IASRI NEWS

Volume 17 No. 4 January-March, 2013

From Director's Desk . . .

This newsletter highlights some of the salient research and training achievements made and other significant activities performed during the period under report.

To find a solution to the problem of unavailability of an efficient incomplete block design, the optimization techniques have been developed for construction of incomplete block designs when an efficient incomplete block design is not available for given number of treatments, blocks and block sizes. A multi-step linear integer programming approach to construct a proper binary incomplete block design with specified parameters and concurrence matrix has also been developed. Nearly balanced concurrence matrix is also generated through the algorithm. Such concurrence matrices are known to lead to efficient designs.

There is demand by the administrators and policy planners for reliable estimates of various parameters at the micro level. In this era of decentralization, the thrust of planning process has shifted from macro to micro level. In view of the demands of modern time, the thrust of research efforts has also shifted to development of precise estimators on small area inference using survey weights. The Pseudo empirical best linear unbiased prediction (Pseudo-EBLUP) approach overcomes this limitation by using sample weights and also leads to design consistent small area estimator. The Pseudo empirical best linear unbiased prediction (Pseudo-EBLUP) approach is used to develop design consistent small area estimator.

A web based software for calculating codon usage indices and multivariate analysis for gene expression identification has been developed. It has modules for user profile management, reading or uploading nucleotide sequences, calculation of codon usage indices, and multivariate analysis with graphical output. A link between Java and R statistical package through JRI interface has been developed. This system is accessible any time from arbitrary platforms through internet.

One international training programme on applications of remote sensing and GIS in agricultural surveys sponosored by AARDO; three training programmes under NAIP, one on statistical approaches for genomic data analysis and two on Data Analysis using SAS; four other national training programmes which includes recent advances in designing and analysis of agricultural experiments, development of expert system through AGRIdaksh under CAFT, sponosored by Education Division of ICAR, elementary data analysis, website development and hosting for technical personnel of ICAR and one study visit sponosored by FAO were organised. In all, 154 participants attended these training programmes. One hindi workshop on mail merge and one sensitization workshop under NAIP were also organised.

Scientists of the institute received various awards & recognitions and have published 30 research papers, 03 popular articles, 01 book chapter, 01 project report and 01 reference manual. Besides, 28 research papers were presented in different conferences/ symposia/ workshops, etc.

It is hoped that the contents of this document would be informative and useful to scientists in NARS. Any suggestions for improving the contents of the newsletter further would be highly appreciated.

(UC Sud)

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RESEARCH ACHIEVEMENTS

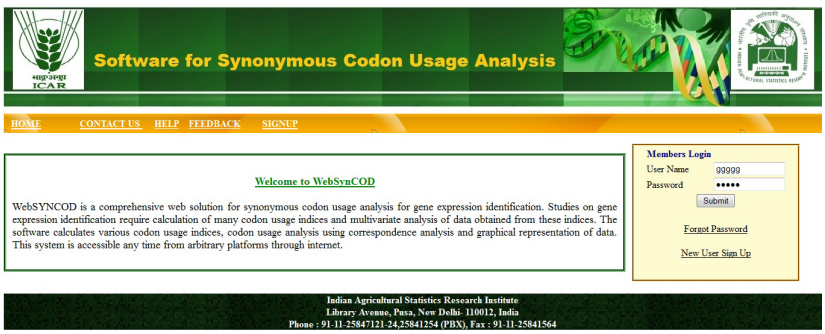
- **Application of optimization techniques for construction of incomplete block designs.** In order to maintain homogeneity among the experimental units within blocks incomplete block designs are very useful. Blocks, with number of experimental units smaller than the total number of treatments in the experiment, help in reducing the intra-block variance leading thereby to precise treatment comparisons. Incomplete block designs have been used in many agricultural experiments. However, the experimenters often face the problem of selecting a suitable design for given number of treatments, *v*, number of blocks, *b* and the common block size, *k*. An efficient incomplete block design may not be always available for given number of treatments, blocks and block sizes. For this purpose, the linear integer programming was used to obtain highly efficient incomplete block designs. A constraint satisfaction approach to construction of incomplete block design with specified concurrence matrix has been proposed. A multi-step linear integer programming approach to construct a proper binary incomplete block design with specified parameters and concurrence matrix has also been developed. Nearly balanced concurrence matrix is also generated through the algorithm. Such concurrence matrices are known to lead to efficient designs. Using the two approaches, construction of different classes of binary incomplete block designs viz. balanced incomplete block designs, regular graph designs, semi-regular graph designs etc. have been illustrated with examples. Modification of the algorithm for obtaining incomplete block designs for tests vs control(s) comparisons has also been shown and illustrated with examples. All the proposed methods have been implemented using R and SAS. An R package called *'ibd'* has been developed and is available on *cran.r-project.org/web/packages/ibd/index.html.* SAS macros have been prepared and are available from the authors. The algorithm is fairly general in nature and can generate an efficient design for given parameters of the design, provided such a design exists. However, for the benefit of the experimenters a catalogue of efficient incomplete block designs in a restricted parametric range $3 \le v \le 20, b \ge v, 2 \le k \le \min(10, v-1)$ with $vb \le 1000$ is prepared. The proposed algorithm has also been utilized to construct balanced treatment incomplete block designs for $2 \le v \le 12, v \le b \le 50, 2 \le k \le v-1$. A list of designs obtained in the above range is also presented. The layouts of the designs are available on Design Resources Server at *http://iasri.res.in/design/ibd/ibd* and *http://iasri.res.in/design/btib/btib.*

- **Small area inference using survey weights.** In this era of decentralization, the thrust of planning process has shifted from macro to micro level. The thrust of research efforts has shifted to development of precise estimators for small areas. Small area estimation (SAE) techniques are used to produce reliable estimates for small areas. As a consequence, SAE is now very common in survey sampling, with several methods proposed in the literature. However, research continues on the identification of SAE techniques that are efficient and also simple to implement, with estimation of mean squared error (MSE) a particular problem. Unit level linear mixed models are often used in SAE, and the empirical

best linear unbiased prediction (EBLUP) based approach is widely used for producing small area estimates under such models and proven to be efficient. However, this approach of SAE does not make use of the unit level survey weights. As a result, small area estimator based on this approach is not design consistent unless the sampling design is self-weighting within areas. The Pseudo empirical best linear unbiased prediction (Pseudo-EBLUP) approach overcomes this limitation by using sample weights and also leads to design consistent small area estimator.

