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

From Director's desk……………

Sampling methodology for generating State level estimates of crop area and yield from the sample sizes recommended by Prof Vaidyanathan Committee report has been developed. During past few agricultural years, it was observed that a total number of 13,00,000 (approximately) Crop Cutting Experiments (CCEs) were conducted in India every year to find out the crop yield estimates of several major and minor crops. To tackle with the issue of reducing the number of CCEs, a pilot study was conducted in five states in around 4700 villages with reduced number of CCEs conducted under each crop. It was found that, the estimates obtained from reduced sample size (reduced number of CCEs w.r.t. GCES), produced reliable estimates with acceptable level of precision for major food grain crops only at State level but not at district level.

An integrated sampling methodology for crop yield estimation for Crop Insurance using field surveys, Remote sensing, GIS and Spatial interpolation techniques has been developed in order to optimize the number of Crop Cutting Experiments (CCEs) being conducted under Pradhan Mantri Fasal Bima Yojna (PMFBY). In order to develop this methodology, the survey was conducted in Buldhana district of Maharastra State during kharif season for Cotton crop as well as Murena district of Madhya Pradesh for Mustard crop and Barabanki district of Uttar Pradesh State for Wheat crop during rabi season. The study has revealed encouraging results with significant reduction in CCEs in producing reliable estimates of crop yield.

An R Package named "ispd" has been developed. The package is available at https://cran.r-project.org/web/packages/ispd/index.html).This package is a collection of several functions related to construction and analysis of incomplete split-plot designs. The package contains functions to obtain and analyze incomplete split-plot designs for three kinds of situations namely (i) when blocks are complete with respect to main plot treatments and main plots are incomplete with respect to subplot treatments, (ii) when blocks are incomplete with respect to main plot treatments and main plots are complete with respect to subplot treatments and (iii) when blocks are incomplete with respect to main plot treatments and main plots are incomplete with respect to subplot treatments.Four web applications/R-modules have been published: Balanced Incomplete Latin Square Designs

(http://drsr.icar.gov.in/BILS/); Incomplete Block Designs (http://drsr.icar.gov.in/IBD/); Construction of Orthogonal Latin Hypercube Designs (http://drsr.icar.gov.in/OLH/); Incomplete Split Plot Designs: Construction and Analysis (http://drsr.icar.gov.in/ISPD/).

Three training programs were conducted on a wide range of topics viz., PBS Administration and Analytics, Statistical techniques/ Advances for agricultural data analysis, and Online submission and analysis of On-Farm farming systems research data and preparation of promising farming systems for scaling up. Copy right for eleven research achievements have granted. I am also glad to announce that a good number of publications have come out during this period.

It is hoped that the contents of this Newsletter would be informative and useful. Any suggestion for improving the contents of the newsletter is always welcome.

(Lal Mohan Bhar)

HONOURS/ AWARDS

- Mrinmoy Ray honoured with Jawaharlal Nehru Award for P.G. Outstanding Doctoral Thesis Research in Agricultural and Allied Sciences 2018 – Social Sciences by ICAR.
- Sudhir Srivastava received financial aid award from the National Institutes of Health (NIH) R01 project of J. Christopher States for Summer 2019 at University of Louisville, USA

RECOGNITIONS

- Anil Rai chairman of the committee for conducting examination of the recruitment of administrative personals in ICAR.
- Anil Rai Member of Counselling Steering Committee for admission of UG/PG/Ph.D. students in different agricultural universities,
- Anil Rai Member of DPC at ICAR-Research Complex for Eastern Region, Patna for the promotion of scientists
- Rajender Parsad Expert/Resource Person in the Workshop on Curriculum updation of Masters in Statistics, Department of Statistics, University of Jammu, Jammu on July 26, 2019.
- Hukum Chandra was the Expert Member, Giri Institute of Development Studies, Lucknow (Uttar Pradesh).
- Anil Rai member of "Inter-ministerial committee on National Policy of Biological Data storage and sharing" in DBT New Delhi.
- Anil Rai representing DG. ICAR in meeting on "Implementation of National Strategy on AI (NSAI)" in North Block under the Chairmanship of Secretory Expenditure, Govt. of India on August 08, 2019.
- Hukum Chandra was the Expert Member, Giri Institute of Development Studies, Lucknow, Uttar Pradesh, 2019. (attended meeting during 02-03 August, 2019).
- Hukum Chandra was the Expert Member, Maas Institute of Development Studies, Govt. of Tamil Nadu, Chennai. (attended meeting during 09-10 August, 2019).

