

- Research Achievements
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### निदेशक की कलम से . . .

समाचार पत्र के इस अंक में प्रतिवेदनाधीन अवधि के दौरान प्रमुख अनुसंधानिक एवं प्रशिक्षण सम्बन्धी उपलब्धियों और संस्थान की अन्य महत्वपूर्ण गतिविधियों पर प्रकाश डाला गया है।

कृषि क्षेत्र परीक्षणों में, विषमांगता को नियंत्रित करने एवं संसाधनों का संरक्षण करने के लिए, सामान्यतः लघु एवं सन्निकट इकाइयों का अनुप्रयोग करके ट्रीटमेंट्स का मूल्यांकन किया जाता है। ऐसी परिस्थितियों में, किसी एक प्रयोगात्मक भूखण्ड पर अनुप्रयुक्त ट्रीटमेंट, नेबर भूखण्डों की अनुक्रिया को प्रभावित कर सकती है। उर्वरक, सिंचाई या कीटनाशक इत्यादि ट्रीटमेंट्स सन्निकट भूखण्डों में भी फैल सकते हैं जो नेबर प्रभावों का कारण बन सकते हैं। अतः नेबर प्रभावों के कारण परीक्षणालेख परिणामों में विचरणा के कारण दक्षता में प्रत्यक्ष हानि हो सकती है। ऐसी परिस्थितियों के लिए, नेबर संतुलित पॉक्ति-कॉलम अभिकल्पनाओं को प्रभावित किया गया है जिसमें प्रत्येक अन्य ट्रीटमेंट, प्रत्येक ट्रीटमेंट के नेबर के रूप में स्थिरांक रूप से पॉक्ति एवं कॉलम में प्रदर्शित होती है।

जनगणना एवं सांख्यिकी विभाग, कोलंबो, श्री लंका के सहभागियों के लिए "कृषि सर्वेक्षणों में सुदूर संवेदन एवं भौगोलिक सूचना तंत्र का अनुप्रयोग" पर एक अंतरराष्ट्रीय प्रशिक्षण कार्यक्रम आयोजित किया गया। पांच राष्ट्रीय प्रशिक्षण कार्यक्रम संचालित किए गए जिनमें एक एन.ए.आई.पी. के अन्तर्गत फसलों में पूर्वानुमान मॉडलिंग पर, एक एन.ए.आई.पी. कंसोर्टियम राष्ट्रीय कृषि अनुसंधान प्रणाली (एन.ए.आर.एस.) के लिए सांख्यिकीय संगणना का सुदृढीकरण के अन्तर्गत, एक भारतीय कृषि अनुसंधान परिषद् (आई.सी.ए.आर.) के शिक्षा विभाग के तत्वावधान में, एक भारतीय प्रौद्योगिकी संस्थान (आई.आई.टी.), नई दिल्ली के सहयोग से उच्च निष्पादन जैव-संगणना एवं मादक पदार्थों की अभिकल्पना पर संक्षिप्त पाठ्यक्रम एवं एक आर्थिकी एवं सांख्यिकी निदेशालय तथा राज्य सरकारों/संघ शासित क्षेत्रों के मंत्रालयों/विभागों के सेवारत सांख्यिकीय कर्मियों के लिए कृषि सांख्यिकी पर पुनश्चर्या प्रशिक्षण कार्यक्रम है। इन प्रशिक्षण कार्यक्रमों में 117 सहभागियों ने सहभागिता की।

डॉ. विजय कुमार भाटिया को ई.एस.सी.ए.पी. द्वारा कृषि सांख्यिकी स्टीयरिंग समूह के सदस्य के रूप में तथा डॉ. एस. अय्यप्पन, सचिव डेयर एवं महानिदेशक भा.कृ.अनु.प. द्वारा कृषि अनुसंधान एवं शिक्षा विभाग के लिए सांख्यिकीय समन्वयक के रूप में मनोनीत किया गया। तीन नई परियोजनाएँ प्रारंभ की गईं। संस्थान के वैज्ञानिकों/तकनीकी कर्मियों ने 14 अनुसंधानिक शोध पत्र, एक परियोजना रिपोर्ट, एक तकनीकी बुलेटिन तथा एक पॉपुलर लेख प्रकाशित किए। वैज्ञानिकों द्वारा अनेक बैठकों/सम्मेलनों/संगोष्ठियों/कार्यशालाओं इत्यादि में सहभागिता की गई।

आशा है कि इस अंक की विषय-वस्तु एन.ए.आर.एस. के वैज्ञानिकों के लिए सूचनाप्रद एवं उपयोगी होगी। समाचार पत्र की विषय-वस्तु में सुधार लाने हेतु आपके सुझावों का स्वागत है।

*(विजय कुमार भाटिया)*

(विजय कुमार भाटिया)



### 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.

In agricultural field experiments, in order to control heterogeneity and conserve resources, the treatments are generally assessed using small, adjacent units. Under such situation, the treatment applied to one experimental plot may affect the response on neighbouring plots. Treatments such as fertilizer, irrigation or pesticide may spread to adjacent plots causing neighbour effects. Thus, neighbour effects may contribute to variability in experimental results and lead to substantial losses in efficiency. To deal with such situations, Neighbour balanced row-column designs have been defined wherein every treatment has every other treatment appearing as neighbour constant number of times in rows and columns.