A bias-robust method for estimating the MSE of Pseudo-EBLUP estimator that remain approximately unbiased under failure of assumptions about second order moments has been developed. The proposed estimator is based on conditional approach of MSE estimation and provides area specific MSE estimates for the Pseudo-EBLUP. In addition, the conditional approach of MSE estimation leads to estimator of MSE that is simpler to implement, and potentially more robust. In particular, it performed reasonably well overall in terms of estimating true MSE for the Pseudo-EBLUP.

- **Web based software for gene expression analysis using synonymous codon usage.** The patterns of codon usage vary considerably among organisms and also among genes from the same genome. Synonymous codons encode the same amino acid and usually differ by one nucleotide in the third codon position and are used at different frequencies both within and between organisms. This phenomenon is known as codon bias.



Different factors contribute to codon usage bias like gene expression level, %G+C composition, GC skew, transcriptional selection. These factors form a pattern called synonymous codon usage pattern that explains the causes of variation present in the genes. Analysis of codon usage patterns provide a basis for understanding the mechanism of biased usage of synonymous codons and selecting appropriate host expression systems to improve the expression of target genes in vivo and in vitro. In addition, codon usage profiles may be used to improve the accuracy of gene prediction from genomic sequences as well as protein functional classification.

Complete analysis of codon usage for gene expression studies requires output from many software and use of standard statistical packages for visual representation of data. Some of the packages for codon usage analysis are stand alone and thus are not easily accessible. Accordingly, a web based solution for calculating codon usage indices and multivariate analysis for gene expression identification has been developed. The software has been developed using JSP, Java, HTML and CSS. The software has main modules for user profile management, reading or uploading nucleotide sequences, calculation of codon usage indices, and multivariate analysis with graphical output. It also has links for contact the authors, feedback, on-line help and downloading sample data. A separate class has been developed in Java which contain methods for calculation of important codon usage indices. A link has been developed between Java and R statistical package through JRI. This system is accessible any time from arbitrary platforms through internet. This study aims at helping researchers in using synonymous codon usage analysis for gene expression identification.

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HUMAN RESOURCE DEVELOPMENT

Training Programmes/ Workshop Organised

S.No.	Title	Venue	Date	Sponsored by	No. of Participants
1.	Training programme on Statistical Approaches for Genomic Data Analysis Course Director: Seema Jaggi Course Co-Director: Sarika	IASRI, New Delhi	07-19 January 2013	NAIP	19
2.	Training Programme on Recent Advances in Designing and Analysis of Agricultural Experiments under CAFT Course Director: Krishan Lal Course Co-Directors: Anil Kumar Eldho Varghese	IASRI, New Delhi	08-28 January 2013	Education Division, ICAR	22
3.	An International training programme on Applications of Remote Sensing and GIS in Agricultural Surveys Course Director: Prachi Misra Sahoo Course Co-ordinator: Tauqueer Ahmad	IASRI, New Delhi	24 January to 13 February 2013	AARDO	06
4.	Study tour on Agricultural Statistics System and Food Security Policy Analysis in India Course Director: UC Sud Course Co-ordinator: Tauqueer Ahmad	IASRI, New Delhi	04 - 08 February 2013	FAO	06
5.	Training programme on Development of Expert System through AGRIdaksh under CAFT Course Director: Sudeep Course Co-Directors: Alka Arora Pal Singh	IASRI, New Delhi	14 February to 06 March 2013	Education Division, ICAR	17
6.	Training programme on Data Analysis using SAS Course Director: Rajender Parsad Course Co-ordinators: Seema Jaggi VB Singh (RVSKVV, Gwalior)	RVSKVV, Gwalior	18-23 February 2013	NAIP	21
7.	Training programme on Data Analysis using SAS Course Director: Ramasubramanaian V. Course Co-ordinators: Samir Farooqui Rajesh Sharma and Vipin Ladha (SKRAU, Bikaner)	SKRAU, Bikaner	04-09 March 2013	NAIP	23
8.	मेल–मर्ज (हिन्दी कार्यशाला) संयोजक: नरेश चँद पन्ना लाल गुप्ता	भा.कृ.सां.अ.स.,	07 मार्च 2013 नई दिल्ली	भा.कृ.सां.अ.स., नई दिल्ली	19
9.	Training Programme on Elementary Data Analysis for Technical Personnel of ICAR Course Director: Cini Varghese Course Co-Director: Susheel Kumar Sarkar	IASRI, New Delhi	11-15 March 2013	ICAR	20
10.	Sensitization Workshop under SSC NARS Convener: Amrit Kumar Paul	SBPU&AT, Modipuram, Meerut	13-14 March 2013	NAIP	64
11.	Training Programme on Website Development and Hosting for Technical Personnel of ICAR Course Director: Pal Singh Course Co-Director: Sudeep	IASRI, New Delhi	18-22 March 2013	ICAR	20

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AWARDS AND RECOGNITIONS

Dr. UC Sud

- Invited speaker in the 15th Annual Conference of Society of Statistics, Computer and Applications, Banasthali, Rajasthan, during 24-26 February 2013.
- Expert member of Core Group, Committee constituted for Suggesting the Statistical methodology to generate data on Student Enrolment, Ministry of Human Resources Development, Government of India.
- Organized a session on Recent Advances in Sample Surveys during the International Conference on Statistics, Science, and Society: New Challenges and Opportunities (IISA 2013), organized by International Indian Statistical Association, Chennai, India during 02-05,January 2013.

