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

From Director's desk……………

This Newsletter highlights salientfeatures on training programs conducted, workshops organized and other significant activities performed at the Institute during the period under report.

A universal tool, *PolyMorphPredict* for polymorphic microsatellite marker discovery from whole genome and transcriptome data was developed which is freely available and can be accessed at http://webtom.cabgrid.res.in/polypred/. This tool can accelerate the *in silico* microsatellite polymorphism discovery in re-sequencing projects of any species of plant and animal for their diversity estimation along with variety/ breed identification, population structure, MAS, QTL and gene discovery, traceability, parentage testing, fungal diagnostics and genome finishing.

Quantitative proteomic analysis reveald novel stress-associated active proteins (SAAPs) and pathways involved in modulating tolerance of wheat under terminal heat. 3600 proteins to be upregulated and 5825 proteins to be downregulated in both the wheat cultivars under heat stress have been identified. The identified SAAPs can be used for targeted protein-based precision wheat-breeding program for the development of 'climate-smart' wheat.

Suitable sampling methodologies for estimation of quantitative harvest and post-harvest losses of Capture fisheries (Marine and Inland) and Culture fisheries (Inland and Marine) have been developed which will provide reliable estimates of quantitative harvest and post-harvest losses of fish at different stages/ channels of supply chain i.e. from production to consumption at maritime zone/ province/ State level and national level. Separate sampling design, sample size and estimation procedure have been proposed for "on-site" and "off-site" assessment of losses. It is expected that this methodology will be adopted by the developing countries in near future with FAO support for estimation of post-harvest losses of fish. The developed methodology will be helpful for FAO in achieving Sustainable Development Goals (SDG) 12.3 which seeks to halve food waste at the retail and consumer levels and decreasing post-harvest losses as an internationally agreed methodology is not yet developed and data are largely unavailable.

Two Mobile Apps viz. "IVRI-Vaccination Guide" and "IVRI- Pig Ration" App have been designed and developed in collaboration with ICAR-IVRI, Izatnagar. Six training programmes were

organized at the Institute in this quarter. During the period under report, the Institute has received one copyright on

Resources Server. One scientist visited Tanzania to attend workshop on Small Area Estimation Techniques and its Applications held at Eastern Africa Statistical Training Centre, Dar Es. Salaam, Tanzania during 03-07 December, 2018 and Myanmar, to attend Expert Meeting on Improvement of Crop Statistics under Global Strategy to improve Agricultural and Rural Statistics organized by FAO of United Nations in Myanmar during 17-21 December, 2018.

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)

HONOURS/ AWARDS

- Ramasubramanian, V. got Dr. Anamitra Saha Prize Award for the paper published: Qureshi, N.W., Krishnan, M., Wani, S.A., Ramasubramanian, V., Sivaramane, N. and Sundaramoorthy, C. (2017) Negative Externalities in Kashmir Lake Fisheries: Transformation in Species Patronage, Use Priorities and Policy, Indian Journal of Agricultural Economics, 72(1), 89-101; Awarded by Indian Journal of Agricultural Economics, Mumbai; Paper adjudged as Best among the papers published in the Journal during the year 2017.

- Dr. Cini Varghese, Dr. Seema Jaggi and Dr. Rajender Parsad paper received the Best Paper Award 2014-15 among the papers in the field of Design of Experiments published in Journal of the Indian Society of Agricultural Statistics during the 72nd Annual Conference of the Indian Society of Agricultural Statistics held at ICAR-Central Institute of Agricultural Engineering, Nabi Bagh, Bhopal, MP from 13-15 December, 2018:

- Dr. Sukanta Dash honored with Bharat Vikas Award in the occasion of National Seminar on Intellectuals Social Responsibility on 1st December 2018 at Bhubaneswar, Odisha for loyalty, diligence and outstanding performance in the field of Artificial neural Network and Multivariate Statistics.

- Dr. Samarendra Das, Dr. A.K. Paul, Sh. S.D.Wahi and Dr. Rohan Kumar Raman are awarded the Prize for their paper entitled A Comparative Study of Various Classification Techniques in Multivariate Skew-Normal Data Published in the Journal of the Indian Society of Agricultural Statistics, Volume 69, No.3, December, 2015. Paper has been adjudged the best among the papers in the field of Statistical Theory and Methodology and published in the Journal during the years 2014-2015. This was awarded by ICAR-CIAE, Bhopal on 13 Dec., 2018.

- Dr. A.K.Paul, Dr. Ranjit Kumar Paul, Dr. VT.Prabhakaran, Sh. Inder Singh and Dr. A Dhandapani are awarded the Prize for their paper entitled Performance of parametric and Non Parametric Stability Measures published in the Journal of the Indian Society of Agricultural Statistics, Volume 69,No3, December 2015. Paper has been adjudged the best among the papers in the field of Statistical Genetics and Genomics and published in the Journal during the years 2014-2015. This was awarded by ICAR-CIAE, Bhopal dated the Dec. 13,2018

- Dr. Bishal Gurung, Dr. Prajneshu and Dr. Himadri Ghosh are awarded the Prize for their paper entitled Stochastic Volatility Model Fitting using Particle Filter: An Application Published in the Journal of the Indian Society of Agricultural Statistics, Volume 68, No.3, December 2014. Paper has been adjudged the best among the papers in the field of Applied Statistics and published in the Journal during the years 2014-2015. This was awarded by ICAR-CIAE, Bhopal dated the Dec. 13, 2018.

- Rajesh T. got the best paper award for contributory paper entitled "Impact of RKVY Expenditure on State Plan Agricultural Expenditure: A Co-integration Analysis" at 72nd Annual conference of Indian Society of Agricultural Statistics held at ICAR-CIAE, Bhopal during 13th -15th of December 2018.

RECOGNITIONS

1. Hukum Chandra acted as Resource Person in the training programme on "Survey Research Methodology for Researchers and Faculty" during 08-10 October, 2018 at ICMR-NIMS, New Delhi.

2. Hukum Chandra acted as Expert Member, Advisory Committee on "Assessment of Zero Budget Natural Farming in Andhra Pradesh", Centre for Economic and Social Studies, Hyderabad and Govt of Andhra Pradesh, 2018. Committee constituted by Govt of Andhra Pradesh.

3. Hukum Chandra acted as the Chairman of selection committee conducted interview of one Office Assistant on 17 October, 2018 at ICAR-IASRI, New Delhi.