One international training programme on "Applications of Remote Sensing and GIS in Agriculture Surveys" for participants of Department of Census and Statistics, Colombo, Sri Lanka was organised. Five National training programmes have been conducted which include one on forecast modeling in crops under NAIP, one under NAIP consortium on Strengthening Statistical Computing for NARS, one under the aegis of Education Division of ICAR, one short course on High Performance Bio-Computing and Drug Design in association with IIT, New Delhi and one Refresher Training Programme on Agricultural Statistics for In-service Statistical Personnel of Directorates of Economics and Statistics and Ministries/Departments of State Govts./UTs. 117 participants attended these training programmes.

Dr. VK Bhatia was nominated as member of Steering Group for Agricultural Statistics by ESCAP and Statistical Coordinator for Department of Agricultural Research & Education by Dr. S. Ayyappan, Secretary DARE & Director General ICAR. Three new projects were initiated. Scientists/technical personnel of the Institute published 14 research papers, one project report, one technical bulletin and one popular article. The scientists also participated in number of meetings/conferences/symposia/workshops, etc. It is hoped that the contents of this document would be informative and useful for scientists in NARS. Any suggestions for improving the contents of the newsletter further would be highly appreciated.

*(VK Bhatia)*

(VK Bhatia)

## RESEARCH ACHIEVEMENTS

### • Neighbour Balanced Row-column Designs

Row-column designs are an important class of designs which are very much useful in situations when the heterogeneity present in the experimental material is in two directions viz., rows and columns. In agricultural field experiments, in order to control heterogeneity and conserve resources, the treatments are generally assessed using small adjacent units. Under such situation, the treatment applied to one experimental plot may affect the response on neighbouring plots. Treatments such as fertilizer, irrigation or pesticide may spread to adjacent plots causing neighbour effects. Thus, neighbour effects may contribute to variability in experimental results and lead to substantial losses in efficiency. Neighbour balanced row-column designs have been defined wherein every treatment has every other treatment appearing as neighbour constant number of times in rows and columns. Two types of models have been considered based on how the neighbour effects of treatments are taken into account viz., row-column model with non-directional neighbour effects, having same effects from all the four sides and row-column model with directional neighbour effects, having different effects from different sides. The methodology for estimating the direct and neighbour effects of treatments has been derived under above mentioned models. Series of row-column designs balanced for neighbour(s) have been obtained and are found to be variance balanced for estimating direct and neighbour effects.

## HUMAN RESOURCE DEVELOPMENT

### International Training Programme

- International training programme on **Applications of Remote Sensing and GIS in Agriculture Surveys** for participants of Department of Census and Statistics, Colombo, Sri Lanka was held from 09- 23 September 2011. Seven participants attended the two weeks training programme. The main objectives of the course were to familiarizing the participants with the basic concepts of remote sensing and GIS, acquainting them with the use of GIS and Remote Sensing software packages and providing exposure to application of remote sensing and GIS in agricultural surveys. The course broadly covered topics like Indian agricultural statistics system; sampling methods; statistical techniques for spatial data analysis, introduction to remote sensing and Indian space program; principles of remote sensing; satellite data reception and image interpretation; digital image processing; introduction to geographic information system; data models in GIS spatial analysis of vector and raster data; data quality and errors in GIS; applications of Remote Sensing and GIS in crop yield estimation, crop yield forecasting, agro-forestry; Land use Statistics, Surveys in Hilly region. In addition to this extensive hands on practice on Remote Sensing software- ERDAS Imagine and GIS software- ARCVIEW were also given. Besides this, field demonstration for Crop Cutting experiment was also conducted. Dr. Prachi Mishra and Dr. Tauqueer Ahmad was the Course Director and Course Co-Director respectively.



## National Trainings Programme

- A training programme on **Forecast Modeling in Crops** sponsored by NAIP was organized during 03-12 August 2011 at IASRI, New Delhi. 22 participants from various ICAR Institutes / SAUs attended the programme. The course aimed at acquainting the participants about various techniques for forecasting crop yields and forewarning pests and diseases. The training programme was an appropriate blend of theory and application. Various topics covered under the course were weather based pre-harvest crop forecasting, plant characters based regression and markov chain model, within year growth model, IMD approach for crop forecasting, pre-harvest crop yield forecasts based on remote sensing, Bayesian approach, non-linear time series modeling, forewarning of pests & diseases and crop losses, weather forecasting, agro-meteorological advisory service, etc. The participants were also taken to IMD to demonstrate weather forecasting system. The programme was inaugurated by Dr. R.P. Mishra, Principal Scientist & In-charge (Training), NAIP. Dr. Ramesh Chand, Director, NCAP was the Chief Guest at Valedictory function. Dr. Ranjana Agrawal was the Course Director and Sh. Amrender Kumar was the Course Co-Director for the training programme.
- A Short Course on **Bioinformatics in Agriculture** under the aegis of Education Division, ICAR was organized during 29 August - 07 September 2011 at IASRI, New Delhi for 24 participants. The training programme primarily aimed at learning the concepts of bioinformatics, genome analysis, protein structure prediction and data mining techniques in agriculture, with hands on session on the various bioinformatics software and tools. For this course, nominations were invited from agricultural scientists of ICAR and State Agricultural Universities. 65 applications were received and from which 24 participants joined this course. Among these 24 participants 15 were from ICAR institutes and 9 were from SAUs. The topics covered were basics of molecular biology, overview of bioinformatics, biological databases, basics of statistical bioinformatics, sequence alignment, multiple sequence alignment, unsupervised machine learning in biological data, supervised machine learning in biological data, resampling and cross validation techniques in biological databases, phylogenetic analysis, functional annotation of genes and gene prediction, basics of proteomics, high performance computing systems, linux overview, protein structure prediction, functional annotation of proteins, bio-programming, design of micro-array experiments, application of bioinformatics in crop diversity analysis and statistical issues of genome wide association studies. Sh. SB Lal was the Course Director for the training programme.
- A short course on **High Performance Bio-Computing and Drug Design in association with Supercomputing Facility for Bioinformatics and Computational Biology (SCFBIO)**, at Indian Institute of Technology, New Delhi was organized during 12-22 September 2011. The training programme was sponsored by National Agricultural Innovation Project, ICAR under sub-project "Establishment of National Agricultural Bioinformatics Grid in ICAR". The aim of the training programme was to provide practical knowledge to the participants in analysing and interpreting the genomic data through various bioinformatics software and tools. The training programme emphasized on genomics, proteomics, drug design and use of high performance bio-computing in field of agricultural bioinformatics research related to crop sciences, animal sciences, microbial studies and entomology. The course was practical oriented and training sessions were designed as combinations of lectures and hands on exercises on super computer facility. 20 Scientists/Senior Scientists of 08 ARS disciplines from 10 ICAR Institutes represented from 09 states participated in the training programme.
- A researchers training programme on **Genetics/Genomics Data Analysis Using SAS** was organized at IASRI, New Delhi during 19-24 September 2011 under NAIP Consortium Strengthening Statistical Computing for NARS with Dr. Rajender Parsad as Course Director and Dr. Amrit Kumar Paul and Dr.