Dr. Rajender Parsad

- Chaired a session of Invited Papers during 15th Annual Conference on Statistics and Informatics in Agricultural Research of Society of Statistics, Computer and Applications organized at Banasthali Vidyapith, Banasthali during 24-26 February 2013.
- Organised a symposium on Statistics in the Welfare of Society as Convener during 15th Annual Conference of Society of Statistics, Computer and Applications held at Banasathali Vidyapith during 24-26 February 2013.
- Nominated as member, Institute Management Committee of National Bureau of Plant Genetic Resources, New Delhi for the period of three years with effect from 21.02.2013.

Dr. Anil Rai

- Nominated as member of RAC of Project Directorate on Animal Disease Monitoring and Surveillance (PD-ADMAS), Bangalore.

Dr. LM Bhar

- Chaired a session of Contributed Papers during 15th Annual Conference on Statistics and Informatics in Agricultural Research of Society of Statistics, Computer and Applications organized at Banasthali Vidyapith, Banasthali, Rajasthan during 24-26 February 2013.

Dr Hukum Chandra

- Expert Member, Central Board of Secondary Education (CBSE) Committee on finalization of modalities for normalization of JEE (Main), 2013, Government of India.
- Convened the session on Sample and Census and Chaired a session on Recent Advances in Sample Surveys during International Conference on Statistics, Science, and Society: New Challenges and Opportunities (IISA 2013), organized by International Indian Statistical Association, Chennai, India during 02-05,January 2013.
- Chaired a session of Contributed Papers during 15th Annual Conference on Statistics and Informatics in Agricultural Research of Society of Statistics, Computer and Applications organized at Banasthali Vidyapith, Banasthali, Rajasthan during 24-26 February 2013.
- As a Jury member evaluated poster presentations in different poster sessions, in the 15th Annual Conference of Society of Statistics, Computer and Applications, Banasthali, Rajasthan, during 24-26 February 2013.

- Expert member of Core Group, Committee constituted for Suggesting the Statistical methodology to generate data on Student Enrolment, Ministry of Human Resources Development, Government of India.

Dr. Anil Kumar

- Received Smt. Kadambini Devi Award-2013 on research paper "Vocal tract resonances as indexical cues in Karan Fries cows" by The Indian Society of Animal Production and Management in the national seminar & XX annual convention held at NDRI, Karnal during 28-30 January, 2013.
- Bhadauria, Pragya, Lathwal, SS, Jadoun, YS, Prasad, Shiv and Kumar, Anil. Influence of Zinc-biotin supplementation on lameness in KF cows during periparturient period. Paper awarded Best Poster (IInd Prize) by the Indian Society of Animal Production and Management in the National Seminar & XX Annual Convention held at NDRI, Karnal during 28-30 January, 2013.
- Acted as a rapporteur in technical session on Climate Change in national seminar on New paradigms in livestock production: from traditional to commercial farming and beyond on January 29, 2013 at National Dairy Research Institute, Karnal

PANORAMA OF ACTIVITIES

- Workshops on System Demonstration to Core group members in different functional areas of MIS/ FMS project at IASRI, New Delhi from January 02-17, 2013.
- A brain-storming session was organized under the chairmanship of Prof. Prem Narain, Chairman, RAC to discuss the draft Results Framework Document (RFD) 2013-14 of the Institute on January 04, 2013. Dr BBPS Goel, Dr SK Raheja, Dr OP Kathuria and Dr SD Sharma, Former Directors, Dr VK Bhatia, Director, Dr UC Sud, Nodal Officer, Dr KK Tyagi, Co-Nodal Officer, Head of Divisions, Incharge PME Cell, CAO, AF&AO and members of RFD Cell participated in the session. Dr RK Tomar, RFD Coordinator, ICAR explained the purpose of RFD and provided detailed steps in preparation of RFD 2013-14. Dr KK Tyagi presented draft RFD 2013-14 of the Institute. Changes in draft RFD 2013-14 were made as per suggestions.
- 14th meeting of the Research Advisory Committee of IASRI was organized on 30 January 2013 under the Chairmanship of Dr. Prem Narain, Former Director, IASRI, New Delhi. The meeting was attended by Dr. SD Sharma, Former Director, IASRI, New Delhi and Vice-Chancellor, Dev Sanskriti Vishwavidalaya, Haridwar, Dr. VK Bhatia, Director IASRI, Dr. GM Boopathy, Deputy Director General, National Accounts Division, Central Statistical Organization, New Delhi, Dr. Sridhar Sivasubbu, Institute of Genomics and Interactive Biology, New Delhi, Dr. NPS Sirohi, ADG (Engg.), ICAR as members of RAC of the Institute and Dr. Rajender Parsad, Head, Division of Design of Experiments as member secretary RAC. Dr. VK Gupta, National Professor, ICAR, all Heads of Divisions, all Professors and Incharge, PME Cell of IASRI also attended the meeting as special invitees.
- 61st Meeting of the Institute Management Committee was organised on 22 February 2013 under the Chairmanship of Dr. VK Bhatia, Director, IASRI. The meeting was attended by Dr. NPS Sirohi, ADG(Engg.), ICAR, Dr. (Mrs.) Ravinder Kaur, Project Director, Water Technology Centre, IARI, Dr. Niranjan Prasad, Head, Division of Processing and Production Development, IINRG, Ranchi, Dr. (Mrs.) Rajni Jain, Principal Scientist, NCAP as members of IMC and Sh. KPS Gautam, Head of Office as member secretary of IMC. Dr. VK Gupta, National Professor, ICAR, all Heads of Divisions, all Professors, Incharge, PME Cell of IASRI and Sr. F&AO also attended the meeting as special invitees.

