (2019). Wavelet based Multi-scale Auto-Regressive (MAR) Model: An Application for Prediction of Coconut Price in Kerala. *Journal of The Indian Society of Agricultural Statistics* 73 (1): 1-10.
13. Paul, RK, Arya, P and Kumar, S (2019). Use of Artificial Intelligence in Statistical Research. *Indian Farming* 69 (3):28-31

14. Meher, PK, Sahu, TK, Gahoi, S, Satpathy, S and Rao, AR (2019). Evaluating the performance of sequence encoding schemes and machine learning methods for splice sites recognition. *Gene*.

## **CONFERENCES/ WORKSHOPS/ SYMPOSIA/ MEETINGS ETC. ORGANIZED**

1. D.C. Mishra conducted a workshop cum training named "Next Generation Sequencing Data Analysis" held at Indian Veterinary Research Institute (IVRI), Bareilly during 24-25, April, 2019.

## **PAPERS PRESENTED**

### *Paper presented / Invited talk delivered in Conferences*

1. Rajender Parsad presented paper in Technical Workshop on Framework for AICRP Information System in ICAR-BMGF collaborative project on Application of Next Generation Breeding, Genotyping, and Digitalization Approaches for Improving the Genetic gain in Indian Staple Crops organized by ICAR-IARI, New Delhi during April 24-25, 2019.
2. Shashi Dahiya delivered Invited talk lectures on "Designing Databases and Online Applications with Case Studies" on 3<sup>rd</sup> of April, 2019 in the "FACULTY DEVELOPMENT PROGRAMME ON DATA ANALYTICS" in Lady Irwin College, University of Delhi, New Delhi held during 3<sup>rd</sup> -5<sup>th</sup> April, 2019.
3. Soumen pal delivered Invited talk lectures on 'Data Analytics with Case Studies through R' in Faculty Development Programme on Data Analytics in Lady Irwin College, University of Delhi on 5<sup>th</sup> April, 2019.
4. Anil Rai delivered a invited lecture on "Advanced Supercomputing Hub for OMICS Knowledge in Agriculture and Genomic Selection for accelerated agricultural production" in a Workshop entitled " NGS data analysis" organized under CAAST-NAHEP on April 24-25, 2019 at ICAR-IVRI, Bareilly, U.P.
5. D.C. Mishra delivered two lectures with hands on the topic "Next Generation Sequencing Platform and Preprocessing of NGS Data" and "Genome Assembly: Concept and Challenges" in the training cum workshop entitled " Next Generation Sequence Data Analysis" held at IVRI, Bareilly, U.P. during 24-25, April, 2019.
6. K.K. Chaturvedi delivered two lectures "Linux for Bioinformaticians" and "Sequence Alignment" as resource person in NGS data analysis workshop cum Training sponsored by CAAST-NAHEP at ICAR-IVRI, Bareilly during 24-25 April 2019.
7. Sanjeev Kumar conducted theory and practical sessions on Sequence analysis and Genome annotation in the "Workshop-cum-training on NGS data analysis" at Assam Agricultural University, Jorhat during 14-16 March 2019.
8. Ramasubramanian V. presented paper on Social hierarchy and human development: A case study of reservoir fishers in Karnataka, India, in conference named 12th Asian Fisheries and Aquaculture Forum held at Iloilo, Philippines during 8-12 April 2019.
9. K.K. Chaturvedi presented an invited talk "Maintaining and Managing Supercomputing Resources in Agriculture" in Altair's Annual Altair Technology Conference (ATC): High



Performance Computing (HPC) Track held at Le Meridian Windsor Place, New Delhi on 14th June 2019.

10. Rajender Parsad paper presented on “Designing, analysis and data management in AICRP Trials Invied Talk)” in X Annual Group Meeting of All India Network Research Project on Onion & Garlic held at ICAR-IARI, New Delhi during May 31-June 01, 2019.

## **PARTICIPATION**

*Conference /Workshop/ Seminar/ Symposia/ Training/ FoundationCourse/ Annual Day/ Lectures etc.*