Sunil Archak as course Co-ordinators. The training programme was inaugurated by Dr. S. Srinivasan, Former Director, CIRCOT, Mumbai. This training programme was attended by 24 participants from IARI, New Delhi; DMR, New Delhi; NBPGR, New Delhi; NRC on Plant Biotechnology, New Delhi; Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior; SKN College of Agriculture, Jobner; SKRAU, Rajasthan; Institute of Agricultural Sciences, BHU, Varanasi; TNV&ASU, Tamil Nadu; CIAH, Rajasthan; PAU, Ludhiana; JAU, Junagarh; IIVR, Varanasi; DRMR, Bharatpur; MPUA&T, Udaipur and IVRI, Izatnagar; The training was aimed at acquainting the participants with the Capabilities of SAS, SAS/ Genetics, JMP Statistical Discovery Softwares and JMP Genomics along with providing hands on experience. The reference manual was provided to the participants during the beginning of the training programme. The lectures on Statistics: introduction and concepts; SAS: an overview; JMP statistical discovery software, learning simple SAS macros, design resources server, Indian NARS statistical computing portal, analysis of experimental data, multi-variate analysis using SAS, variance component estimation, mixed model using SAS JMP: genomics, QTL mapping using JMP genomics, expressing analysis using JMP genomics; JMP genomics: QC workflow, logistic regression in genomic data analysis, proc QTL, statistical genetics using SAS and genetic data analysis using SAS, anov array for microarray data Analysis, diallel Analysis using SAS, SAS genetics, etc. were delivered. The valedictory function of the training programme was organized on 24 September 2011 and was addressed by Dr. VK Bhatia, Director, IASRI and Dr. VK Gupta, ICAR National Professor was the guest of honour on this occasion.



- A refresher training programme on **Agricultural Statistics** for 20 officers of Directorate of Economics and Statistics of different States was organized at the Institute during 26-30 September 2011. This training programme was funded by Central Statistical Organization (CSO), Ministry of Statistics and Programme Implementation (MOS&PI), Govt. of India (GOI). The broad objective of the training programme was to provide exposure to the participants about the Agricultural Statistics techniques. Dr UC Sud was the Course Director and Dr KK Tyagi and Dr Tauqueer Ahmad were Co-Course Directors of the programme. The lecture manual was brought out and softcopy of lecture manual was prepared in CD. Scientists and Guest faculty delivered the lectures. The inaugural function was organized on 26 September 2011, Dr. VK Gupta, ICAR National Professor was the chief guest of the function.
- A new course on M.Sc.(Bioinformatics) was initiated from the academic session 2011-12



## PANORAMA OF ACTIVITIES

### Annual Day Celebrations

- The Institute celebrated its 52<sup>nd</sup> Annual Day on 02 July 2011. Dr. Arvind Kumar, Deputy Director General (Education), ICAR, was the Chief Guest and delivered Nehru Memorial Lecture on Issues related to Agricultural Research and Education in the country. Dr. Madan Mohan Pandey, Deputy Director General (Engineering), ICAR presided over the function. Nehru Memorial Medal for the session 2008-2010 was awarded to Shri Hiranmoy Das, M.Sc. (Agricultural Statistics) student and to Shri Debasis Dutta, M.Sc. (Computer Application) student. VVR Murthy Award for the session 2008-2010 was awarded to Shri Hiranmoy Das, M.Sc. (Agricultural Statistics) student. The Annual Report of the Institute for the year 2010-11 was also released on this day.



### Brainstorming Workshop

- Organized a Brainstorming cum Workshop Session at CIFT on **Forecasting Technological Needs for Fishing and Fish Processing Sectors in India** on 07 July 2011 jointly with CIFT, Cochin under V-PAGe Sub Program II: Technology Forecasting and Policy Analysis.