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- 77th meeting of the Institute Research Committee (IRC) was held during 25-26 March and 01-02 April 2013 under the Chairmanship of Dr. UC Sud, Director (A), IASRI. 06 new research projects (04 Institute funded and 02 outside funded) were approved and progress of 56 (28 Institute funded, 15 in collaboration with other Institutes and 13 outside funded) ongoing research projects were discussed and 07 research projects were declared as complete during the meeting.

Seminars Delivered

Seminars on different areas of Agricultural Statistics, Computer Application and Bioinformatics were delivered. These seminars include presentation of salient findings of the completed research projects by the scientists, Thesis/ORW/Course seminars of students of M.Sc. and Ph.D. (Agricultural Statistics), M.Sc. (Computer Application) and M.Sc. (Bioinformatics) and Guest seminars.

The Details of Seminars Delivered

Category	Type of seminar	Number
Scientist	Project Completed	06
	New Proposal	03
Student	Course	16
	ORW	02
	Thesis	03
Guest		03
Others	RFD	01
Total		**34**

During the period seminars were delivered by three guest speakers i) Prof. Balgobin Nandram, Department of Mathematics and Statistics, Concordia University, Montreal, Canada on Assessing correlations in a bayesian analysis of a small area finite population proportion, ii) Prof. Yogendra P. Chaubey, Department of Mathematics and Statistics, Concordia University, Montreal, Canada on Symmetrising and variance stabilizing transformations and iii) Prof. RS Chhikara, School of Natural and Applied Sciences, University of Houston – Clear Lake, Texas, USA on Modelling repeated observations of blood volume in muscle microcirculation.

PUBLICATIONS

Research Papers

- Ahuja, S and Dhanya, C (2012). Regionalization of rainfall using RCDA cluster ensemble algorithm in India. *J.Software Engg. Appl.*, **5(8)**, 568-573.
- Ahuja, S (2012). Regionalization of river basins using cluster ensemble. *J. Water Reso. Prot.,* **4**, 560-566.
- Arora, Sumitra, Kanojia, Ashok K, Kumar, Ashok, Sardana, HR and Sarkar, Susheel Kumar (2012). Impact of biopesticide formulation on tomato (Lycopersicon esculemtum): economics and environmental effects. *Ind. J. Agril. Sci*, **82(12),** 1075-1078.
- Bhati, Jyotika, Chaduvula, Pavan K, Kumar, Sanjeev and Rai, Anil (2013). Phylogenetic analysis and secondary structure prediction for drought tolerant Capbinding proteins of plant species. *Ind. J. Agril. Sci.,* **83(1)**, 21–25.
- Chatterjee, Niladri Sekhar, Gupta, Suman and Varghese, Eldho (2013). Degradation of metaflumizone in soil: Impact of varying moisture, light, temperature, atmospheric CO_2 level, soil type and soil sterilization. *Chemosphere*, **90(2),** 729–736.
- Chaudhary, Vidhi, Prasanna, Radha, Nain, Lata, Dubey, SC, Gupta, Vishal, Singh, Rajendra, Jaggi, Seema and Bhatnagar, Ashok Kumar (2012). Bioefficacy of novel cyanobacteria-amended formulations in suppressing damping off disease in tomato seedlings. *World J. Microbiology and Biotechnology*. **28(12)**, 3301-3310.

- Choudhary, VK, Kumar, P Suresh, Sarkar, Susheel Kumar and Yadav, JS (2013). Production potential, economic analysis and energy auditing for maize- vegetable based cropping systems in Eastern Himalayan Region, Arunachal Pradesh. *Ind. J. Agril. Sci*, **83(1)**, 110-115.
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- Dalamu, TK Behera, Varghese, Cini and Khan, Swati (2012). Genetic variability and character association analysis in bitter gourd (Momordica charantia L.). *Pusa AgriScience*, **35**, 20-25.
- Jaggi, Seema, Gill, AS, Varghese, Cini, Sharma, VK and Singh, NP (2012). Modelling the gram (Cicer Arietinum) yield under agroforestry system. *J. Non-Timber Forest Products*, **19(4)**, 275-278.
- Jeeva, JC, Ramasubramanian, V, Kumar, A, Bhatia, VK, Geethalakshmi, V, Premi, SK and Ramasundaram, P (2013). Forecasting technological needs and prioritizing factors for the post-harvest sector of Indian fisheries. *Fishery Technology*, **50**, 87- 91.
- Karak, T, Bhattacharyya, P, Das, T, Paul, RK and Bezbaruah, R (2013). Non-segregated municipal solid waste in an open dumping ground: A potential contaminant vis-a-vis environmental health. *Int. J. Env. Sci. Technol.*, **10(3)**, 503-518.
- Kaur, Charanjit, Walia, Suresh, Nagal, Shweta, Walia, Shweta, Singh, Jashbir, Singh, Braj Bhushan, Saha, Supradeep, Singh, Balraj, Kalia, Pritam, Jaggi, Seema and Sarika (2013). Functional quality and antioxidant composition of selected tomato (solanum lycopersicon l) cultivars grown in northern India. *LWT - Food Science and Technology*, **50**, 139-145.
- Kumar, Amrender (2013). Forewarning models for alternaria blight in mustard (*Brassica juncea*) crop. *Ind. J. Agric. Sci.,* **81(1),** 116-119.
- Kumar, Anil, Kumar, Rajendra and Choudhary, Vipin Kumar (2012). Estimation and nutrient response ratio of various cropping systems under All India Coordinated Research Project on Integrated Farming Systems. *Int. J. Agril Statist. Sci.,* **8(2)**, 645-649.
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- Sanjukta, RK, Farooqi, S, Sharma, N, Rai, N, Mishra, DC, Rai, A, Singh, DP and Chaturvedi, KK (2013), Statistical analysis of codon usage in extremely halophilic bacterium, Salinibacter ruber DSM 13855, *Online J Bioinform.*, **14(1),**15-31.