4. Tauqueer Ahmad acted as Chairman, Selection Committee by the Director of the Institute for conducting Walk-in interview for the post of one RA/SRF and one YP-II under Crop Insurance project held on 24 October 2018 at ICAR-IASRI, New Delhi.

5. Prachi Misra Sahoo was nominated as Member, Selection Committee by the Director of the Institute for conducting Walk-in interview for the post of one RA/SRF and one YP-II under Crop Insurance project held on 24 October 2018 at ICAR-IASRI, New Delhi.

6. Anil Rai visited "Central Statistical Office (CSO), Lusaka Zambia" under FAO Rome project for imparting training to enumerators and officials involved in field testing of guidelines on estimation of losses of meat and milk, preparation of questionnaire for field data collection, pre-testing of the questionnaire, from 23-29 September, 2018.

7. Hukum Chandra acted as Expert Member, Madras Institute of Development Studies and Department of Economics and Statistics, Govt. of Tamil Nadu, Chennai.

8. Hukum Chandra acted as Expert Member, Departmental Promotion Committee (DPC) constituted by ASRB for the assessments of the Scientists in the discipline of Agricultural Statistics at ICAR-CIFRI, Barrackpore, West Bengal on 15 November, 2018.

9. Rajender Parsad acted as External Expert for carrying out the Academic Audit for the session 2017-18 of the Department of Statistics, M.D. University, Rohtak. Meeting was held on 20 November, 2018.

10. Anil Rai Chaired a session on "Bioinformatics and data mining" in 72nd Annual Conference of Indian Society of Agricultural Statistics held during December 13-15, 2018.

11. Rajender Parsad acted as Member, Executive Council, National Academy of Agricultural Sciences till December 2019.

12. Susheel Kumar Sarkar acted as Rapporteur in Invited paper session of Design of Experiments in 72nd annual conference of Indian Society of Agricultural Statistics at ICAR-CIAE, Bhopal during 13-15December, 2018

13. Susheel Kumar Sarkar acted as Chairman in student's paper session in 72nd annual conference of Indian Society of Agricultural Statistics at ICAR-CIAE, Bhopal during 13-15 December, 2018

14. Anindita Datta acted as Rapporteur in the contributory paper session 'Sample Surveys and Applications' chaired by Dr. Padam Singh in the 72nd Annual Conference of the Indian Society of Agricultural Statistics organized at ICAR-Central Institute of Agricultural Engineering, Nabi Bagh, Bhopal, MP during 13-15 December, 2018.

15. Arpan Bhowmik acted as an External Expert of a three members assessment committee for upgradation of Ms. Shruti Khus, Ph.D. Scholar, Department of Agricultural Extension, ICAR-IARI from JRF to SRF under BSR Scheme.

16. Arpan Bhowmik Rapporteur for Technical Session V on Unit Level Data in the Third National Workshop of Officer Incharge, Data Management (ICAR Research Data Repository for Knowledge Management) KRISHI during 4-5 December, 2018 organized by KRISHI project team at NASC and ICAR-IASRI, New Delhi.

17. Sukanta Dash acted as a Rapporteur for Technical Session III on Unit Level Data in the Third National Workshop of Officer In-charge, Data Management (ICAR Research Data Repository for Knowledge Management) KRISHI during 4-5 December, 2018 organized by KRISHI project team at NASC and ICAR-IASRI, New Delhi.

18. A.K.Paul was convener of the invited session"Statistical Genetics&Genomics"in 72nd national conference of Indian Society of Agricultural Statistics during 13-15 December, 2018 at ICAR-CIAE, Bhopal .

19. A.K.Paul acted as chairman of the contributed Paper session"Statistical Genetics"in 72nd national conference of Indian Society of Agricultural Statistics during 13-15 December, 2018 at ICAR-CIAE, Bhopal.

20. K.K. Chaturvedi member, Technical Program Committee, 9th International Conference on Quality, Reliability, Infocom Technology and Business Operations (ICQRITBO'2018) during 27-29 Dec., 2018 at Conference Centre, University of Delhi.

21. K.K. Chaturvedi chaired the committee meeting for Technical Specification and Bid Evaluation committee for procurement of RHEL on 11-12 Dec. 2018.

22. A. R. Rao acted as a Convener for the session on "Statistical Genetics and Genomics" organized under 72nd Annual conference of Indian Society of Agricultural Statistics (ISAS) on "Statistics, Informatics, Engineering Interventions and Business opportunities: A Road-Map to Transform Indian Agriculture Towards Prosperity" during 13-15 December, 2018.

23. K. N. Singh acted as convenor of the session "Statistical modelling and forecasting" in 72nd Annual Conference of ISAS, Bhopal, MP held on 13-15 December, 2018.

24. Tauqueer Ahmad was appointed as an External Examiner by Kashmir University, Srinagar for conducted Survey project viva-voce of M.Sc. final year students of Kashmir University, Srinagar, Jammu & Kashmir during 21-24 December, 2018.

25. Tauqueer Ahmad worked as Chairman and Convener of the session of Geo-statistics and Remote Sensing during 72nd ISAS conference at ICAR-CIAE, Bhopal during 13-14 December, 2018.

26. Tauqueer Ahmad acted as as member, Technical Advisory Committee (TAC) for participating in meeting for Crop Insurance to be held on 27 December, 2018 at Krishi Bhawan, New Delhi.

27. Hukum Chandra received Fellow of Indian Society of Agricultural Statistics (FISAS), 2018 onwards.

28. Hukum Chandra was Resource Person in the workshop on "Small Area Estimation Techniques and its Applications" held at Eastern Africa Statistical Training Centre, Dar Es. Salaam, Tanzania, during 03-07 December, 2018.

29. Hukum Chandra was Convener in the invited technical session on "Recent Advances in Analysis of Complex Survey Data", in the 72nd Annual Conference of Indian Society of Agricultural Statistics at Bhopal, Madhya Pradesh during 13-15 December, 2018.

30. Hukum Chandra was Expert Member in the Expert Meeting on Improvement of Crop Statistics under Global Strategy to improve Agricultural and Rural Statistics organized by FAO of United Nations in Myanmar during 17-21 December, 2018.

31. Hukum Chandra was invited Speaker in the International Conference on Emerging Innovation in Statistics and Operation Research 2018 held at Rohtak (Haryana) during 27-30 December, 2018.