1. Rajender Parsad participated the Workshop for Chief Data Officers of OGD Platform India organized by National Informatics Centre at India Habitat Centre on April 11, 2019. Also shared OGD experiences and experiences gained for implementing KRISHI Portal.
2. Rajender Parsad participated technical workshop of ICAR-BMGF collaborative project on Application of Next Generation Breeding, Genotyping, and Digitalization Approaches for Improving the Genetic gain in Indian Staple Crops organized by ICAR-IARI, New Delhi during April 24-25, 2019.
3. Susheel Kumar Sarkar attended a two days technical workshop of the project was held on April 24-25, 2019 at NASC and IARI. Breeding programmes of various crops and AICRPs were discussed at length
4. Anshu Bharadwaj attended Workshop for Chief Data Officers of Open Government Data Platform NIC at India Habitat on 11<sup>th</sup> April 2019.
5. Hukum Chandra participated in workshop on "Social Transfers to Revitalize Rural India" and Launch of IFPRI Global Food Policy Report 2019 at NAAS Lecture Hall, NASC Complex, Pusa, New Delhi on April 26, 2019.
6. SN Islam attended 52<sup>nd</sup> Annual Maize at AAU, Jorhat during 5-7 April, 2019.
7. Tauqueer Ahmad and Hukum Chandra participated in the workshop on "SDG Indicators Related to Food and Agriculture" organized by Ministry of Statistics and Prgramme Implementation, Govt. of India and FAO of the United Nations at New Delhi during 06-10 May, 2019.
8. Mukesh Kumar and Shashi Dahiya attended a workshop on Digital Technology in Agriculture at Education Division, KAB-II, ICAR on 3<sup>rd</sup> May, 2019.
9. Anil Rai attended National Symposium on “Exploring Potential for sustainable use of Indigenous Animal Genetic Resources for Enhancing Productivity and Profitability” organized by Indian Society of Animal Genetics and Breeding (ISAGB) and delivered Lead Lecture “Animal Bioinformatics” at Sher-e- Kashmir University, Jammu from May 30-31, 2019.
10. Rajender Parsad participated National Workshop on Sustainability of Indian Agriculture: Methodology and Indicators organized by ICAR-NIAP, New Delhi during 18-19 June, 2019 at ICAR-NIAP, New Delhi

11. Rajender Parsad participated Brainstorming session on Enhancing Science Culture in Agricultural Research Institutions organized by National Academy of Agricultural Sciences on June 25, 2019 at NASC Complex, New Delhi
12. Seema Jaggi, attended the Foundation Day and Annual General Body Meeting of National Academy of Agricultural Sciences (NAAS) at NASC Complex during June 4-5, 2019.
13. S.B.Lal participated in Management and Functioning of HPC meeting on 10th June, 12th June, 15th June and 25th June 2019
14. S.B.Lal participated in Operational management and maintenance of HPC resources on 21st May 2019.
15. S.B.Lal participated in Altair's annual Altair Technology Conference (ATC) on 14th June 2019 at Le Meridian Windsor Place, New Delhi.
16. K.K. Chaturvedi participated in Management and Functioning of HPC meeting on 10th June, 12th June, 15th June and 25th June 2019.
17. K.K. Chaturvedi participated in Operational management and maintenance of HPC resources on 21st May 2019.
18. U.B. Angadi attended the Altair ATCx 2019 Conference at New Delhi on 14/6/2019.
19. U.B. Angadi attended the Statistics Day on 29/6/2019 at Vigyan Bhawan, New Delhi
20. Md. Samir Farooqi attended the National Statistics Day workshop on 29.06.2019 (Saturday) at Plenary Hall, Vigyan Bhawan, Maulana Azad Road, New Delhi.

### **Consultancy/ Advisory Services Provided**

#### **Rajender Parsad**

1. Advised to Ms. Ayushi Srivastava, Research Scholar, Department of Genetics and Plant Breeding, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi on the analysis of data generated from an line x tester experiment (9 lines and 3 testers). The advisory was provided along with Sukanta Dash.
2. Provided advisory services to Sabina Islam, Senior Scientist, Division of Vegetable Science, ICAR-IARI, New Delh on the use of Fisher's Protected LSD for Multiple Comparisons in the analysis of data pertaining to a trial conducted to evaluate 26 germplasms of garlic in RCB design with 3 replications.

#### **U.B. Angadi**

1. Provided consultancy service for a project with International Livestock Research Institute (ILRI) is in progress and total consultancy fee is Rs.3,96,750/- for 23 man-days
2. New consultancy service proposal "Development database and analysis tool for feed demand-supply assessment in Mali, West Africa" has been prepared with ILRI South Asia Region, New Delhi and submitted the same for approval. Total consultancy fee is Rs.4,42,500/- for 25 man-days.

#### **Mir Asif Iquebal**

1. Advised Prachi Shripatrao Yadav, Scientist, IARI, New Delhi regarding experimental designing for whole genome data generation.
2. Provided advisory services to Ram Asrey, Principal Scientist, IARI, New Delhi regarding analysis of data.
3. Advised to Prachi Shripatrao Yadav, Scientist, IARI, New Delhi regarding experimental designing for whole genome data generation.