- Sarika, Arora, Vasu, Iquebal, MA, Rai, Anil and Kumar, Dinesh (2012). *In silico* mining of putative microsatellite markers from whole genome sequence of water buffalo (*Bubalus bubalis*) and development of first BuffSatDB. *BMC Genomics,* **14(43)**, 1-8**.** (http://www.biomedcentral.com/1471-2164/14/43/abstract).
- Sarkar, RK, Rao, AR, Wahi, SD and Bhat, KV (2012). Performance of clustering procedures for grouping germplasms based on mixture data with missing observations. *Ind. J. Agril. Sci.*, **82(12)**, 1055-1058.
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- Varghese, Cini, Jaggi, Seema and Dwivedi, Lokesh (2013). Designs involving varying temporal environments under factorial treatment structure. *Int. J. Ecological Eco.*, **28**(1), 130-135.
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Popular Articles

- Chaturvedi, KK, Singh, VB and Khatri SK. A study of bug prediction using Mozilla project. *Proceedings of International Conference on Reliability, Infocom Technologies and Optimization (ICRITO 2013) during January 29-31, 2013 held at Amity University, Noida, UP (India).* Pg. 350-357. ISBN: 978-93-81583-85-2.
- Dahiya, Shashi and Yadav, Ruchi. Web based System for Crop Disease Identification. *Proceedings of the 7th National Conference on Computing For Nation Development – INDIACom-2013,* ISSN 0973-7529, ISBN 978-93-80544-06-9, 287-288, 294.
- Sharma, Meera, Chaturvedi, KK and Singh, VB. Severity prediction of bug reports in cross project context. *Proceedings of International Conference on Reliability, Infocom Technologies and Optimization (ICRITO 2013) during 29-31 Jan. 2013 held at Amity University, Noida, UP (India).* Pg. 96-102. ISBN: 978-93-81583-85-2.

Project Report

- Varghese, Cini and Jaggi, Seema (2012). Experimental Designs for Agricultural Research Involving Sequences of Treatments. Project Report IASRI, New Delhi. IASRI/PR-09/2012.

Book Chapter

- Farooqi, Samir, Bharadwaj, Anshu, Chaturvedi, KK and Islam, SN (2012). Introduction to SAS enterprise miner, Data Mining Techniques for Farm Animal Management, Eds. AP Ruhil, TK Mohanty, and SS Lathwal. *AgroTech Publishing Academy, Udaipur.* 330-345.

Reference Manual

- Statistical Approaches for Genomic Data Analysis. (2013, Eds. Seema Jaggi and Sarika)
- Elementary Data Analysis. (2013, Eds. Cini Varghese and Susheel Kumar Sarkar).
- Recent Advances in Designing and Analysis of Agricultural Experiments. (2013, Eds. Krishan Lal, Anil Kumar and Eldho Varghese).

E-Manual

- Statistical Approaches for Genomic Data Analysis. (2013, Eds. Seema Jaggi and Sarika)
- Recent Advances in Designing and Analysis of Agricultural Experiments. (2013, Eds. Krishan Lal, Anil Kumar and Eldho Varghese).

INVITED LECTURES DELIVERED

- Workshop on GIS for Health Statistics at The Energy and Resources Institute (TERI), New Delhi on 04 January 2013.
  - Sahoo, Prachi Misra. (i) Statistical techniques for spatial data analysis, ii) Spatial sampling and iii) Spatial regression analysis . (3 lectures)
- Training on Data Processing and Analysis organized at Council for Social Development, New Delhi during 07-12 January 2013.
  - Ramasubramanian, V. Correlations, practical on correlations using SPSS, regression: univariate and multivariate and practical on regression using SPSS on 10 January 2013.
  - Rao, AR i) PCA, ii) Factor analysis and iii) Practicals on PCA & FA using SPSS. (3 lectures)
  - Varghese, Cini. i) Tests of significance, ii) Practical on tests of significance and iii) Non-parametric tests and Practical on non-parametric tests. (3 lectures)
- Training on Data Analysis Using SAS from 14-20 January 2013 at MPUAT, Udaipur.
  - Ramasubramanian, V. i) Simple and multiple linear regression modeling, diagnostics & remedial measures, ii) Forecasting using weather indices based regression models, iii) Fitting non-linear models – Gompertz, Logistic and monomolecular, iv) Time series analysis and modelling - Exponential smoothing, ARIMA, Intervention and ARCH/GARCH models, v) Logistic regression and logit models and vi) Markov chain modeling for crop forecasting (6 lectures)
- 10th Symposium of Biotechnological Approach for Plant Protection: Constraints and Opportunities at Goa during 27-29 January 2013.
  - Islam, SN. Expert System: An IT based approach in IPM
- Training on Biometrical Analysis Using SAS organized by the Nodal Officer under the NAIP Consortium Strengthening Statistical Computing for NARS at IGKV, Raipur during 23 January - 01 February 2013)
  - Parsad, Rajender. Design resources server and Indian NARS statistical portal. (2 lectures)
  - Paul, AK. i) SAS for biometrical analysis, ii) SAS for inbreeding analysis, iii) Diallel analysis using SAS and iv) SAS macros for biometrical study. (4 lectures)