32. Hukum Chandra Chaired, one invited paper session on "Recent Advances in Analysis of Complex Survey Data", in the 72nd Annual Conference of Indian Society of Agricultural Statistics, Bhopal, Madhya Pradesh during 13-15 December, 2018.

VISITS ABROAD

1. Dr. Hukum Chandra visited Tanzania, to attend workshop on Small Area Estimation Techniques and its Applications held at Eastern Africa Statistical Training Centre, Dar Es. Salaam, Tanzania during 03-07 December, 2018 and visited Myanmar, to attend Expert Meeting on Improvement of Crop Statistics under Global Strategy to improve Agricultural and Rural Statistics organized by FAO of United Nations in Myanmar during 17-21 December, 2018.

NEW PROJECTS/ SCHEMES/ PROGRAMMES/ CENSUS/ SAMPLE SURVEYS/ EVALUATION STUDIES INITIATED AND COMPLETED

1. New Project proposal seminar was delivered by Md. Samir Farooqi on "Methodology for
2. Mohamad Sameer Farooqi, Prepared and submitted the RPP 1 of new project proposal on "Methodology for Trait Specific Genes Identification".

3. Ramasubramanian V. presented a new institute project proposal entitled "Enhanced Classification And Regression Tree (CART) models for forecasting in agriculture" on 10 Dec., 2018 in DRC meeting.
4. Harish Kumar H V presented new project proposal titled "Institutional credit to agriculture in India: Surplus or Scarce?" at DRC meeting held on 10.12.2018.

HUMAN RESOURCE DEVELOPMENT

Training programs organized

S.N.	TITLE	VENUE	PERIOD	NUMBER OF PARTICIPANTS
1.	**Handling Large Scale Data and Data Analysis using R** *Course Director* Dr. Hukum Chandra *Co-Course Director* Dr. Pradip Basak	**ICAR-IASRI, New Delhi**	**08.10.2018 to 13.10.2018**	--
2.	**Advanced Sampling Techniques with Practical Examples from NSSO & Health Surveys** *Course Director* Dr. Hukum Chandra *Co-Course Director* Deepak Singh	**ICAR-IASRI, New Delhi**	**29.10.2018 To 03.11. 2018**	--
3.	**Training programme on ICAR-ERP** *Course co ordinators* Dr. Anshu Bharadwaj Dr. Alka Arora	**ICAR-IASRI, New Delhi**	**08.10.2018 To 12.10.2018**	**23**
4.	**Recent Advances in Agricultural Bioinformatics: Big Data Analytics** *Course co ordinator* Dr. K.K. Chaturvedi *Co course co ordinator* Mohammad Samir Farooqi	**ICAR-IASRI, New Delhi**	**14.11.2018 to 04.12.2018**	--

5.	**Design of Experiments and Data Analysis** *Course co ordinators* Dr. Seema Jaggi Dr. Rajender Parsad Dr. Anindita Datta	**ICAR-IASRI, New Delhi**	**12 .11.2018 To 11.02.2019**	--
6.	**Advances in Experimental Designs and Analysis** *Course coordinator* Dr. BN Mandal *Co course coordinators* Dr. Sukanta Dash Dr. Anil Kumar	**ICAR-IASRI, New Delhi**	**06.12.2018 To 26.12.2018**	--

* *Information not available*

CONFERENCES/ WORKSHOPS/ SYMPOSIA/ MEETINGS ETC. ORGANIZED

1. KRISHI project team of ICAR-IASRI organized 3rd National Workshop of Officer In-charge Data Management for ICAR Research Data Repository for Knowledge Management Initiative at NASC and ICAR-IASRI, New Delhi during December 04-05, 2018.
2. Organized 72nd national conference of Indian Society of Agricultural Statistics during 13-15 December, 2018 at ICAR-CIAE, Bhopal (Dr.A.K.Paul as co organizing Secretary)
3. Organized the Workshop at KVK, Hazaribagh (Jharkhand) during 13-14 December, 2018.(Sh. S.N. Islam)
4. Organized a group meeting for 25 KVKs at ATARI, Kanpur during 17 December, 2018.(Sh. S.N. Islam)

PUBLICATIONS

Research Papers

1. Krishna, G, Sahoo, RN, Singh, P, Bajpai, V, Patra, H, Kumar, S, Dandapani, R, Gupta, VK, Viswanathan, C, Ahmad, T and Sahoo, PM (2019). Comparison of various modelling approaches for water deficit stress monitoring in rice crop through hyperspectral remote sensing, Agricultural Water Management, 213, 231-244. Available at https://doi.org/10.1016/j.agwat.2018.08.029
2. Chakraborty, D, Sehgal, VK, Dhakar, R, Varghese, E, Das, DK and Ray, M (2018). Changes in daily maximum temperature extremes across India over 1951-2014 and their relation with cereal crop productivity. Stochastic Environmental Research and Risk Assessment. 32 (11): 3067-81. https://link.springer.com/article/10.1007/s00477-018-1604-3
3. Shekhawat, RS, Singh, KN, Kumar, A, Sarkar, KP, Doni, R and Gurung, B (2018). Stochastic volatility in mean model for capturing the conditional variance in volatile time series data, Indian Journal of Agricultural Sciences, 88(10): 1644-1647.

4. Kumar, S, Shiva Dhar, Yadav, R.S., Chandrakala, M., Kochewad, S.A., Meena, L.R., Meena, L.K., Magan Singh and Arpan Bhowmik. (2018). Effect of Integrated K Management on Productivity and Nutrient Use Efficiency of Maize-Wheat Cropping System. Int. J. Curr. Microbiol. App. Sci. 7(08): 1052-1061.