### Birth Centenary of Professor PV Sukhatme

- Birth Centenary of Professor PV Sukhatme was celebrated on 27 July 2011. Dr. Madan Mohan Pandey, Deputy Director General (Engineering), ICAR, was the Chief Guest and Dr. NPS Sirohi, Assistant Director General (Engineering) was the Guest of Honour. Dr. VK Gupta, ICAR National Professor delivered a special talk on Combinatorics in controlled Sampling on the occasion. Dr. VK Bhatia, Director gave a brief outline of contributions of Professor PV Sukhatme. Speaking on the occasion, the Chief Guest suggested that this event should be celebrated every year. Dr. NPS Sirohi advised the students to take lead in these celebrations.



## Teacher's Day Celebrations

The Institute celebrated Teacher's Day on 05 September 2011 and honored Dr. AK Srivastava, Former Joint Director IASRI on this occasion. Dr. AK Srivastava delivered a lecture on Historical Development of Sample Surveys. Dr. HS Gaur, Dean and Joint Director Education, Indian Agricultural Research Institute, New Delhi presided over the function.



## हिन्दी सप्ताह

संस्थान में 14 से 20 सितम्बर 2011 के दौरान हिन्दी सप्ताह का आयोजन किया गया। 14 सितम्बर, 2011 को हिन्दी दिवस के अवसर पर हिन्दी सप्ताह का उद्घाटन हुआ। संस्थान में प्रत्येक वर्ष हिन्दी दिवस के अवसर पर डॉ. दरोगा सिंह स्मृति व्याख्यान का आयोजन किया जाता है जिसमें किसी सुप्रसिद्ध वैज्ञानिक द्वारा किसी भी वैज्ञानिक विषय पर हिन्दी में व्याख्यान दिया जाता है। इस वर्ष यह व्याख्यान भारतीय कृषि अनुसंधान परिषद् के उपमहानिदेशक, डॉ. अनिल कुमार सिंह (एन.आर. एम.) द्वारा “कृषि जल संकट-कितना गम्भीर?” विषय पर दिया गया और इस कार्यक्रम की अध्यक्षता राष्ट्रीय सांख्यिकीय आयोग के पूर्व सदस्य एवं ई.पी.ओ.एस. हेल्थ कन्सल्टेंट (इण्डिया) प्राइवेट लिमिटेड के अनुसंधान एवं मूल्यांकन के अध्यक्ष, डॉ. पदम सिंह जी ने की। इसके अतिरिक्त, वैज्ञानिकों प्रभागों में हिन्दी में सर्वाधिक वैज्ञानिक कार्य करने के लिए प्रभागीय चल-शील्ड के साथ-साथ प्रश्न-मंच, अन्ताक्षरी, हिन्दी वर्तनी प्रतियोगिता, हिन्दीतर कर्मियों के लिए हिन्दी श्रुतलेख एवं शब्दार्थ लेखन प्रतियोगिता आयोजित की गयी। प्रश्न-मंच एवं अन्ताक्षरी प्रतियोगिता के संचालकों द्वारा इन प्रतियोगिताओं को ऑडियो विजुअल रूप में प्रस्तुत किया गया जिससे ये प्रतियोगिताएँ अत्यन्त ही रोचक रहीं। सभी प्रतियोगिताओं में छात्रों सहित संस्थान के विभिन्न वर्गों के कर्मियों ने बड़-चढ़कर हिस्सा लिया। 21 सितम्बर, 2011 को हिन्दी सप्ताह के समापन समारोह के अवसर पर कार्यक्रम के मुख्य अतिथि, राष्ट्रीय कृषि आर्थिकी नीति अनुसंधान केन्द्र के निदेशक, डॉ. रमेश चन्द द्वारा हिन्दी सप्ताह के दौरान आयोजित प्रतियोगिताओं के सफल प्रतियोगियों के साथ-साथ वर्ष 2010-11 के दौरान अपना सर्वाधिक कार्य हिन्दी में करने के लिए “सरकारी कामकाज मूल रूप से हिन्दी में करने के लिए प्रोत्साहन योजना” के अन्तर्गत पुरस्कृत किया गया।



## हिन्दी कार्यशाला

संस्थान के कर्मियों के लिए संस्थान में दिनांक 08 सितम्बर, 2011 को “वैब सर्विसिस” विषय पर कार्यशाला का आयोजन किया गया। इस कार्यशाला में श्री एस.के.सबलानिया, तकनीकी अधिकारी (टी-9) व श्री एस.के.सिंह, सहायक अभियन्ता (टी 7-8) द्वारा “वैब सर्विसिस” विषय पर व्याख्यान दिए तथा अभ्यास करवाया। इस कार्यशाला में 23 कर्मियों (15 अधिकारियों व 08 कर्मचारियों) ने सहभागिता की। सभी कर्मियों द्वारा इस कार्यशाला की सराहना की गई।



## QRT Meeting

- A Meeting of newly constituted Quinquennial Review Team (QRT) was held on 30 September 2011 under the Chairmanship of Dr. Padam Singh, Former Member, National Statistical Commission and Head Research and Evaluation, EPOS, Health Consultants (India)



## Institute Research Committee(IRC) Meeting

- Institute Research Committee(IRC) meeting was held during 08-09 September 2011 to discuss progress of 35 research projects, out of which 25 projects were Institute funded and 10 funded by out side agencies. 18 new projects were also approved during the meeting.

## Other Meetings

- One meeting of the Institute Joint Staff Council was held on 16 August 2011.
- One meeting of the ICAR Staff Welfare Fund Scheme was held on 02 August 2011.
- One meeting of the Women Cell of the Institute was held on 17 August 2011.