VISITS ABROAD

- Hukum Chandra was the Resource Person in the training programme on "Statistical Analysis of Disaggregated SDG Indicators for Inclusive Development Policies" at United Nations-Statistical Institute for Asia and the Pacific (UN-SIAP), Chiba, Japan during 07 June - 12 July, 2019.

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

- An Expression of Interest for GP (Gram Panchayat) level Crop Yield Estimation Using Technology was invited by Government of India Ministry of Agriculture & Farmers' Welfare, Department of Agriculture, Cooperation & Farmers' Welfare through Mahalanobis National Crop Forecast Centre. Under this a project proposal entitled '*Integrated Sampling Methodology for Crop Yield Estimation at Gram Panchayat Level using Advanced*

Technologies for Crop Insurance' was formulated and submitted to Mahalanobis National Crop Forecast Centre, New Delhi. The presentation of the project proposal was also made in front of the Expert Committee

- A new project proposal entitled "Feasibility Study for Developing Renewable Energy Systems for Tea Plantations in Assam" as a part of Research collaboration (MoU) between ICAR and IIT Delhi has been presented on 31 July, 2019 at NASC Complex, Pusa, New Delhi under the Chairmanship of T. Mohapatra, Secretary, DARE & DG, ICAR and in presence of Director IIT, Delhi.

- New project entitled "Detection of outliers in presence of masking and imputation of data when auxiliary variables are available in sample surveys" was initiated from 23 July, 2019.

- Incomplete split plot designs: construction and analysis. Extramural research project funded by SERB (16.8.2016-15.8.2019) (PI: BN Mandal, Co-PI: Sukanta Dash and Rajender Parsad) has been completed and project report submitted to PME cell.

HUMAN RESOURCE DEVELOPMENT

Training programs organize

S.N	TITLE	VENUE	PERIOD	NUMBER OF PARTICIPANTS
1.	**working with Job submission, PBS administration and PBS Analytics** *Course Director* K.K. Chaturvedi	**ICAR-IASRI, New Delhi**	**24.07.2019**	--
3.	**On-line submission and analysis of ON-FARM farming systems research data and preparation of promising farming systems for scaling up** *Course Directors* Cini Varghese, Sukanta Dash Arpan Bhowmik	**ICAR-IIFSR, Modipuram**	**27.08.2019 To 27.08.2019**	--

CONFERENCES/ WORKSHOPS/ SYMPOSIA/ MEETINGS ETC. ORGANIZED

- Dinesh Kumar, Sarika, M.A. Iquebal organized a meeting with scientists from ICAR-IIWBR, Karnal for discussion on the progress of ongoing CABin Scheme Project and development of new CABin Scheme project.

- K.K. Chaturvedi organized a meeting under the chairmanship of ADG (ICT) with Computer Scientists of the institute on 19th July 2019 in the institute to discuss AI applications in Agriculture.

- Anil Rai organized a meeting on "Finalization of EFC of Crops and Horticulture institutions" under Network project on "Agricultural Bioinformatics and Computational Biology" at ICAR-IASRI New Delhi, on August 03, 2019.

- Anil Rai organized a meeting on "Finalization of EFC of Animal and Fisheries science institutions" under Network project on "Agricultural Bioinformatics and Computational Biology" at ICAR-IASRI New Delhi, on August 07, 2019.

- Anil Rai organized meeting on "MoU between ICAR and MSME" under the Chairmanship of DG ICAR on August 21, 2019.

- Anil Rai organized meeting on "Collaboration between CSC and ICAR with CEO" in CSC New Delhi on August 23, 2019.K.K. Chaturvedi organized one day training on working with Job submission, PBS administration and PBS Analytics on 24th July 2019.