5. Aarti Singh and Anu Sharma (2018). A clustering-based recommendation engine for restaurants. Int. J. Advanced Intelligence Paradigms, Vol. 11, Nos. 3/4

6. Karangwa J, Bharadwaj, A, Arora, A, Chandra, H and Aditya, K (2018) " Web based Software for Small Area Estimation under Unit Level Model" published in e-Proceedings Research Frontiers in Precision Agriculture, ISBN: 978-93-88237-13-0; Published by Excel India Publishers, New Delhi of International Conference of Asia Pacific Federation for Information Technology in Agriculture (AFITA) and World Congress on Computers in Agriculture (WCCA) on Research Frontiers in Precision Agriculture heldat IIT Mumbai during October 24-26, 2018; Pp: 325-32

7. Jain, R, Bharadwaj, A, Pavithra, S and Paul, RK(2018) "Perception of Students on ICT in Agricultural Education" published in e-Proceedings Research Frontiers in Precision Agriculture, ISBN: 978-93-88237-13-0; Published by Excel India Publishers, New Delhi of International Conference of Asia Pacific Federation for Information Technology in Agriculture (AFITA) and World Congress on Computers in Agriculture (WCCA) on Research Frontiers in Precision Agriculture heldat IIT Mumbai during October 24-26, 2018; Pp: 329-331

8. Dahiya, S, Das, S and Bharadwaj, A (2018) "Online Classification usingC4.5 Algorithm"published in e-Proceedings Research Frontiers in Precision Agriculture, ISBN: 978-93-88237-13-0; Published by Excel India Publishers, New Delhi of International Conference of Asia Pacific Federation for Information Technology in Agriculture (AFITA) and World Congress on Computers in Agriculture (WCCA) on Research Frontiers in Precision Agriculture held at IIT Mumbai during October 24-26, 2018; Pp: 338-339

9. Islam, SN and Mishra, R(2018) "Expert System Shell for Developing Multi Crop Expert Systems" published in e-Proceedings Research Frontiers in Precision Agriculture, ISBN: 978-93-88237-13-0; Published by Excel India Publishers, New Delhi of International Conference of Asia Pacific Federation for Information Technology in Agriculture (AFITA) and World Congress on Computers in Agriculture (WCCA) on Research Frontiers in Precision Agriculture held at IIT Mumbai during October 24-26, 2018; Pp: 314-316

10. Shekhawat, RS, Singh, KN, Lama, A and Gurung, B (2018). Price Discovery and Co-integration Analysis between Spot and Futures Prices of Refined Soy Oil in India, Int. J. Curr. Microbiol. App. Sci, 7(11): 40-46.

11. Kumar, RR, Singh, K, Ahuja, S, Tasleem, M, Singh, I, Kumar, S, Grover, M, Mishra, D, Rai, GK, Goswami, S, Singh GP, Chinnusamy, V, Rai, A and Praveen, S (2018). Quantitative proteomic analysis reveals novel stress-associated active proteins (SAAPs) and pathways involved in modulating tolerance of wheat under terminal heat. Functional & Integrative Genomics, pp 1–20.https://doi.org/10.1007/s10142-018-0648-2

12. Biswas, A, Rai, A and Ahmad, T (2018). Rescaling Bootstrap Technique for Variance Estimation for Ranked Set Samples in Finite Population. Communications in Statistics - Simulation and Computation. DOI: 10.1080/03610918.2018.1527349.

13. Parihar, AK, Basandrai, AJ, Kushwaha, A.K, Chandra KPS, Singha, S, Bal, KD, Saxena, RS , Singh, D and Gupta, S (2018). Targeting test environments and rust-resistant genotypes in lentils (Lens culinaris) by using heritability-adjusted biplot analysis. Crop & Pasture Science, 69, 1113–1125.https://doi.org/10.1071/CP18259.

14. Sharma, SR, Parihar, AK, Singh, D, Varshney, N, Lal, C, Sharma, V and Khedar, OP (2018). Genetic components and traits relationship in a panel of Black gram [Vigna mungo (L.) Hepper] diverse genotypes. Journal of Food Legumes 31(1): 10-14.

15. Mandal, BN, Parsad, R & Dash, S (2018): Construction of Aoptimal balanced treatment incomplete block designs: An algorithmic approach, Communications in Statistics - Simulation and Computation, DOI: 10.1080/03610918.2018.1508701.

16. Krishna, DK, Kumbhare, NV, Padaria, RN, Singh, P and Bhowmik, A (2016). Content Analysis and Comparative Study of Good Management Practices Followed by Community Radio Stations. International Journal of Agriculture Sciences, 10(12): 6485-6488.

17. Jaggi, S, Pateria, DK, Varghese, C, Varghese, E and Bhowmik, A (2018). A note on circular neighbor balanced designs. Communications in Statistics – Simulation and Computation, 47(10): 2896-2905.

18. Saurav, S, Varghese, C, Varghese, E and Jaggi, S (2018). Designs for sensory trials involving foods of animal origin. The Pharma Innovation Journal, 7(11): 405-408.

19. Gupta, MC, Sharma, AK, Singh, AK, Roy, HS and Bhadauria, SS (2018). Assessment of genetic divergence in thirty-five genotypes of oilseed Brassica species.Journal of Pharmacognosy and Phytochemistry,7(6): 2076-2080.

20. Ahirwar, RN, Mishra, VK, Chand, R, Budhlakoti, N, Mishra, DC, Kumar, S, Singh, S, Joshi, AK (2018). Genome-wide association mapping of spot blotch resistance in wheat association mapping initiative (WAMI) panel of spring wheat (Triticum aestivum L.). PLOS ONE. pp 1–20. https://doi.org/10.1371/journal.pone.0208196.

21. Farooqi, MS and Kumar, D (2018). "On Dagum Distribution Based on Dual Generalized Order Statistics with Applications", Int. J. Agricult. Stat. Sci. Vol. 14, No. 2, pp. 833-841.

22. Sahu, TK, Pradhan, D, Rao, AR and Jena, L (2018). In silico site-directed mutagenesis of neutralizing monoclonal antibody 4C4 and analysis of its interaction with G-H loop of VP1 protein to explore its therapeutic applications against foot and mouth disease. Journal of Biomolecular Structure and Dynamics, DOI: 10.1080/07391102.2018.1494631

23. Alam, W, Ranjan, RK, Ray, M, Rathod, S and Singh, KN (2018). Improved ARIMAX model based on ann and svm: an application for forecasting rice yield using weather variables. Indian Journal of Agricultural Sciences. 88(12): 1909–13.

24. Rathod, S, Singh, KN, Gurung, B and Ray, M (2018). An improved space time autoregressive moving average model for Modeling and Forecasting spatio-temporal time series data. Journal of the Indian Society of Agricultural Statistics. 72 (3): 239-253.

25. Anokhe, A, Mandel, B, Kumar, R, Sharma, K, Ranjan, R and Subramanian, S (2018). Biochemical charecterisation of lipase in host specific Bemisia tabaci (Gennadius) (Hemiptera: Aleyrodidae) population collected from different agro ecological zone. Journal of Entomology and Zoology Studies, 6(6): 1304-1310.