## Seminars Delivered

Seminars in different areas of Agricultural Statistics and Computer Application 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) and M.Sc. (Computer Application) and Guest Seminars.

### The Details of Seminars Delivered

Category	Type of seminar	Number
Student	Course	09
	ORW	04
	Thesis	04
Scientist	Project Proposal	17
	Project Progress	07
	Project Completion	03
Total		44

## Research Co-ordination & Management Unit of the Institute is Renamed as Prioritization, Monitoring & Evaluation Cell

- As per the decision taken in the 131<sup>st</sup> meeting of Senior Officers held on 08 August 2011 at the Institute, the Research Co-ordination & Management Unit (RCMU) of the Institute is renamed as Prioritisation, Monitoring & Evaluation (PME) Cell. The Cell is constituted with the following composition:

Dr. Rajender Parsad	Officer Incharge
Dr. UC Dud	Member (R.F.D. Nodal Officer)
Dr. Seema Jaggi	Member
Dr. Tauqueer Ahmad	Member
Dr. Sivaramane N.	Member

## New Projects / Schemes / Programmes

The following new projects were initiated

- Study of synonymous codon usage and its relation with gene expressivity in halophilic bacteria has been initiated from 01 August 2011 in collaboration with NBAIM, Mau.
- On small area inference using survey weights has been initiated from 06 August 2011.
- Development of forecasting methodology for fish production from ponds of upland region has been initiated from 20 August 2011 in collaboration with Directorate of Cold Water Fisheries, Bhimtal.

## AWARDS AND RECOGNITION

### Professional recognition

- Dr. VK Bhatia nominated as "Statistical Coordinator" for Department of Agricultural Research & Education by Dr. S. Ayyappan, Secretary DARE & Director General ICAR. He was also appointed as member of Steering Group for Agricultural Statistics by Economic and Social Commission for Asia and the Pacific (ESCAP) of United Nations.

### Visit Abroad:

- Dr. VK Bhatia was deputed to attend ISO/TC/69 Technical Committee/ Sub-Committees and Working Groups at Berlin, Germany during 18-22 July 2011.
- Dr. Hukum Chandra visited Dublin, Ireland during 21-26 August 2011 for receiving the International Statistical Institute's World Bank Fund Award and to attend the ISI World Statistics Congress.

- Ramasubramanian V. is undergoing International training in the area of "Science Policy and Technology Forecasting" at University of Houston, USA under NAIP-HRD-L&CD, Social Sciences Division during 18 August to 17 November 2011.
- Dr. Anil Rai, Head, Centre for Agricultural Bio-informatics (CABin) has been deputed to FAO, Srilanka to provide Consultancy Services on the topic Feasibility Study on the Use of GIS/Remote Sensing for the Census of Agriculture by Food and Agricultural Organisation during 27 September to 11 October 2011.

## PUBLICATIONS

### Research Papers

1. Chandra, G, Tiwari, N. and Chandra, H (2011). Adaptive Cluster Sampling Based on Ranked Sets. *Advances in Methodology and Statistics*, **8(1)**, 39-55.
2. Chandra, H and Chambers, R (2011). Small area estimation under transformation to linearity. *Survey Methodology*, **37 (1)**, 39-51.
3. Chandra, H, Bathla, HVL and Sud, UC (2010). Small area estimation under a mixture model. *Statistics in Transition*, **11 (3)**, 503-516.
4. Garg, KC, Kumar, S, Bhatia, VK, Ramasubramanian, V, Kumar, A and Kumari, J (2011). Plant genetics and breeding research: Scientometric profile of selected countries with special reference to India. *Annals of Library and Information Studies*, **58(6)**, 184-197.
5. Ghosh, H, Gurung, B and Prajneshu (2011). Methodology for combining linear and nonlinear time-series models for cyclical data. *J. Ind. Soc. Agril. Statist.*, **65**, 237-256.
6. Laxmi, Ratna Raj and Kumar, Amrender (2011). Forecasting of powdery mildew in mustard (*Brassica Juncea*) crop using artificial neural networks approach. *Ind. J. Agri. Sci.*, **81(9)**, 855-860.
7. Paul, AK, Alam, Wasi, Singh, Pal (2011). Average linkage method clustering rice (*Oryza sativa*) producing states of India, *Ind. J. Agri. Sci.*, **81(8)**, 756-9.
8. Ramasubramanian V, Agrawal, R and Bhar, L (2010). Crop Forecasting using multiple Markov chains. *Assam Statist. Rev.*, **24(1)**, 37-56.
9. Sahu TK, Rao AR, Singh A, Behera BK, Mohapatra T. (2011). In silico identification of residues for anoxia tolerance across species. *Online J. Bioinformatics*, **12(1)**, 175-197.
10. Sarkar, RK, Rao, AR, Wahi, SD and Bhat, KV (2011). A comparative performance of clustering procedures for mixture of qualitative and quantitative data-An application to black gram. *Plant Genetic Resources-Characterization and Utilization*. (Published Online) <http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=8334452 &fulltextType=RA&fileId=S1479262111000827>
11. Singh, N Okendro (2011). A method for fitting of Schaefer model with autoregressive of order one. *Asian Fisheries Science*, **24(3)**:197-208.
12. Sivaramane, N and Mathur, VC (2010). Forecasting rice exports from india: An application of Box-Jenkins methodology. *Agricultural Situation in India*, **67(6)**, 321-325.
13. Wahi, SD and Rao, AR (2011). Some investigations on sampling variance of genetic correlation. *The IUP Journal of Genetics & Evolution*, **4(2)**, 27- 44.
14. Yadava, N, Sarika, Iquebal, MA and Md. Akram (2011). In-silico analysis and homology modeling of coat protein of Mungbean Yellow Mosaic India Virus. *J. Food Legumes*, **24**, 138-141.