- As Member-Secretary, Hukum Chandra organized meeting of the Quinquennial Review Team (QRT) of ICAR-IASRI for the period of 2011-12 to 2018-19 at ICAR-IASRI, New Delhi on 23 and 27 August, 2019.

PUBLICATIONS

Research Papers

1. 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.

2. Jasrotia, Rahul Singh, Yadav, Pramod Kumar, Iquebal, Mir Asif, Bhatt, S.B., Arora, Vasu, Angadi, U.B., Toma,r 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).

3. Shyamsundar 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

4. 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

5. 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,

6. 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.

7. 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_2 and Temperature on Growth of Rice Crop. International Journal of Current Microbiology and Applied Sciences. 8(1), 1906-1911.

8.   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.

9.   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.

10. 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.

11. 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.

12. Bibwe, B, Mani, I, Kar, A, Samuel, DVK., Iquebal, MA (2019). Optimization of oil loading and starch-protein ratio for encapsulation of flaxseed oil using response surface methodology. Journal of Agricultural Engineering, 56(2): 80-90.

13. Rasal, KD, Iquebal, MA, Pandey, A, Behera, P, Jaiswal, S, Vasam, M, Dixti, S, Raza, M, Sahoo, L, Nandi, S, Angadi, UB, Rai, A, Kumar, D, Nagpure, N, Chaudhari, A and Sundaray, JK (2019) Revealing liver specific microRNAs linked with carbohyate metabolism of farmed carp, Labeo rohita (Hamilton, 1822). Genomics (https://www.sciencedirect.com/science/article/pii/S088875431930237X?via%3Dihub).

14. Rasal, KD, Iquebal, MA, Jaiswal, S, Dixit, S, Vasam, M, Nandi, S, Raza, M, Sahoo, L, Angadi, UB, Rai, A, Kumar, D, and Sundaray, JK (2019). Liver specific microRNAs identification in farmed carp, Labeo bata (Hamilton, 1822) fed with starch diet using high-throughput sequencing. Marine Biotechnology (https://link.springer.com/article/10.1007/s10126-019-09912-y)

15. Chakraborty, D, Sehgal, VK, Dhakar, R, Ray, M and Das, DK (2019). Spatio-temporal trend in heat waves over India and its impact assessment on wheat crop. Theoretical and Applied Climatology. https://doi.org/10.1007/s00704-019-02939-0

16. Rathore, SS, Shekhawat, K, Singh, RK, Updhyay, PK, Shekhawat, R and Premi, OP (2019). Effect of nano-particles on growth, productivity, profitability of Indian mustard (Brassica juncea) under semi-arid conditions. Indian Journal of Agricultural Sciences, 89(7): 1045-50.

17. Pal, S. and Mazumdar, D (2019). Forecasting monthly rainfall using artificial neural network. RASHI, 3(2):65-73.

18. Chakraborty, D, Mondal, S, Das, A, Paul, AK, Thomas, P, Aggarwal, P, Behera, UK and Sharma, AR (2019). Tillage and Crop Rotation Effects on Mechanical Properties and Structural Stability of a Sandy Loam Soil in a Semi-arid Environment Journal of the Indian Society of Soil Science. 67(2):174-182.

19. Saha, A, Singh, KN, Ray, M, Kumar, S and Rathod, S (2019). A new approach for spatio-temporal modelling and forecasting based on fuzzy techniques in conjunction with k-means clustering. Journal of the Indian Society of Agricultural Statistics. 73 (2): 111-120.

20. Awasthi, S, Sharma, A, Saxena, P, Yadav, J, Pandiyan, K, Kumar, M, Singh, A, Chakdar, H, Bhowmik, A, Kashyap, PL, Srivastava, AK and Saxena, AK (2019). Molecular detection and in silico characterization of cold shock protein coding gene (cspA) from cold adaptive Pseudomonas koreensis. Journal of Plant Biochemistry and Biotechnology. Available at https://doi.org/10.1007/s13562-019-00500-8(.01)

21. Dash, S, Mandal, BN, Parsad, R and Sarkar, SK (2019). A Note on Second Order Orthogonal Latin Hypercube Designs, Journal of the Indian Society of Agricultural Statistics, 73(2):133-136.