- Training on Data Analysis using SAS organized by IASRI under NAIP Consortium Strengthening Statistical Computing for NARS at Rajmata Vijayaraja Scindia Krishi Vishwa Vidyalaya (RVSKVV), Gwalior during 18-23 February 2013.
  - Parsad, Rajender. i) SAS: An overview; ii) Tests of significance using SAS; iii) Correlation and regression analysis using SAS; (iv) Analysis of experimental data using SAS; (v) Design resources server; vi) Indian NARS statistical computing portal vii); Mixed models using SAS viii) Multivariate analysis using SAS and ix) Diagnostics and remedial measures (9 lectures)
  - Jaggi, Seema. SAS enterprise guide for analysis of experimental data (2 lectures)
  - Bhar, LM. i) Regression diagnostics and remedial measures, ii) Non-linear models, iii) Probit analysis and Analysis of experimental data (3 lectures)
  - Paul, AK- i) Application of SAS for breeding data analysis, ii) Diallel analysis using SAS and iii) Running of genetics SAS macro. (3 lectures)
  - Ramasubramanian, V - i) Time series analysis using SAS (Exponential smoothing, ARIMA, etc.), ii) Hands on time series analysis, iii) Fitting non-linear models using SAS, iv) Multidimensional scaling using SAS and v) Forecasting using weather indices based regression models through SAS (5 lectures)
- Training on Data Analysis for Water Management Research using SAS under the NAIP Consortium Strengthening Statistical Computing for NARS at DWM, Bhubaneswar on 18-23 February 2013.
  - Lal, Krishan - Design resources server, CRD, RCBD, LSD, BIB designs, Factorial experiments including confounding, Split and Strip plot design, Combined analysis of data. (8 lectures)
- Training on Survey Design and Data Analysis using SAS in Social Sciences at NAARM, Hyderabad held during 28 January – 06 February 2013.
  - Ramasubramanian V. i) Cluster analysis, ii) Canonical correlation and Multi-dimensional scaling. (3 lectures)
- Training on SAS for Data Reduction and Multivariate Analysis at CIFE, Mumbai held during 11-16 February 2013.
  - Ramasubramanian V. i) Multi-dimensional scaling and ii) Logistic regression for classification and prediction. (2 lectures)
- Training on Bioinformatics for Conservation and Improvement of Animal Genetic Resources from 18-28 February 2013 at NBAGR Karnal.
  - Rai, Anil. Genotype imputation.
- Sensitization programme on Statistical Computing for NARS organized by IISR, Lucknow on 28 March 2013.
  - Rajender Parsad. i) Strengthening Statistical Computing for NARS, ii) Genesis, achievements and impact; Indian NARS Statistical Computing Portal; Design Resouces Server and iii) SAS: A brief overview. (3 lectures)
- National workshop on Foresight and Future Pathways of Agricultural Research through youth in India held at NAS Complex, New Delhi during 01-02 March, 2013.
  - Ramasubramanian V. Technology forecasting techniques with applications in agriculture: Retrospect and prospects.

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- Training on Data Analysis Using SAS at ICAR Research Complex for NEH Region, Umiam, Meghalaya during 11-20 March 2013.
  - Eldho Varghese. (i) Basic Principles of DOE, (ii) Overview of Basic Designs, (iii) Contrast Analysis, (iv) Multiple Comparison Procedures, (v) BIB Designs and PBIB Designs, (vi) Analysis of Covariance, (vii) Row-column Designs, (viii) Factorial Experiments, (ix) Split and Strip Plot Designs, (x) Practical Exercise on Split and Strip Plot Designs, (xi) Resolvable Designs, (xii) Response Surface Designs and (xiii) Analysis of Groups of experiments. (13 lectures)

PAPERS PRESENTED

- **100th Indian Science Congress organized at Calcutta University, Kolkata during 03-07 January, 2013.**
  - Datta, Anindita, Jaggi, Seema, Varghese, Cini* and Varghese, Eldho. Structurally incomplete row-column designs with multiple units per cell.
  - Ghosh, H* and Prajneshu. Genetic algorithm for fitting SETARMA nonlinear time series modelling and development of out-of-sample forecasts.
  - Murali, S, Sahu, TK, Jahageerder, S, Behra, BK and Rao, AR*. In silico characterization of splice sites of zebra fish.
  - Paul, AK*, Das, S and Wahi, SD. Comparative performance of different imputation techniques against missing observations for different classification procedures.
  - Rao, AR*, Dash, M, Behra, BK and Sharma, AP. Statistical and computational approaches in animal and fish genomics.
  - Singh, N, Rao, AR* and Thelma, BK. Identification of genome wide SNPs associated with ulcerative colitis using machine learning approaches.
  - Varghese, Cini* and Kumar, Arvind. Row-column designs for investigational products vs. control comparisons in veterinary trials.
  - Varghese, Eldho*. MERC designs for diallel cross experiments with specific combining abilities [Paper presented in the Young Scientist Award programme in the section of mathematical Sciences (Including Statistics)]
- **International Conference on Statistics, Science, and Society: New Challenges and Opportunities (IISA 2013), organized by International Indian Statistical Association, Chennai, India, 02-05 January 2013.**
  - Chandra, H, Chambers, R, Salvati, N and Sud, UC (2013). Spatial Nonstationarity in small area estimation. (invited talk).
- **International Conference on Recent Advances in Mathematical Statistics and Its Applications in Applied Sciences organized at Guwahati University, Assam during 31 December 2012 - 02 January 2013**
  - Ghosh, H. An improved fuzzy time series method of forecasting.
  - Paul, RK. Modelling and forecasting of Indian monsoon rainfall by wavelet methodology.
- **International Conference on Reliability, Infocom Technologies and Optimization (ICRITO 2013) during 29-31 January 2013 at Amity University, Noida, UP (India).**
  - Chaturvedi, KK*, Singh, VB and Khatri, SK. A study of bug prediction using Mozilla.