26. Anjoy, P, Chandra, H and Basak, P (2018). Estimation of Disaggregate-Level Poverty Incidence in Odisha Under Area-Level Hierarchical Bayes Small Area Model. Social Indicators Research. DOI: 10.1007/s11205-018-2050-9.

Popular Articles

27. सुमीत सौरव, सिनी वर्गीस, मो. हारून, सीमा जग्गी एवं मो. हारून एवं देवेन्द्र कुमार (2018) संवेदी परीक्षणों में परीक्षण उत्पादों की दो नियंत्रण उपचार से तुलना हेतु संतुलित अभिकल्पनाएं । भारतीय कृषि अनुसंधान पत्रिका, 33(3): 218–220.

28. अखिलेद्या झा, सिनी वर्गीस, सीमा जग्गी, मो. हारून एवं देवेन्द्र कुमार (2018) तीन प्रतिकृतियों वाली असमान खण्ड आकारों में समाधेय आंद्यिक संतुलित अपूर्ण खण्ड (2) अभिकल्पनाओं की नई श्रृंखला । भारतीय कृषि अनुसंधान पत्रिका, 33(3): 161–164.

29. अर्पण भौमिक, सीमा जग्गी, एल्दो वर्गीस, सुनील कुमार यादव, मोहम्मद हारून, सिनी वर्गीस, अनिंदिता दत्ता एवं उदयवीर सिंह। विविधता के दो स्त्रेतों के अंतर्गत पद्यु परीक्षणों के लिए प्रवृत्ति मुक्त अभिकल्पनाएँ । भारतीय कृषि अनुसंधान पत्रिका । 33(3): 200–202 ।

30. Mandal, BN, Dash, S, Kumar, A and Kumar, D (2018). Application of experimental designs for genetic study. Bharatiya Krishi Anusandhan Patrika, 33(2): 177-180.

31. Sukanta D, Kumar, A, Mandal, BN, Lal, K, and Kumar, D (2018). Experiments with mixtures. Bharatiya Krishi Anusandhan Patrika, 33(2): 181-184.

1. Published a popular article entitled "Application of Genomic Selection in Bioinformatics" in Bhartiya Krishi Anusandhan Patrika authored by Neeraj Budhlakoti, D.C. Mishra, Devendra Arora and Rajeev Ranjan Kumar. Volume 33 Issue 4 (December 2018).

Reference Manual /Manual/ E-manual/Pamphlet

1. Chandra H. and Basak, P. (2018). Handling Large Scale Data and Data Analysis using R. Training manual. ICAR-IASRI, New Delhi, 167 pages.

2. Chandra H. and Singh, D. (2018). Advanced Sampling Techniques with Practical Examples from NSSO & Health Surveys. Training manual. ICAR-IASRI, New Delhi, 210 pages.

3. Chaturvedi K. K., Farooqi M. S., Lal S. B., Sharma A., Kumar S., Mishra D. C., Kaur M. (2018). Recent Advances in Agricultural Bioinformatics: Big Data Analytics Perspectives. Reference Manual-I and II. ICAR-Indian Agricultural Statistics Research Institute, New Delhi.

4. B N Mandal, Sukanta Dash and Anil Kumar (2018). Advances in Experimental Designs and Analysis, Vol – I and II. Reference manual for the CAFT training.

5. Varghese, C, Dash, S, Bhowmik, A, Ravisankar, N, Panwar, AS, Prusty, AK and Shamim, M(2018). AICRP on Integrated Farming Systems On-Farm farming system research:Online data submission and Analysis, User Manual released at V Bienneal workshop of AICRP on IFS organized at KVK, Bengaluru.

6. Chaturvedi K. K., Farooqi M. S., Lal S. B., Sharma A., Kumar S., Mishra D. C., Kaur M. (2018). Reference E-Manual in CD for CAFT program "Recent Advances in Agricultural Bioinformatics: Big Data Analytics Perspectives". ICAR-Indian Agricultural Statistics Research Institute, New Delhi.

Project Reports

1. Meher, PK, Sahu, TK, Raghunandan, K, Gahoi, S, Choudhary, NK, Rao, AR (2018). HRGPred: Prediction of herbicide resistant genes with k-mer nucleotide compositional features and support vector machine.

LECTURES DELIVERED

Outside

1. Delivered lecture on the topic of "Emerging areas- Small Area Statistics" in a training programme on "Survey Research Methodology for Researchers and Faculty" at ICMR-NIMS, New Delhi on 10 October, 2018.(Hukum Chandra)

2. Delivered an invited lecture on Estimation of Population Parameters-point estimate, interval estimate, confidence interval to the participants of the training programme entitled Survey Research Methodology for Researchers and Faculty organized jointly by ICMR-National Institute of Medical Statistics, New Delhi and Institute of Applied Statistics and Development Studies, Lucknow at ICMR-NIMS, New Delhi during October 08-10, 2018 (lecture was delivered on October 09, 2018) (Rajender Parsad).

3. Conducted an invited lecture and practical session on "Use of Phenomics resource databases and open access softwares for plant phenotyping" on 29 Oct 2018 in ICAR-short course on "Phenomics, the next generation phenotyping, for trait dissection and crop improvement" organized by ICAR-IARI, new Delhi.(Sanjeev Kumar)

4. Delivered invited lecture on "Time series analysis using R software" in 21 days Training Workshop entitled "Advances in Simulation Modelling and Climate Change Research towards Knowledge Based Agriculture" under ICAR-HRM Programme held during 13 November-03 December, 2018 at CESCRA, IARI and New Delhi. (Wasi Alam)

5. Delivered invited lecture on "Statistical tools for phenome data processing and data mining" in a Short Course for faculty training on phenomics from October 22-31, 2018: at ICAR-IARI, New Delhi.(Anil Rai)

6.   Delivered a lecture regarding Country Experience on Master Sampling Frame: India, on 21 November, 2018 during Regional Training for SAARC Countries on Master Sampling Frames for Agricultural Statistics in Kathmandu. (Kaustav Aditya)

7.   Delivered an invited lecture on Significance of Factorial Experiments and Web Resources in Agricultural Research at Department of Mathematics, IIT, Mumabi on November 26, 2018.(Rajender Parsad)

8.   Delivered a Lead Lecture in Technical session IV, Advances in FSR on the topic Statistical analysis methodology for farmer participatory FSR in the National Symposium on "Integrated Farming Systems for 3Es" organized at University of Agricultural Sciences, GKVK campus, Bengaluru during 23-24 December, 2018. (Cini Varghese)

9.   Delivered an invited lecture on Experimental Design and Data Management to the participants of the training programme on Breeding approaches for enhancing genetic gains in Grain Legumes and Dryland Cereals organized by Bioversity International-India officer during 10-14 December, 2018 at NASC Complex, New Delhi. (Rajender Parsad).