22. Singh, S, Gupta, S, Dash, S and Singh, KN (2019). Modelling the growth of lactic acid bacteria-starter culture for foods. Journal of Indian Society of Agricultural Statistics. 73(2):161-165.

23. Devi, I, Singh, P, Lathwal, SS, Dudi K, Singh, Y, Ruhil AP, Kumar, A, Dash, S and Malhotra, R (2019). Threshold values of acoustic features to assess estrous cycle phases in water buffaloes (Bubalus bubalis), Applied Animal Behaviour Science. https://doi.org/10.1016/j.applanim.2019.104838.

24. Rai, SN, Srivastava, S, Pan, J, Wu, X, Rai, SP, Mekmaysy, CS, DeLeeuw, L, Chaires, JB and Garbett, NC (2019). Multi-group diagnostic classification of high-dimensional data using differential scanning calorimetry plasma thermograms. PLOS ONE 14(8): e0220765. https://doi.org/10.1371/journal.pone.0220765

25. Ali, A, Kumar, R, Iquebal, MA, Jaiswal, S, Kumar, D and khan, A (2018). Role of conserved residues in catalytic activity of NDM-1: an approach of site directed mutagenesis and molecular dynamics. Physical Chemistry Chemical Physics-a Journal of Royal Society of Chemistry. (https://pubs.rsc.org/en/content/articlelanding/2019/cp/c9cp02734c/unauth#!divAbstract)

26. Pal, S, Marwaha, S, Arora, A, Choubey, AK, Singh, AK, Poswal, RS, Adhiguru, P, Islam, SN, Kumar, H, Gupta, C and Kumar, S (2019). KVK Mobile App: An ICT tool to empower farmers. Indian Journal of Agricultural Sciences, **89**(8):1362-5.

Popular Articles

- 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.

Reference Manual /Manual/ E-manual/Pamphlet –

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

- Dheri, G. S., Pal, S., Singh, V., Marwaha, S. and Choudhary, O. P. (2019). Hands-on Training on Statistical Tools and Database Management in Agriculture. E- Manual of training programme under ICAR NAHEP-CAAST-SNRM organized in collaboration with ICAR-IASRI (under NAHEP Component 2) during June 10-15, 2019, Punjab Agricultural University, Ludhiana Publication.

- Sudeep Marwaha, Shashi Dahiya, Anshu Bharadwaj and Soumen Pal (2019) Compiled and Edited the Document under NAHEP Component 2A Project - "First Open Call for Course Content Creation and Review of e-Learning Courses" .

- Cini Varghese, Sukanta Dash and Arpan Bhowmik, N. Ravisankar, Raghuveer Singh and A.S. Panwar (2019). AICRP on Integrated Farming Systems On-farm Farming Systems Research: Online data submission and analysis.

- Sudeep Marwaha, Shashi Dahiya, Anshu Bharadwaj and Soumen Pal (2019) Compiled and Edited the Document under NAHEP Component 2A Project - "First Open Call for Course Content Creation and Review of e-Learning Courses".

Project Reports

- Mandal, B. N., Parsad, R. and Dash, S. (2019). Incomplete split-plot designs: construction and analysis. Extramural research project funded by Science and Engineering Research Board, File No. EMR/2015/000517.
- Chaturvedi, KK, Farooqi, MS, Lal, SB, Mishra, DC and Kumar, S (2019). Platform for integrated genomics warehouse. Project Report No. ICAR-IASRI/PR-07/2019. IASRI Publication.