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- **International Symposium on Genomics in Aquaculture during 22-23 January 2013 at Central Institute of Freshwater Aquaculture, Bhubaneshwar.**
  - Iquebal, MA, Sarika and Kumar, Dinesh*. Next generation sequencing and its challenges. (lead lecture)
- **15th Annual Conference on Statistics and Informatics in Agricultural Research of Society of Statistics, Computer and Applications organized at Banasthali Vidyapith, Banasthali during 24-26 February 2013**
  - Chandra, H*, Gharde, Y and Jain, VK (2013). Small area estimation using estimated population level auxliary data. (invited talk).
  - Dasgupta, Pratyush, Bhar, Lalmohan* and Gupta, VK- Robustness of BIB designs for multi-response experiments against the loss of observations. (invited talk)
  - Dash, Sukant. Efficient block designs for mixed level factorial micro-array experiments based on baseline parameterization.
  - Parsad, Rajender* and Gupta, VK. Agricultural statistics in the welfare of the society. (invited talk).
  - Paul, RK*. Determination of trend in rainfall for different agro-climatic zones in India using wavelet techniques.
  - Sadhu, Sandip Kumar and V, Ramasubramanian*. Decision tree based models for classification in agricultural ergonomics.
  - Sarkar, Susheel Kumar*, Lal, Krishan and Gupta, VK. Construction of cost efficient multi-level factorial experiments.
  - Sud, UC*, Chandra, H and Gupta, VK (2013). Calibration approach based regression type estimator for inverse relationship between study and auxiliary variable. (invited talk).
  - Varghese, Cini*, Jaggi, Seema and Varghese, Eldho. A series of neighbour balanced polycross designs.
- **International Conference on Bio-resource and Stress Management during 06-09 February 2013 organized at Science City, Kolkata.**
  - Mishra, Dwijesh. Identification of co-regulated genes of chick-pea under abiotic stress.
- **International Workshop on Data Analytics and Applications organized by Goa Campus of BITS Pilani during 26 February - 01 March 2013**
  - Rai, Anil. Agricultural bioinformatics and computational biology.(invited talk)
- **7th National Conference on Computing For Nation Development – INDIACom organized by Bharti Vidyapeeth's Institute of Computer Applications and Management, New Delhi during 07 – 08 March 2013.**
  - Dahiya, Shashi* and Yadav, Ruchi. Web based system for crop disease identification.
- **National Symposium on Biotechnology: Present status & future prospects held at Deen Bandhu Chhoturam University of Science & Technology (Haryana State Government University) on 16 March 2013.**
  - Kumar, Dinesh. NGS data analysis and its challenges (invited lead paper)

- **National Seminar on Applied Statistics on 22 March 2013 at Bayesian and Interdisciplinary Research Unit, ISI Kolkata**
  - Parsad, Rajender* and Gupta, VK. Application of designs for factorial experiments in National Agricultural Research System. (invited talk)
- **NAIP Component-I workshop organized by NAARM Hyderabad during 22-23 March 2013.**
  - Rai, Anil. Establishment of National Agricultural Bioinformatics Grid in ICAR

PARTICIPATION

Conferences / Workshops / Seminars / Symposia etc.

- National Workshop on Museum Evaluation & Visitor Research organized by National Science Centre, Delhi during 17-19 January, 2013 (Dr. Susheela Kaul)
- Technical Session of Brainstorming Workshop on Methodologies to Assess Impact of Capacity Building under NAIP jointly organized by International Food Policy Research Institute and NAIP on 21 February 2013 at NASC Complex, Pusa, New Delhi (Dr. AR Rao also acted as a Panelist in the Technical session-II on Experience sharing on impact of capacity building)
- Workshop on the discussion on the Cost of Cultivation Study at Management Study Centre, Harish Chandra Mathur, Regional Public Administration Institute (HRM RIPA), Jawahar Lal Nehru Marg, Jaipur (Rajasthan) on 26 February 2013. (Dr. UC Sud)
- International Workshop on Data Analytics and Applications organized by Goa Campus of BITS Pilani during 26 February - 01 March 2013. (Sh. SB Lal)
- Workshop on Information Technology in agriculture and Food-A strategy formulation meeting during 15-16 March 2013 at NASC Complex, New Delhi. (Dr. Anil Rai)

Trainings

- Professional attachment training under Dr RN Sahoo, Senior Scientist, Division of Agricultural Physics, IARI, New Delhi as a part of 96th FOCARS training during 01 January - 31 March 2013 (Sh Ankur Biswas)
- Professional attachment training under Prof. Aloke Dey at Indian Statistical Institute (Delhi Centre) as a part of 96th FOCARS training during 01 January - 31 March 2013 (Sh. Arpan Bhowmik)
- Training on Statistical Approaches for Genomic Data Analysis during 07-19 January 2013 at IASRI. (Md. Samir Farooqi)
- Training on Hyper spectral Remote Sensing for Agriculture (HYPERAGRI-2013) sponsored by Department of Science and Technology (DST), Govt. of India in the Division of Agricultural Physics, IARI, New Delhi during 18-27 February 2013. (Sh Ankur Biswas).
- Training on Hyperspectral Remote Sensing and Applications in Water Resources during 18-23 March 2013 in Agricultural and Food Engineering Department, Indian Institute of Technology, Kharagpur (Dr Prachi Misra Sahoo)

Meetings

- A meeting of the Directors and Nodal Officers of the Agricultural Engineering Division under the chairmanship of Dr. MM Pandey, DDG (Engg.) was held at IASRI, New Delhi to discuss the draft RFD 2013-14 of each Institute on 11 January 2013. Dr NPS Sirohi was also present in the meeting. From the Institute, Dr VK Bhatia, Director, Dr UC Sud, Nodal Officer and Dr KK Tyagi Co-Nodal Officer along with the Directors and Nodal Officers of other Institutes of the Ag. Engg. Division attended the meeting. Dr VK Bhatia, Director of the Institute presented the draft RFD 2013-14 of the Institute.