10. Delivered an Invited talk on "Machine learning Algorithms in Agri-genomics domain: some applications" in a Session on "Genomics for Health care" organized under National Workshop on Computation for Biomedicine and Healthcare" at IIIT Delhi on 12-12-2018. (A. R. Rao)

11. Delivered invited four lectures on 1. Genome annotation, 2. Signature development, 3. Antimicrobial peptide prediction in fishes, 4. Genomic data and IP issues and conducted practical sessions CAFT programme on Gene Mining Approaches and In Silico Functional Analyses during December 3-23, 2018 at ICAR-Central Institute of Fisheries Education, Mumbai. (Dinesh Kumar)

12. Delivered invited four lectures on Whole Genome Assembly , RAD data and marker discovery, Antimicrobial peptide prediction in fishes and Genomic data and IP issues and conducted practical sessions on following topics CAFT programme on Gene Mining Approaches and In Silico Functional Analyses during December 3-23, 2018 at ICAR-Central Institute of Fisheries Education, Mumbai. (MA Iquebal)

13. Delivered a lecture on "New techniques for use in operational crop yield forecasting" in IMD and Acharya N.G. Ranga Agricultural University, Andhra Pradesh on 6th December, 2018 at Regional Agricultural Research Station, Tirupati, Andhra Pradesh (K. N. Singh)

PAPERS PRESENTED

Conferences

National Workshop on Sustainability of Indian Agriculture: Socio-Economic Perspective organized at NASC Complex by ICAR-NIAP, New Delhi on November 27, 2018.

- Methodology for constructing composite index for sustainable agriculture
  (Rajender Parsad and B.M.K. Raju.)

Twenty-Seventh International Conference of Forum for Interdisciplinary Mathematics (FIM) in conjunction on Interdisciplinary Mathematics, Statistics and Computational Techniques organized by Department of Statistics, University of Jammu, Jammu during November 02-04, 2018.

- Significance of Factorial Experiments and Web Resources in Agricultural Research"
  (Rajender Parsad).

Tenth International Triennial Calcutta Symposium on Probability and Statistics (Celebrating the Birth Centenary of Prof. H. K. Nandi) organized jointly by The Calcutta Statistical Association and the Department of Statistics, Calcutta University during December 27-30, 2018.

- Incomplete Split Plot Designs: Construction and Analysis.
  (B.N. Mandal)
- Response Surface Designs with Minimum Level Changes.
  (Arpan Bhowmik)
- Block Designs for Incomplete Factorial Treatment Structure with Two Factors
  (Rajender Parsad)
- On the construction of Balanced Latin Hypercube Designs
  (H. K. Nandi)

V Biennial Workshop of AICRP on IFS on December 21, 2018.

- Progress on statistical analysis techniques for on-station experiments of cropping and farming system.
  (Susheel Kumar Sarkar)
- An algorithmic approach to construct D-optimal saturated designs for logistic model
  (Seema Jaggi)
- Modelling and forecasting of price of rice in India using long memory time series model
  (R.K. Paul)
- Modelling and Forecasting of Non-parametric Time-series with Correlated Errors using Simple Data Driven Bandwidth Choice
  (Soumen Pal)
- Modelling and forecasting of price of rice in India using long memory time series model
  (R.K. Paul)
- Calibration Estimation of Finite Population Regression Coefficient under Two-stage Sampling Design Using Single Auxiliary Variable
  (Basak, P.)
- Small Area Prediction of Counts Under a Spatial Non-Stationary Generalized Linear Mixed Model.
  (Basak, P.)

- Estimation of Regression Coefficient using Calibration Approach with Multi Auxiliary Variables
  (Kumari V.)

72nd Annual Conference of the Indian Society of Agricultural Statistics on the Theme Statistics, Informatics and Engineering Interventions - A Roadmap to Transform Indian AgricultureTowards Prosperity organized at ICAR-CIAE-Bhopal, during December 13-15, 2018.

- Mating plans for breeding programmes using generalized row- column designs.
  (Anindita Datta)
- Cost-efficient response surface designs.
  (Eldho Varghese)
- Affine resolvable partially balanced incomplete block designs.
  (Cini Varghese)
- Expression quantitative trait loci analysis in Barley.
  (Himadri Shekher Roy)
- Measuring nucleotide association: a statistical approach.
  (P.K. Meher)
- Wavelet based hybrid time series models and their applications.
  (R.K. Paul)
- Computational approaches to understand host pathogen interactions in foot-and-mouth disease (FMD) of cattle.
  (A. R. Rao)
- Application of Data Mining Techniques in Bioinformatics.
  (D.C. Misra)
- Big Data Handling in Agriculture: HPC, Hadoop or Spark.
  (K.K. Chaturvedi)
- Apache Spark for Bioinformatics Applications.
  (S.B. Lal)
- Development of computational tool for microsatellite DNA marker.
  (Sarika)
- Computational approach for breed and variety identification using molecular markers
  (M.A. Iquebal)
- The pattern and determinants of short term labour migration in India.
  (Anuja A R)
- Land Use Transformation Across Rural-urban Gradient of Bengaluru North - An Application of Markov Chain Analysis.
  (Harish Kumar H V)
- Diffusion modeling of tractor density in Indian State of Punjab.
  (Ravindra Singh Shekhawat)
- Comparative study between ARIMAX and Bayesian ARIMAX model.
  (Achal Lama)

- Impact of RKVY Expenditure on State Plan Agricultural Expenditure: A Co-integration Analysis.
  (Rajesh T)
- A hybrid wavelet based ANN-WNN model for forecasting Indian monsoon rainfall.
  (Mrinmoy Ray)
- E-governance of Krishi Kalyan Abhiyan using KVK Portal.
  (Alka Arora,)
- IVRI-Pashu Prajanan App: A Tool for Knowledge Dissemination on Animal Reproduction.
  (Mukesh Kumar)
- Data Sharing across Applications using Web API: Case Study of Mobile App and Web Portal.
  (Soumen pal)
- Application of AI in developing expert system on wheat crop management.
  (Sh. S. N. Islam)
- Estimation of crop yield at district level from reduced sample size of villages out of population.
  (Aditya, K)
- Small Domain Inference Combining Data from Two Independent Surveys.
  (Islam, S)
- Improved Estimation of Finite Population Mean involving two auxiliary variables in two phase sampling with subsampling the nonrespondent.
  (Chandra, H)
- Outlier(s) imputation of survey data using calibration approach.
  (Kumar, R)
- Estimation of Population Ratio using Calibration Approach.
- (Kumar, R)
- Calibration Approach Based Estimation of Regression Coefficient using Auxiliary Data.
  (Kumari, V)

Technical Session

V Biennial Workshop of AICRP on IFS organized at University of Agricultural Sciences, GKVK campus, Bengaluru during 20-22 December, 2018.