### Research Project Reports

1. Varghese Eldho and Jaggi Seema (2011). Response surface methodology incorporating neighbour effects (**IASRI/PR-05/2011**), IASRI, New Delhi.

## Technical Bulletin

1. Dalvi, MB, Agrawal, Ranjana, Salvi, BR, Misra, AK, Pandey, G and Chandra, Rakesh (2011). Forewarning powdery mildew of mango (*Mangifera indica* L.) caused by *Oidium mangiferae* Berthet. *Tech. Bull. AICRP(STF) 2011(4)*. Released by DDG(Hort) on 29 September 2011.

## Popular Article

1. Nanda, Meena (2011). Thought- Hunger and India. *Agriculture Today, the National Agriculture Magazine*, April 2011, 51-56.

## INVITED LECTURES DELIVERED

- Dr. Rajender Parsad delivered 3 lectures on (i) Fundamentals of Designs of Experiments, (ii) Design Resources Server and Indian NARS Statistical Computing Portal and (iii) MANOVA and Principal Component Analysis to the participants of the training programme on Data Analysis Using SAS organized at Punjab Agricultural University, Ludhiana by NDRI, Karnal during 11-16 July 2011 (lectures were delivered on July 16, 2011).
- Dr. Anil Rai delivered
  - a lecture on analysis of synonymous codon usage pattern in the training program related to Genomics in Agriculture at Indian Institute of Pulse Research, Kanpur on 06 July 2011.
  - an invited lecture on data warehousing on 29 July 2011 in the seminar on Enterprise Report Delivery roadmap through Data Warehousing and Data Mining organized by Delhi Institute of Advanced Studies, New Delhi
- Dr. Krishan Lal delivered five lectures on Design Resource Server, Design of Experiments (CRD, RCBD, LSD, Factorial RBD, BIBD, Split and Strip plot designs), Multivariate Analysis (PCA, Cluster Analysis and MANOVA), Non-linear Models (Gompertz, Logistic and Mono-molecule) using SAS in the Training Programme of NAIP on Strengthening Statistical Computing for NARS during the period 12-17 September 2011 at MPUAT, Udaipur.
- Dr. Susheel Kumar Sarkar delivered 05 lectures on Analysis of Experimental Data during a training programme on Data Analysis Using SAS organized at UBKV, Pundibari, Coochbihar, West Bengal during 19-24 September 2011.
- Following scientists delivered lectures during Summer School on Decision Support System in Agriculture Using Economic Tools held at NCAP, New Delhi during 02-22 August 2011 on the following topics:
  - Dr. Alka Arora - Clustering: Case Studies in Agriculture
  - Dr. Rajender Parsad - SAS: An Overview (on 16 August 2011).
  - Dr. Ashok Kumar - Consumer Surplus Model
  - Sh. Amrender Kumar - Time Series Modelling
  - Dr. Prajneshu - Nonlinear Modelling (and conducted one practical in this area)
  - Dr. Ramasubramanian V. (i) Regression analysis and (ii) DSS by CART model
- Dr. Dwijesh Chandra Mishra delivered lectures of theory with hands-on session on Application of SAS software in Basic Statistical Analysis, Correlation and Regression Analysis, Multivariate Analysis and Analysis of Design of Experiments in the training conducted under NAIP project entitled "Strengthening of Statistical Computing for NARS" during 01-03 August 2011 at Maharana Pratap University of Agriculture and Technology (MPUAT), Udaipur.

- Dr. N Sivaramane delivered 4 lectures on (i) Regression diagnostics and remedies for autocorrelation, heteroscedasticity, multicollinearity and influence points, (ii) Multiple regression analysis, (iii) Applications of limited dependent variable models- logit, probit, multinomial logit and ordinal logit in social sciences and (iv) Estimation of household consumption using econometric models during 21 days Summer School on Quantitative Techniques in Policy Planning, Monitoring, Modeling, Analysis and Impact Assessment of Hill Agriculture at the Division of Agricultural Economics and Statistics, ICAR Research Complex for NEH Region, Barapani during 03-23 August 2011.
- Following scientists delivered lectures during training programme at National Academy of Statistical Administration (NASA), Greater Noida, Gautam Budh Nagar, UP on the following topics:
  - Dr. UC Sud - Sampling Methodologies and Techniques (Multivariate, Stratified, Systematic Methods, Estimates & Limitations) (on 29 August 2011)
  - Dr. Prajneshu - Lecture and conducted practical on Linear and Nonlinear Statistical Models (on 08 September 2011).
  - Dr. Tauqueer Ahmad - Sampling and non-sampling errors and precision of estimates (on 30 August 2011)

## PAPER PRESENTED

1. Small Area Estimation (SAE 2011) Conference (Specifically contributed session on Spatio-Temporal Small Area Modelling) at Trier, Germany during 11-13 August 2011.
  - Chandra, H, Salvati, N, Chambers, R and Tzavidis, N (2011). Small Area Estimation under Spatial Nonstationarity. **(Invited Paper)**
  - Chambers, R and Chandra, H (2011). A Semiparametric bootstrap for clustered data. **(Invited Paper)**
2. International Statistical Institute World Statistics Congress 2011 (ISI 2011) at Dublin, Ireland during 21-26 August 2011.
  - Chandra, H, Sud, UC, and Salvati, N (2011). Estimation of district level poor households in the state of Uttar Pradesh in India by combining NSSO survey and census data-An application of small area estimation.