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- Review meeting on Pests dynamics in relation to Climate Change under NICRA on 18 January 2013 at NCIPM, New Delhi. (Dr. Amrender Kumar)
- Meeting related to ICT in Agriculture as member of team from ICAR under the Chairmanship of DG, ICAR in Planning Commission of India and ICAR, New Delhi on 01 and 15 February 2013 respectively. (Dr. Anil Rai)
- BOS meeting on 06 February and 26 March 2013 at Division of Agricultural Economics, Indian Agricultural Research Institute, New Delhi. (Dr. DR Singh)
- First meeting of the committee constituted for suggesting the statistical methodology to generate data on Student Enrolment, Ministry of Human Resources Development, Govt. of India, at Shatri Bhawan, New Delhi on 13 February 2013. (Dr UC Sud and Dr Hukum Chandra)
- Meeting of committee for Updation of Rates & Ratios Used in the Compilation of National Accounts Statistics at CSO, Sardar Patel Bhawan, New Delhi on 14 February 2013. (Dr KK Tyagi)
- Meeting for Clearance of Probation and Confirmation of Scientists at NCAP on 22 February 2013 at NCAP(Dr. DR Singh)
- ICAR Senior Officer Meeting on 07 March 2013 at ICAR, Krishi Bhawan, New Delhi. (Dr. UC Sud)
- Meeting of Committee for Updating of Rates and Ratios for compilation of estimates of Domestic Product, Capital Formation and other aggregates of NAS on 11 March 2013 at Ministry of Statistics and Programme Implementation, Sardar Patel Bhawan, New Delhi. (Dr. UC Sud)
- NAIP-NABG 12th Plan Animal Science Meeting on 12 March 2013 at NBAGR, Karnal. (Dr. Dinesh Kumar)
- Meeting of Directors and Head of Division of ICAR (Ag. Engg.) held at Krishi Bhavan on 14 March 2013 under the Chairmanship of DG, ICAR, New Delhi.
- Board of Studies meeting on 15 March 2013 held at Department of Biotechnology, UIET, KUK, Kurukshetra (Dr. Dinesh Kumar)
- The Strategy Formulation Meeting (SFM) of Information Technology in Agriculture and Food at NASC Complex on March 15-16. (Dr. Sudeep)
- Meeting with DG, ICAR for development of proposal for National Centre of ICT in Agriculture under the Chairmanship of Sh. T. Nanadakumar on 18 March 2013. (Dr. Anil Rai and Dr. AK Choubey)
- Annual review committee of FASAL programme held at ANGRAU Hyderabad during 18-19 March 2013 (Dr. Ranjana Agrawal)
- Director's Conference preceded by an interactive session by Shri. N.R. Narayan Murthy, Chairman Emeritus, Infosys and presented a presentation on Half Yearly Progress Report (HYPM) during 19-20 March 2013 at NASC Complex, New Delhi (Dr. UC Sud)
- Meeting with empowered committee of National Fund for Basic, Strategic and Frontier Application Research in Agriculture (NFBSFARA) held at National Agricultural Science Complex (NASC) on 21 March, 2013.(Dr. Anil Rai, Sh. Sanjeev Kumar and Dr. DC Mishra)
- Review Meeting of NAIP, Component-I at NAARM, Hyderabad during 22-23 March 2013 (Dr. AK Choubey and Dr. Alka Arora)

- Meeting with Dr. Sam Pitroda on development of proposal for National Centre of ICT in Agriculture on 25 March 2013 in Planning Commission. (Dr. Anil Rai and Dr. AK Choubey)
- Meeting, to explore the use of SATMET products for value addition to the existing national agro-advisory service for disease-pest forewarning jointly with IMD (Agrimet), Pune and Space Application Centre (SAC) Ahmedabad on 25 March 2013 at IMD, Pune (Dr. Amrender Kumar)

CONSULTANCY /ADVISORY SERVICES PROVIDED

- Dr. Rajender Parsad advised Sh. Rajeev Dhiman from Department of Crop Improvement, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur on the analysis of data of an experiment conducted using an alpha design for 64 genotypes in 3 replications. Each replication having 8 blocks of size 8 each. The experiment was conducted during 2010 and 2011. He was advised on performing Analysis of variance, obtaining estimates of genotypic coefficient of variation, phenotypic coefficient of variation, environmental coefficient of variation, heritability and genetic advance for 11 parameters. He was also advised on SAS code for performing path analysis.
- Dr. B.N. Mandal advised Dr Deependra Singh Yadav, Scientist, NRC Grapes on pair wise comparison of treatments after performing Analysis of Covariance.
- Dr. Eldho Varghese advised Sh. Yathish K. R., Scientist from the Division of Genetics and Plant Breeding, DMR, New Delhi on the use of Jaccard's coefficient for clustering the genotypes based on marker data. Further, a program was written using SAS IML for calculating Polymorphism Information Content (PIC) for finding out the robustness of each of the marker.

COMPUTING FACILITIES

Wide Area Network

Internet services have been provided to the users and the website of IASRI is being updated regularly. This site has been visited 263524 times since 01 April 2012 and 1305829 times since 05 September 2003.

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PERSONNEL

Congratulations on your Appointment

Name	Designation of Joining IASRI	Effective Date
Dr. Anjani Kumar Chaubey	Head, Division of Computer Applications	22.01.2013

Congratulations on your Promotion

Name	Designation	Effective Date
Dr. Seema Jaggi	Principal Scientist	01.01.2009
Dr. Rajender Parsad	Principal Scientist	01.01.2009
Dr. LM Bhar	Principal Scientist	24.01.2012
Smt. Rajni Bala Grover	Technical Officer (T-7,8)	01.01.2012
Sh. PK Saxena	Technical Officer (T-9)	30.06.2012

Transfer

Name	To	Effective Date
Dr. N Okendro Singh	College of Agriculture, Imphal, Manipur as Associate Professor (Statistics)	28.02.2013

Wish you Happy Retired Life

Name	Designation	Effective Date
Dr. Vijay Kumar Bhatia	Director	28.02.2013
Sh. MS Vashishtha	AAO	30.01.2013
Sh. Vijay Kumar	F&AO	28.02.2013
Sh. AK Sondhi	T-7,8	28.02.2013
Sh. VS Gautam	T-5	28.02.2013
Sh. Rajesh Kumar	T-2	28.02.2013
Sh. RS Butaula	SSS	28.02.2013
Sh. Raj Pal	SSS	28.02.2013

Resignation

Name	Designation	Effective Date
Sh. Kapil Kumar Rana	Assistant	18.01.2013

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