- Progress on statistical analysis techniques for on-farm nutrient response and farming system experiments (OFR 1, 2 &3)
  (Dr. Cini Varghese)

Invited Talk

72nd Annual Conference of Indian Society of Agricultural Statistics (ISAS) held at ICAR-CIAE, Bhopal during December, 13-15, 2018.

- Technology forecasting for envisioning Bt technology scenario in Indian agriculture

(Ramasubramanian V.)
- Learning Analytics for Academic Performance Evaluation" in the session on "Advanced Statistics
  (Shashi Dahiya)

PARTICIPATION

International Conference/ Workshop/Symposium etc.

- International Conference of Asia Pacific Federation for Information Technology in Agriculture (AFITA) and World Congress on Computers in Agriculture (WCCA) on Research Frontiers in Precision Agriculture held at IIT Mumbai during 24th to 26th October, 2018.
  (Mukesh Kumar, Anshu Bharadwaj and Mr. S.N. Islam)
- Twenty-Seventh International Conference of Forum for Interdisciplinary Mathematics (FIM) in conjunction with third Convention of IARS on Interdisciplinary Mathematics, Statistics and Computational Techniques organized by Department of Statistics, University of Jammu, Jammu (IMSCT 2018 –FIM XXVII) during November 02-04, 2018.
  (Rajender Parsad)
- Tenth International Triennial Calcutta Symposium on Probability and Statistics (Celebrating the Birth Centenary of Prof. H. K. Nandi) organized jointly by The Calcutta Statistical Association and the Department of Statistics, Calcutta University during December 27-30, 2018 at the Department of Statistics, Calcutta University, Kolkata, India.
  (Seema Jaggi, Rajender Parsad, B.N. Mandal, Sukanta Dash, Arpan Bhowmik, R.K. Pau, Mrinmoy Rao, Pradip Basak)
- International Conference on Emerging Innovations in Statistics & Operations Research (EISOR 2018) at M.D. University, Rohtak (Haryana) during 27-30 December, 2018.
  (Hukum Chandra)

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

- Hukum Chandra participated in a training programme on "Survey Research Methodology for Researchers and Faculty" at ICMR-NIMS, New Delhi during 08-10 October, 2018.
- Seema Jaggi and Rajender Parsad participated in Agri-Startup and Entrepreneurship Conclave on Unleashing Potentials in Agriculture for Young Agripreneurs (UPAYA) organized by Indian Council of Agricultural research at NASC Complex, New Delhi during October 16-17, 2018.

- Dinesh Kumar attended launch workshop on October 3, 2018 under research project Molecular markers for improving reproduction of cattle and buffalo funded by Bill and Melinda Gates foundation.
- Sarika attended launch workshop on October 3, 2018 under research project Molecular markers for improving reproduction of cattle and buffalo funded by Bill and Melinda Gates foundation.
- Mir Asif Iquebal attended launch workshop on October 3, 2018 under research project Molecular markers for improving reproduction of cattle and buffalo funded by Bill and Melinda Gates foundation.
- Rajender Prashad participated in National Workshop on Sustainability of Indian Agriculture: Socio-Economic Perspective organized at NASC Complex by ICAR-NIAP, New Delhi on November 27, 2018.
- Kaustav Aditya and Dr Pradip Basak participated in the regional training workshop on Master Sampling Frames for Agricultural Statistics jointly organized by Regional Office of the Global strategy, Food and Agricultural Organization of the United Nations and SAARC Secretariat during 19-23 November, 2018 at Kathmandu, Nepal.
- R.K.Paul attended national conference of Indian Society of Agricultural Marketing during 22-24 November, 2018 at Institute for Social and Economic Change, Bengaluru.
- Wasi Alam attended 21 days Training Workshop on "Advances in Simulation Modelling and Climate Change Research towards Knowledge Based Agriculture" under ICAR-HRM Programme held during 13th November– 3rd December, 2018 at CESCRA, IARI and New Delhi.
- U.B. Angadi as resource person attended workshop on feed resource mapping at ILRI, ICRISAT, Hyderabad, on 16 to 18th November 2018.
- R.K.Paul attended 72nd national conference of Indian Society of Agricultural Statistics during 13-15 December, 2018 at ICAR-CIAE, Bhopal.
- Ramasubramanian V. attended 72nd Annual Conference of Indian Society of Agricultural Statistics (ISAS) held at ICAR-CIAE, Bhopal during December, 13-15, 2018.
- K. N. Singh participated at 9th ARM on FASAL project jointly organised by IMD and Acharya N.G. Ranga Agricultural University, Andhra Pradesh on 6th December, 2018 at Regional Agricultural Research Station, Tirupati, Andhra Pradesh.
- Wasi Alam attended 21 days Training Workshop on "Advances in Simulation Modelling and Climate Change Research towards Knowledge Based Agriculture" under ICAR-HRM Programme held during 13th November– 3rd December, 2018 at CESCRA, IARI and New Delhi.
- Shivaswamy G.P. participated in 72nd conference of ISAS held at ICAR-CIAE, Bhopal during 13-15 December, 2018.