## PARTICIPATION

### Conferences / Workshops / Seminars / Symposia etc

- Director's Conference of ICAR Institutes on 15 July 2011 at NBPGR, New Delhi.
- Two days Workshop on Garuda-NKN meet at CDAC, Bangalore during 15-16 July 2011.
- ICAR Foundation Day on 16 July 2011 at NASC Complex, New Delhi.
- International Conference on Food Security and Hunger Management on 28 July 2011 at VishwaYuvak Kendra, Chanakyapuri organized by MS Swaminathan Research Foundation, Indian Agricultural Research Institute (IARI) and Consultative Group on International Agricultural Research (CGIAR). (inaugural session)
- One day Workshop on Introduction of Web Application Security on 17 August 2011 held at Indian Computer Emergency Response Team (CERT-in), Department of Information Technology, CGO Complex, New Delhi.

## Training

- Dr Prachi Misra Sahoo attended ten days training program on Hyperspectral Remote Sensing in Agriculture: HYPERAGRI in the Division of Agricultural Physics, IARI, New Delhi during 02-11 August 2011.
- Dr. Eldho Varghese completed 93<sup>rd</sup> Foundation Course for Agricultural Research Services (FOCARS) on 24 August 2011 offered by National Academy of Agricultural Research Management (NAARM), Hyderabad.
- Short course on High Performance Bio-computing and Drug Design during 12 -22 September 2011 at SCFBio, IIT Delhi.

## Meetings

- 221<sup>st</sup> meeting of the Governing Body of the ICAR Society on 05 July 2011 at NASC Complex, New Delhi.
- Meeting regarding the project 'Prioritization of Rainfed area in the country' on 07 July 2011 at National Rainfed Area Authority (NRAA), NASC, Complex, New Delhi.
- 384<sup>th</sup> meeting of the Academic Council at Conference Hall, Central Library, IARI, New Delhi on 08 July 2011.
- 12<sup>th</sup> Coordination Committee Meeting (CCM) of AICRP on Utilisation of Animal Energy with Enhanced System Efficiency located at CIAE, Bhopal organized at Birsa Agricultural University, Ranchi (Jharkhand) during 08-10 July 2011.
- Discussion on Real time surveillance in tomato in a thematic area of Pest and diseases dynamics in relation to climatic change at NCIPM, New Delhi on 15 July 2011 under NICRA project.
- Partners meeting on Insect Genomics on 28 July 2011 at NBAIL, Bangalore.
- Annual Review Meeting on FASAL project during 01-02 August 2011 at Pune, addressed audience in inaugural session, delivered a lecture on 'Weather based Pre-harvest Forecast of Crop Yield – IASRI Approaches' and gave comments and suggestions as panelist.
- Orientation programme of newly admitted student of PG School IARI, New Delhi for the students of MSc (Agricultural Statistics, Agricultural Bioinformatics and Computer Application) and PhD (Agricultural Statistics) held at IASRI, New Delhi on 06 August 2011.
- National Consultation on Gender Perspective in Agriculture at NASC Complex, Pusa, New Delhi during 08-09 August 2011.
- Meeting regarding modus operandi of collaboration between AICRP on micro and secondary nutrients and pollutant elements in soil and plants with Dr AK Shukla, Project Co-ordinator on 09 August 2011. Future course of actions were decided in the meeting.
- 2<sup>nd</sup> Consultative Meet of Deans of Agricultural Universities on Aligning SAU's Education and Research system with ICAR VISION 2030 held at SD Agricultural University, Sardarkrushinagar, Dantiwada, Gujarat during 12-14 August 2011.
- Institute Joint Staff Council meeting held on 16 August 2011.
- Meeting of executive committee of DBT on Bioinformatics activities on 24 August 2011 at IARI New Delhi.
- Meeting with Adviser (Horticulture) held at IASRI on 25 August 2011 regarding the scheme to be recommended for the 12th Five Year Plan to obtain reliable horticulture statistics.
- 3<sup>rd</sup> meeting of the Working Group to decide about course contents and resource persons for development of the subject specific modules on "Agriculture and Rural Statistics" held under the Chairmanship of Dr VK Bhatia, Director of the Institute on 26 August 2011.

## CONSULTANCY/ADVISORY SERVICES PROVIDED

- Mohd. Hashim, Division of Agronomy, Ph. D. (Agronomy) student, IARI, New Delhi was advised on block design with factorial treatment structure for the experiment on Crop diversification and nutrient management in mango based agri-horticulture system. The two factors were crops under mango tree and nitrogen application to mango tree. The crops under mango were cowpea, pearl millet, soybean and no crop. The three levels of fertilizer to mango tree were control, 50%RD of NP+50%RD of FYM and RD of NP+RD of FYM. The experiment is to be conducted where five different variety of mango (Pusa Arunima, Pusa Surya, Amarpali, Mallika, Dasher) with 25 trees for each variety. The plantation of each variety was considered as a block and each block was divided into 8 plots with 3 trees per plot. Following block design with factorial treatment structure was suggested:

Block 1	C1F1	C2F1	C3F1	C4F1	C1F2	C2F2	C3F2	C4F2
Block 2	C1F2	C2F2	C3F2	C4F2	C1F3	C2F3	C3F3	C4F3
Block 3	C1F3	C2F3	C3F3	C4F3	C1F1	C2F1	C3F1	C4F1
Block 4	C1F1	C2F1	C3F1	C4F1	C1F2	C2F2	C3F2	C4F2
Block 5	C1F2	C2F2	C3F2	C4F2	C1F3	C2F3	C3F3	C4F3

This design is obtained by repeating first two blocks of the singular group divisible design S53 with parameters  $v = 12$ ,  $b = 3$ ,  $r = 2$ ,  $k = 8$ ,  $m = 3$ ,  $n = 4$ ,  $l_1 = 1$ ,  $l_2 = 1$ . The final parameters of design are  $v = 12$ ,  $b = 5$ ,  $k = 8$ . He was also given an alternative with 6 plots per block, each block containing 4 trees. The layout of the design is

Block 1	C1F3	C2F2	C3F1	C3F2	C3F3	C4F3
Block 2	C1F2	C2F2	C2F3	C4F1	C4F2	C4F3
Block 3	C1F1	C1F2	C2F1	C2F3	C3F2	C4F3
Block 4	C1F1	C1F2	C1F3	C2F1	C3F3	C4F2
Block 5	C2F1	C3F1	C3F2	C3F3	C4F1	C4F2

- Dr. Purushottam Sharma, IGFR, Jhansi was advised for the data analysis on the project Livelihood condition and Livestock production system of resource poor farmers, on Sampling methodology, Statistical analysis, Optimization of herd size, and Sampling methodology:
- Dr. AK Mishra, IGFR, Jhansi was advised for the data analysis on the project Nutritional Mapping of Crop Residue and its implication for livestock feeding on 04.08.2011 on sampling methodology, estimation of grain straw ratio, prediction of crop residue etc.
- Ms. Shinoji KC, Scientist from the Division of Agricultural Extension, IISS, Bhopal was advised on the use of Kruskal-Wallis test for identifying the major factors behind the shift from inorganic farming to organic farming in Kerala based on the survey conducted on eighty farmers as a part of her Ph. D. thesis work.

## 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 92775 times since 01 April 2008 and 926910 times since 05 September 2003.

## PERSONNEL

### Congratulations on your Appointment

Name	Designation	Effective Date
Dr. Prajneshu	Head, Division of Biometrics and Statistical Modelling	28.07.2011
Dr. Anil Rai	Head, Centre for Agricultural Bio-informatics	28.07.2011
Dr. KN Singh	Head, Division of Forecasting and Econometric Techniques	09.08.2011
Sh Bishal Gurung	Scientist	03-09-2011
Sh Kaustav Aditya	Scientist	03-09-2011

### Wish you happy Retired Life

Name	Designation	Date
Dr. PK Batra	Principal Scientist	31.07.2011
Sh. PS Syal	Sr. Admin. Officer	31.07.2011
Dr. Chandrahas	Principal Scientist	30.09.2011

### Transfer

Name	From/To	Effective Date
Sh. Krishan Kumar, F&AO	To NAIP, New Delhi	04.07.2011
Sh. Vijay kumar, F&AO	NAIP, PIU, KAB-II	11.07.2011
Dr. Yogesh Gautam, Scientist	Directorate of Mushroom Research, Solan	11.08.2011
Sh. Surender Kumar Sharma, (T-7-8)	To ICAR, Krishi Bhawan	17.08.2011
Smt. Gursharan Kaur, (T-6)	Central Research Institute for Jute and Allied Fibres, Kolkata	26-08-2011

### New Faculty Members of PG School IARI, New Delhi.

#### Discipline of Agricultural Statistics

- Dr. KN Singh, Principal Scientist & Head, Division of Forecasting and Econometric Tecniques
- Dr. Sanjeev Panwar, Scientist (SS)
- Dr. Ranjit Kumar Paul, Scientist
- Dr. Mir Asif Iquebal, Scientist
- Dr. BN Mandal, Scientist
- Dr. Susheel Kumar Sarkar, Scientist
- Dr. NO Singh, Scientist
- Dr. Eldho Varghese

#### Discipline of Agricultural Economics

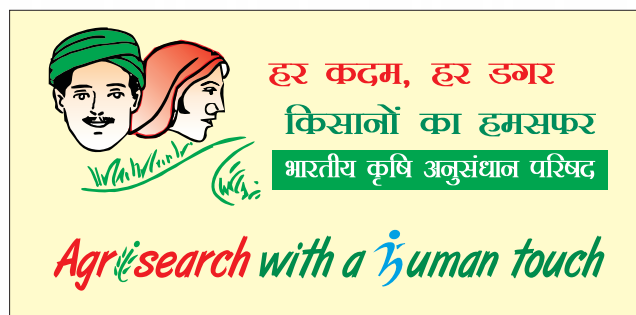
- Dr. Sivaramane N

#### Discipline of Agricultural Bioinformatics

- Dr. Dwijesh Chandra Mishra
- Dr. Sarika
- Dr. Sanjeev Kumar

## Saleable Technologies

- Statistical Package for Factorial Experiments (SPFE 1.0)
- Statistical Package for Agricultural Research (SPAR 2.0)
- Statistical Package for Augmented Designs (SPAD)
- Statistical Package for Block Designs (SPBD 1.0)
- Statistical Package for Animal Breeding (SPAB 2.0)
- Software for Survey Data Analysis (SSDA 1.0)



## Published by

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