### **Sarika**

1. Provided advisory services to Chiranjit Kaur, Principal Scientist, IARI, New Delhi regarding response surface design analysis. Advised Chiranjit Kaur, Principal Scientist, IARI, New Delhi regarding response surface design analysis.
2. Pdivised to Chiranjit Kaur, Principal Scientist, IARI, New Delhi regarding response surface design analysis.

### **B. N. Mandal**

1. Advisory services provided to Harisankar Sinha, Scientist, National Research Centre on Equines, Hisar on computation of seroprevalence of Glanders disease in equines. Tests of hypothesis of equality of seroprevalence across states, years and zones were suggested. Odds ratio computation methodology was also described.
2. Advisory services provided to Hari Shankar Singha from NRC Equines, Hisar to analyze glanders seroprevalence data in horse and for testing for equality of seroprevalence across states, months and for computation of odds ratio.
3. Advisory services provided for cluster analysis and principal component analysis on 25 genotypes based on 17 characters to Sh. Desh Raj, M.Sc. student from CSKHPKV, Palampur.
4. Advisory services provided to Sh. Mohan, M.Sc. student of ICAR-Indian Agricultural Research Institute, New Delhi to perform analysis of variance and comparison of treatment means for two experiments conducted using completely randomized design for wheat and soybean crops, respectively.
5. Advisory services provided to Shri Madan Kumar, Scientist, ICAR-Indian Institute of Agricultural Biotechnology (IIAB), Ranchi for performing Duncan's Multiple Range Test for more than 150 genotypes.

### **Arpan Bhowmik**

1. Advisory services provided to Nivedita Jain, Principal Scientist, IARI on the use of principal component analysis to study the variations among different treatments using environmental and soil parameters. Further, similarity analysis was also carried out between treatments using hierarchical clustering techniques.
2. Advisory services provided to Ms. Sneha, a M.Sc. student from division of Microbiology, IARI on the use of combined analysis for different chemical and biological soil parameters and also for plant parameters where the experiments were laid out in 9 different locations.

For each locations, test vs. control contrast were also analyzed. Correlation analysis were carried out between chemical and biological soil parameters and also between chemical soil parameters and plant parameters. Further, principal component analysis were also carried out to study the variations in the data over the locations. Further, PAM clustering was also carried out to study the similarity of different locations in terms of microbial content based on the different characters.

### **Wasi Alam**

1. provided advisory service to Mr. Deepak Kumar, M.Sc. (Ag.), Department of Plant Breeding and Genetics, BAU, Sabour, Bhagalpur, Bihar.

### **Ravindra Singh Shekhawat**

1. provided consultancy service to Kapilla Shekhawat, Senior Scientist, Division of Agronomy, IARI, analyzed weed intensity data of different cropping system by using PCA.
2. Provided consultancy service to Anshu Ahlawat, Associate Professor of Junagadh Agricultural University, Gujarat to application of ANN in the lactation of milk.

### **Amrit Paul**

1. Guided NBPGR Scientist Sharwan Singh to study the classification of Germplasm of carrot.
2. Guided M. F.sc. student Mr. Phibi Philip Naduvathu of ICAR-CIFE, Mumbai and gave one month exposure training on 'Use of SAS Software for Genetic Data Analysis' at ICAR-IASRI.

## **SOFTWARE DEVELOPED**

### *Statistical and Geographic Information System/ Data bases/mobile apps developed*

#### **U.B. Angadi**

1. Updation of various tables of all the sections were done in the databook. All the data was updated from various sources. The final updated material was sent to press and proof reading was done. Necessary corrections were made in the material in the press.
2. Maps depicting area and production of food crops like wheat, jowar, bajra, maize, total pulses, oilseeds etc were designed in GIS environment. Maps were also designed depicting area and production of fruit crops like Mango, Banana, sweet orange, Apple, Papaya, vegetables like Potato, Onion, Tomato, area and production of flowers, production of livestock products like meat, wool, milk, egg.

### *Technology Assessed /Transferred*

1. FFP
2. KVK Portal
3. Education Portal
4. Animal Reproduction App
5. Pig Farming App

6. R package “WaveletANN” for modelling by combining wavelet and ANN method is developed and published in CRAN. <https://cran.r-project.org/package=WaveletANN>
7. R package “VIRF” for Computation of volatility impulse response function for multivariate time series model using algorithm by Jin, Lin and Tamvakis (2012) is developed and published in CRAN. <https://cran.r-project.org/package=VIRF>

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एक कदम स्वच्छता की ओर



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

*Agrisearch with a human touch*

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