Web Applications

1. Dash, S., Mandal, B.N., Parsad, R. and Gupta, V.K. (2019). Balanced Incomplete Latin Square Designs: R module on Design Resources Server, ICAR-Indian Agricultural Statistics Research Institute, New Delhi 110 012, India. http://sr.icar.gov.in/BILS/.
2. Mandal, B.N., Parsad, R. and Dash, S. (2019). Incomplete Block Designs: R module on Design Resources Server, ICAR-Indian Agricultural Statistics Research Institute (IASRI), New Delhi 110 012, India. http://sr.icar.gov.in/IBD/
3. Dash, S., Mandal, B.N., Parsad, R. and Sarkar, S. K. (2019). Construction of Orthogonal and Nested Orthogonal Latin Hypercube Designs: R module on Design Resources Server, ICAR-Indian Agricultural Statistics Research Institute, New Delhi 110 012, India. http://sr.icar.gov.in/OLH/
4. Mandal, B.N., Dash, S. and Parsad, R. (2019). Incomplete Split Plot Designs: Construction and Analysis: R module on Design Resources Server, ICAR-Indian Agricultural Statistics Research Institute (IASRI), New Delhi 110 012, India. http://sr.icar.gov.in/ISPD/

Other Publications

- Ahmad, T, Sahoo, PM, Biswas, A, Singh, D, Kumar, R and Basak, P (2019). Agricultural Research Data Book 2019. ICAR-IASRI Publication.

LECTURES DELIVERED

Outside

1. Delivered lectures on the topics "Cluster analysis", "principal component analysis", "Artificial Neural Networks" and "Non-parametric testing" on 13th June, 2019 at PAU, Ludhiana in training programme entitled "Statistical Tools and Database Management in Agriculture" organized by Department of Soil Science, PAU, Ludhiana during 10-15 June, 2019 at PAU, Ludhiana. (Mrinmoy Ray)
2. Delivered lecture on the topic "Descriptive statistics using SPSS" on 11th June, 2019 at PAU, Ludhiana in training programme entitled "Statistical Tools and Database Management in Agriculture" organized by Department of Soil Science, PAU, Ludhiana during 10-15 June, 2019 at PAU, Ludhiana. (Sh Raju Kumar)

3. Delivered lecture on the topic "Tests of Significance Based on Z, t, chi-square and F Distributions" on 11 June, 2019 at PAU, Ludhiana in training programme entitled "Statistical Tools and Database Management in Agriculture" organized by Department of Soil Science, PAU, Ludhiana during 10-15 June, 2019 at PAU, Ludhiana. (Sh Raju Kumar)

4. Delivered three invited lectures in a training program on Analysis using Statistical Package organized at Jaganath International Management School, Vasant Kunj, New Delhi on 28 May, 2019 on the topics; i) Exploratory Data Analysis using R, ii) Tests of Significance Based on Z, t, chi-square and F Distributions, and iii) Analysis of survey data using R. (Kaustav Aditya).

5. Delivered invited lecture on "NGS data analysis: genome assembly and antimicrobial prediction" during ICMR sponsored training National workshop on Clinical and translational research on bacteriophages as promising antimicrobial alternatives for therapeutics, prophylaxis and food safety" organized at ICAR-National Research Centre on Equine, Hisar on July 30, 2019. (Mir Asif Iquebal)**.**

6. Delivered an Invited Lecture on Constructing Composite Index: Methodological Perspective to the participants of the Training Programme on Agricultural Policy Analysis and Communication for African Nationals organized at ICAR-NIAP, New Delhi during August 16-25, 2019 (lecture was delivered on August 19, 2019). (Rajender Parsad)

7. Delivered an Invited Lecture on Information System for AICRP on Fruits to the participants of the Training-cum-Interface Meeting on Project Appraisal and Research Data Management of ICAR-AICRP on Fruits organized by AICRP on Fruits at ICAR-IIHR, Bengaluru during August 19-21, 2019 (lecture was delivered on August 19, 2019 through Google Hangout) ((Rajender Parsad).