- Sudeep attended 72nd national conference of Indian Society of Agricultural Statistics during 13-15 December, 2018 at ICAR-CIAE, Bhopal.
- Anil Rai attended 72nd national conference of Indian Society of Agricultural Statistics during 13-15 December, 2018 at ICAR-CIAE, Bhopal.
- Seema Jaggi, Rajender Parsad, Cini Varghese, Susheel Kumar Sarkar, Anindita Datta participated in 72nd Annual Conference of the Indian Society of Agricultural Statistics on the Theme Statistics, Informatics and Engineering Interventions - A Roadmap to Transform Indian Agriculture Towards Prosperity organized at ICAR-CIAE-Bhopal, M.P. during December 13-15, 2018.
- Cini Varghese and Susheel Kumar Sarkar participated in the V Biennial Workshop of AICRP on IFS organized at University of Agricultural Sciences, GKVK campus, Bengaluru during 20-22 December, 2018.
- Cini Varghese and Susheel Kumar Sarkar participated in the National Symposium on "Integrated Farming Systems for 3Es" organized at University of Agricultural Sciences, GKVK campus, Bengaluru during 23-24 December, 2018.
- Rajender Parsad, Seema Jaggi, Susheel Kumar Sarkar, Sukanta Dash, Arpan Bhowmik, Anindita Datta participated in the Third National Workshop of Officer Incharge, Data Management (ICAR Research Data Repository for Knowledge Management) KRISHI during December 4-5, 2018 organized by ICAR-IASRI at NASC, New Delhi.
- Tauqueer Ahmad attended 72nd ISAS conference as Chairman and Convener of the session of Geo-statistics and Remote Sensing at ICAR-CIAE, Bhopal during 13-14 December, 2018.
- Hukum Chandra attended workshop on "Small Area Estimation Techniques and its Applications" at Eastern Africa Statistical Training Centre, Dar Es. Salaam, Tanzania during 03-07 December, 2018.
- Prachi Misra Sahoo and Deepak Singh participated in the 72nd Annual Conference of Indian Society of Agricultural Statistics organised at ICAR-CIAE, Bhopal, Madhya Pradesh during 13-15 December, 2018.

Consultancy/Advisory Services Provided

- Ramasubramanian V. gave advice to Avinash Goyal, M.Sc. (Agricultural Physics) student of IARI on weather indices based regression modelling of Mustard yield prediction on 09.10.2018.
- U.B. Angadi
- Consultancy service project with International Livestock Research Institute (ILRI) is in progress and total consultancy fee is Rs.3,96,750/- for 23 man-days

- 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.
- Anil Rai providing consultancy project "The study on field testing of the developed guidelines on estimating post-harvest losses of horticultural crops, livestock products and fish and fish products" Funded by FAO, Rome.
- K.K. Chaturyedi providing the consultancy service to "Centre for Genetic Manipulation of Crop Plants (CGMCP)", University of Delhi, South Campus, New Delhi for bioinformatics data analysis at ASHOKA.
- Himadri Shekher Roy analysis is done and given to M. C. Gupta, Scientist, Rasi Seeds (P) Ltd regarding path analysis, Genotypic correlation, phenotypic correlation, Divergence analysis etc.
- Anu Sharma provided consultancy to Rajesh Kumar Vaid, Principal Scientist, Veterinary Type Culture Collection, National Research Center on Equines, Sirsa Road, Hisar in analyzing their metagenome data.
- Anu Sharma Provided consultancy to Renu, NBAIM, Mau in analyzing their metaproteomic data.
- Anil Rai providing consultancy project "The study on field testing of the developed guidelines on estimating post-harvest losses of horticultural crops, livestock products and fish and fish products" Funded by FAO, Rome.
- M. A. Iquebal advisory services provided to Rukam Singh Tomar, Associate Professor, JAU, Junagadh regarding sample collection regarding transcriptome data analysis.
- Sarika advisory services provided to Reeta Bhatia, Scientist, IARI, New Delhi regarding molecular marker data analysis for phylogenetic analysis.
- Arpan Bhowmik advisory services provided to Mr. Gaurav Singh, SRF at Water Technology Centre, IARI and a Ph.D. Scholar in Amity University was advised on the use of Principal Component Analysis (PCA) with respect to 19 physiochemical variables affecting different sites in terms of pollution alongside Kali River water. The data pertaining to summer and winter season respectively and the analysis were carried out for both the seasons separately. Important determinants were identified in terms of pollution alongside Kali River water. Further, different polluting sites were grouped based on their similarity w.r.t. pollution. The groupings of different polluting sites were also verified using Hierarchical Cluster Analysis (HCA). Both PCA and HCA yields similar results.

- Arpan Bhowmik advisory services provided to Mrs. Chabi Gupta, a Ph.D. Scholar from XLRI, Jamshedpur on the use of Path analysis to study the cause effect relationship between different psychological variable under two different context.
- U.B. Angadi
- Consultancy service project with International Livestock Research Institute (ILRI) is in progress and total consultancy fee is Rs.3,96,750/- for 23 man-days
- 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.
- Anil Rai providing consultancy project "The study on field testing of the developed guidelines on estimating post-harvest losses of horticultural crops, livestock products and fish and fish products" Funded by FAO, Rome.
- Deepak Singh provided consultancy to Dr. Bansa Singh, ICAR- Indian Institute of Pulses Research, Kanpur for analysis for addressing environmental interaction towards exploration of resistance against root knot nematode in mungbean.
- Sh Deepak Singh provided consultancy to Principal Coordinator, MULLaRP ICAR-Indian Institute of Pulses Research, Kanpur for analysis for Multilocation trials for resistant genotypes to rust in lentil.
- Sh Raju Kumar provided consultancy to Archana Anokhe, Ph.D. student of Division of Entomology, Indian Agricultural Research Institute, New Delhi for analyzing the data for Bemisia tabaci (Gennadius) (Hemiptera: Aleyrodidae) population collected from different agro ecological zone.
- Sh Raju Kumar provided consultancy to Bansa Singh, ICAR- Indian Institute of Pulses Research, Kanpur for analysis for addressing environmental interaction towards exploration of resistance against root knot nematode in mungbean.

SOFTWARE DEVELOPED

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

- R package pscGraph finalized for protein structure comparison using Graph partitioning (Method U.B. Angadi, M.A. Iquebal, Sarika, Anil Rai and Dinesh Kumar)

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- Sample Survey Resources Server
(SW-9073/2017)
(V.K. Gupta, U.C. Sud, Anshu Bharadwaj, Hukum Chandra and Rajender Parsad)

स्वच्छ भारत

एक कदम स्वच्छता की ओर

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

Agri search with a human touch

Compiled and Edited by

LM Bhar

Ajit

Ramasubramanian V.

Shashi Dahiya

Susheel Kumar Sarkar

Sarika

Mrinmoy Roy

Anindita Dutta

Himadri Shekhar Rai

Sushil Kumar

BJ Gahlot