8. Delivered 03 invited lectures on 1. Principal Component Analysis, 2. Logistic Regression and 3. Web Resources on Statistical Sciences and KRISHI Portal to the participants of the Training Programme on Different Statistical Tools organized by Directorate of Economics and Statistics, Dehradun, Uttarakhand at Financial Training and management Institute, Suddhowala, Dehradun during August 19-22, 2019 (Lectures were delivered on August 20, 2019). (Rajender Parsad)

9. Delivered a lecture on "online submission and analysis methodology of OFR data" in a training programme on "On-line submission and analysis of on-farm farming systems research data and Preparation of promising farming systems for scaling up in collaboration with ICAR-IIFSR during 27-29 August, 2019. (Cini Varghese)

10. Delivered a lecture on SAS, SPSS and R software: Basics during a training programme on "On-line submission and analysis of ON-FARM farming systems research data and preparation of promising farming systems for scaling up" jointly organized by ICAR-IASRI. New Delhi and ICAR-IIFSR, Modhipuram at ICAR-IIFSR, Modipuram during 27-28 August, 2019 [Arpan Bhowmik and Sukanta Dash].

11. Delivered a lecture on 20th August, 2019 on the topic "Forecasting prices of agricultural commodities" in the training programme on "Agricultural policy analysis and

communication" for African Nationals during 16-25 August, 2019 organized by ICAR-NIAP, New Delhi. (Ranjit Paul)

PAPERS PRESENTED

Invited talk

Altair's Annual Altair Technology Conference (ATC): High PerformanceComputing (HPC) Track held at Le Meridian Windsor Place, New Delhi on 14th June 2019
Maintaining and Managing Supercomputing Resources in Agriculture
(K.K. Chaturvedi)

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
Designing, analysis and data management in AICRP Trials Invied Talk)
(Rajender Parsad)

National Workshop on Agricultural Sustainability: Methods and Weight Determination organized jointly by   Amity University, Amity Institute of Organic Agriculture and ICAR-NIAP, New Delhi at Amity University, Noida on August 31, 2019)
Methodology for Constructing Index for Sustainable Agriculture.
(Rajender Parsad and BMK Raju)

PARTICIPATION

International Conference/ Workshop/Symposium etc.

- Hukum Chandra participated in the training programme on "Statistical Analysis of Disaggregated SDG Indicators for Inclusive Development Policies" at United Nations-Statistical Institute for Asia and the Pacific, Chiba, Japan during 07 June - 12 July, 2019.

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

1. 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
2. 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
3. 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.
4. S.B.Lal participated in Management and Functioning of HPC meeting on 10th June, 12th June, 15th June and 25th June 2019
5. S.B.Lal participated in Operational management and maintenance of HPC resources on 21st May 2019.

6. S.B.Lal participated in Altair's annual Altair Technology Conference (ATC) on 14th June 2019 at Le Meridian Windsor Place, New Delhi.

7. K.K. Chaturvedi participated in Management and Functioning of HPC meeting on 10th June, 12th June, 15th June and 25th June 2019.

8. K.K. Chaturvedi participated in Operational management and maintenance of HPC rsources on 21st May 2019.

9. U.B. Angadi attended the Altair ATCx 2019 Conference at New Delhi on 14/6/2019.

10. U.B. Angadi attended the Statistics Day on 29/6/2019 at Vigyan Bhawan, New Delhi

11. Md. Samir Farooqi attended the National Statistics Day workshop on 29.06.2019 (Saturday) at Plenary Hall, Vigyan Bhawan, Maulana Azad Road, New Delhi.

12. Mrinmoy Ray Participated in the "Workshop on Applied Deep Learning" organized   by MANAS LAB, School of Computing and Electrical Engineering, held from 1st to 5th July, 2019 at IIT Mandi.

13. Mukesh Kumar and Mr. Pal Singh Participated in 5 days Workshop on Applied Deep Learning at IIT Mandi during 01-05 July, 2019.

14. Ramasubramanian V. attended the last three days of the Five days Training Workshop on Applied Deep Learning (01-05, July, 2019) at IIT, Mandi, Himachal Pradesh.

15. Susheel Kumar Sarkar attended KRISHI workshop with steering committee on August 26, 2019.

16. Mukesh Kumar, Alka Aror, Anshu Bharadwaj and Soumen Pal participated   NAHEP first Annual Review Workshop at NASC Complex, New Delhi during 5-6 August, 2019.

17. Mukesh Kumar and Anshu Bharadwaj attended Users Conference organized by Esri at Gurugram during 28-29 August 2019.

18. Mukesh Kumar attended three days training Effective Development Programme (EDP) on Development Effective Organizational Leadership for Senior Officers of ICAR at ASCI, Hyderabad during 09-11 August, 2019.

Consultancy/ Advisory services provided:

– Rajender Parsad 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 a line x tester experiment (9 lines and 3 testers). The advisory was provided along with Sukanta Dash.

– B.N. Mandal 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.

– B.N. Mandal 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.

– B.N. Mandal 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.

- B.N. Mandal 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 advisory services provided to Niveta 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.

- Arpan Bhowmik 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 location, test vs control contrast was 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 was 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 provided advisory service to Mr. Deepak Kumar, M.Sc. (Ag.), Department of Plant Breeding and Genetics, BAU, Sabour, Bhagalpur, Bihar.

- Ravina Singh Shekhawat provided onsultancy service to Kapilla Shekhawat, Senior Scientist, Division of Agronomy, IARI, analyzed weed intensity data of different cropping system by using PCA.

- Ravina Singh Shekhawat provided onsultancy service to AnshuAhlawat, Associate Professor of Junagadh Agricultural University, Gujarat to application of ANN in the lactation of milk.

- Mir Asif Iquebal advised to Prachi Shripatrao Yadav, Scientist, IARI, New Delhi regarding experimental designing for whole genome data generation.

- Sarika advised to Chiranjit Kaur, Principal Scientist, IARI, New Delhi regarding response surface design analysis.

- Amrit Paul guided NBPGR Scientist Sharwan Singh to study the classification of Germplasam of carrot.

- Amrit Paul 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.

- Mir Asif Iquebal advised to HK Dixit, Principal Scientist and Murali A, Scientist, IARI, New Delhi regarding experimental designing for whole genome data generation.

- Sarika advised to Chi Ranjit Kaur, Principal Scientist, IARI, New Delhi regarding response surface design analysis.

- Himadri Shekhar Roy provided consultancy to Kishan Lal Kumawat, Scientist (Fruit Science), from Central Institute of Temperate Horticulture for analyzing data on Factorial experiments.

- Ravina Singh Shekhawat Consulted to Neelam Shekhawat, Scientist, Regional Station, Jodhpur, NBPGR, analyzed germplasm of rapeseed and mustard by using PCA.
- Ravina Singh Shekhawat Consulted to Mr. Hanuman Singh, Assistant Professor of AU, Kota, Rajasthan to multiple regression and correlation analysis of Disease Index to different abiotic factor for his PhD thesis
- Rajender Parsad and Sukanta Dash 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 a line x tester experiment (9 lines and 3 testers).
- Arpan Bhowmik advised to Shrila Das, Scientist, ICAR-IARI, New Delhi on the use of Combined Analysis of variance w.r.t. different soil properties over different location. The treatment of interests is different soil depth.
- Pradip Basak provided advisory services to Mr Rajesh Bishnoi, PhD student of the Division of Agricultural Extension, IARI, New Delhi.
- Himadri Shekhar Roy to Varun Hiremath, Ph.D. Research Scholar, IARI, New Delhi for analyzed data on GCV, PCV, heritability, Genetic Gain and Genetic advance.
- Arpan Bhowmik advised to Miss Swarajya Laxmi Nayak, Ph. D Scholar, Division of Food Science and Postharvest Technology, ICAR-IARI, New Delhi on the use of Repeated Measure Anova for studying the significance difference of variety when observations are collected based on various bio-physical properties over four different crop growth stages. There are 9 varieties of citrus crop. Further, similarity analysis among the varieties was also performed based on bio-physical properties for final growth stage using k-means clustering technique.

SOFTWARE DEVELOPED

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

- 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.
- 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.
- 42 maps of various commodities like Agro-climatic regions/zones in India, State-wise percentage distribution of operational holdings, Forest cover in States/UT's in India ,State-wise total number of livestock and poultry, State-wise estimates of production and per capita availability of milk, eggs, meat, wool ,Veterinary Institutions , marine and inland fish production, State-wise area and production of fruit crops, Mango, Banana, Sweet orange, Apple, Papaya, State-wise area and production of vegetables, Potato, Onion, Tomato, State-wise area and production of flowers (loose), major spices ,State-wise area,

production and productivity of plantation crops, aromatics & medicinal Plants, State-wise area of total foodgrains, State-wise production of total foodgrains, State-wise area of Rice, State-wise production of Rice, State-wise area of Wheat, State-wise production of Wheat, State-wise area of Jowar, State-wise production of Jowar, State-wise area of Bajra, State-wise production of Bajra, State-wise area of Maize, State-wise production of Maize, State-wise area of total pulses, State-wise production of total pulses, State-wise area of nine oilseeds, State-wise production of nine oilseeds, State-wise production of Lac in India, State–wise annual sale of tractors were generated and published in ARDB 2019.

- Three drafts of Data book were checked and necessary corrections made.
  U.B. Angadi, MA Iquebal, Sarika and Dinesh Kumar

1. Millets (Pearl Millets, Finger millet, Foxtail millet, Proso Millet Barnyard millet and sorghum) SSR database developed and initiated web resource of millets SSR.
2. Black pepper SNP database initiated
3. Mobile app to "Identify mineral deficiency in crops" has been developed in collaboration with University of Agricultural Sciences, Bangalore

R-Package Developed

– Mandal, B.N., Dash, S. and Parsad, R. (2019). ispd R package. A collection of several functions related to construction and analysis of incomplete split-plot designs. The package contains functions to obtain and analyze incomplete split-plot designs for three kinds of situations namely (i) when blocks are complete with respect to main plot treatments and main plots are incomplete with respect to subplot treatments, (ii) when blocks are incomplete with respect to main plot treatments and main plots are complete with respect to subplot treatments and (iii) when blocks are incomplete with respect to main plot treatments and main plots are incomplete with respect to subplot treatments. The package is available at CRAN: https://cran.r-project.org/web/packages/ispd/index.html.

(i) **Mandal, B.N., Parsad, R. and Dash, S.**

– A web resource on "Incomplete Split-plot Designs: Blocks are complete, main plots are incomplete" on Design Resources Server has been made available at http://s.icar.gov.in/CMIS/CMIS.htm. [Mandal, B.N., Parsad, R. and Dash, S. (2019). Incomplete Split-plot Designs: Blocks are complete, main plots are incomplete: Design Resources Server. ICAR-Indian Agricultural Statistics Research Institute, New Delhi 110 012, India. http://s.icar.gov.in/CMIS/CMIS.htm].

(ii) **Mandal, B.N., Parsad, R. and Dash, S.**

– A web resource on "Incomplete Split-plot Designs: Blocks are complete, main plots are incomplete" on Design Resources Server has been made available at http://s.icar.gov.in/IMCS/IMCS.htm. [Mandal, B.N., Parsad, R. and Dash, S. (2019). Incomplete Split-plot Designs: Blocks are incomplete, main plots are complete: Design Resources Server. ICAR-Indian Agricultural Statistics Research Institute, New Delhi 110 012, India. http://s.icar.gov.in/IMCS/IMCS.htm].

(iii) **Mandal, B.N., Parsad, R. and Dash, S.**

– A web resource on "Incomplete Split-plot Designs: Blocks are incomplete, main plots are incomplete" on Design Resources Server has been made available at http://s.icar.gov.in/IMIS/IMIS.htm. [Mandal, B.N., Parsad, R. and Dash, S. (2019). Incomplete Split-plot Designs: Blocks are incomplete, main plots are complete: Design Resources Server. ICAR-Indian Agricultural Statistics Research Institute, New Delhi 110 012, India. http://s.icar.gov.in/IMIS/IMIS.htm].

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स्वच्छ भारत

एक कदम स्वच्छता की ओर

हर कदम, हर डगर किसानों का हमसफर

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