IASRI NEWS

Volume 18 No. 4 January-March, 2014

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.

The first supercomputing hub for Indian Agriculture ASHOKA (Advanced Super-computing Hub for OMICS Knowledge in Agriculture) established at Centre for Agricultural Bioinformatics (CABin), Indian Agricultural Statistics Research Institute, was dedicated to the Nation by Shri Sharad Pawar, Honourable Union Minster of Agriculture and Food Processing Industries in presence of Dr. Charan Das Mahant, Shri Tariq Anwar, Union Minsters of State for Agriculture and Food Processing Industries and Dr. S Ayyappan, Secretary DARE and D.G. ICAR on 15 January 2014.

ICAR-ERP (Enterprise Resource Planning) system which includes solution for financial project, human resource, material and payroll management has been implemented in IASRI, IARI, NAARM, CIFE, NDRI from 1st February 2014 and ICAR HQ and IVRI w.e.f. 26 February 2014. System has been implemented in CPRI, CRRI, NBSS&LUP, CAZRI, CIAE, CSWCRTI, IGFRI, CRIDA, IIHR, CMFRI and NBPGR from April 2014. ICAR-ERP is hosted on IASRI website and can be accessed through URL: http://icarerp.iasri.res.in and it can also be visited through http://www.iasri.res.in/misfms/.

Indian NARS Statistical Computing Portal (http://stat.iasri.res.in/sscnarsportal) has been strengthened by adding the modules of Cross over designs and Estimation of genetic variance-covariance from block designs. With these 2 new additions, now 24 analysis modules are available on this portal which have been classified into four broad categories as: Basic Statistics, Design of Experiments, Multivariate Analysis and Statistical Genetics.

Calibration estimators of finite population total for two stage sampling design have been proposed and through empirical evaluation it was found that the proposed estimators were performing better than the usual Horvitz Thompson estimator under two-stage sampling design. Through limited empirical evaluation it was found that all the higher order calibration estimators were also efficient.

A general method of constructing row-column design with two rows has been developed for orthogonal estimation of main effects and two factor interaction in minimum number of runs for orthogonal parameterization.

One Statistics Module of the Subject Matter Training for Scientists from Islamic Republic of Afghanistan and one Modular Course on Statistical Methods for Agricultural Research for the participants of an International M.Sc. Programme for Afghan Nationals on Teaching of Post-Graduate courses in Agronomy were organised. Two Refresher Training Programmes on Integrated Sample Survey Methodology sponosored by Ministry of Agriculture, Govt. of India and one trainining programme on Computational and Statistical Advances in Biometrics for 'omics' Data, under CAFT sponosored by Education Division, ICAR were organised. Three training programmes sponosored by NAIP, one each on Data Analysis using SAS, under SSC-NARS; Computational Aspect for NGS Data Analysis: a sojourn from lab to field at Ome Research facility under NABG and Advanced Analytical Techniques in Bioinformatics under Bioprospecting of genes and allele mining for abiotic stress tolerance were also organised. Apart from these one training workshop on Computer Assisted Text Analysis under "Mapping the Cultural Authority of Science across Europe and India (MACAS-EU & INDIA)" project sponosored by Indian Council of Social Science Research (ICSSR), one workshop cum Koha Professional Training under "Strengthening of Digital Library and Information Management" sponosored by NAIP and one Sensitization Workshop on Internet Protocol Ver. 6 (IPv6) were also organised.

Scientists of the institute have received various awards & recognitions. Scientists have visited various countries on different assignments.

During the period two new projects were initiated. Scientists of the Institute have published 17 research papers, 07 leaflets/brochures, 02 popular articles, 01 book chapter and 01 reference manual. Besides this, 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

ASHOKA: A Milestone for Agricultural Research is dedicated to Nation. The first supercomputing hub for Indian Agriculture ASHOKA (Advanced Super-computing Hub for OMICS Knowledge in Agriculture) has been established at Centre for Agricultural Bioinformatics (CABin), Indian Agricultural Statistics Research Institute, New Delhi, India. The facility is set up in a state-of-art data centre and was dedicated to the Nation by Shri Sharad Pawar, Honourable Union Minster of Agriculture and Food Processing Industries in presence of Dr. Charan Das Mahant, Shri Tariq Anwar, Union Minsters of State for Agriculture and Food Processing Industries and Dr. S Ayyappan, Secretary DARE and DG ICAR on January 15, 2014.

In order to provide access to this advanced computing facility to researchers, a National Bio-Computing Portal has been launched through which authenticated users will be able to perform their biological data analysis. This portal consists of number of computational biology and agricultural bioinformatics software/ workflow/pipelines which will be able to automate routine biological analytics in seamless manner. Also, a Genome Submission Portal is being developed on lines of NCBI to assist our researchers for submission of their genomic data sets obtained through experimentations. This will not only help us in conservation of biodiversity of the country but protect our IPR at international level. These bio-computing resources can be accessed through the institute Web site (http://iasri.res.in) or directly from (http://cabgrid.res.in).

Management Information System (MIS) including Financial Management System (FMS) in ICAR. This NAIP funded project was started at IASRI from January 2012 with the objectives to implement the robust and flexible MIS & FMS at ICAR and to establish ICT Infrastructure and Unified messaging & Web hosting solution for ICAR. For this, an ICAR-ERP solution has been developed based on customization of ORACLE ERP software and the solution has the following components:

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(a) Financial Management: General ledger, Accounts Payable, Accounts Receivable, Cash Management, Fixed Assets Management, Budget Management and Grants.

(b) Project Management: Project Information, Costing, Project Documents, Contract Management and Collaboration of Project documents.

(c) Material Management: Purchase and Inventory Management.

(d) Human Resource: Employee information, HR policies, Leave Management, Performance and Appraisal System.

(e) Payroll System: Salary, GPF, Pension Payment, Retirement Benefit Calculation and Income tax calculation solutions for ICAR employees.

ICAR-ERP system has been developed under the guidance of core team identified in each of these areas and tested in the user acceptance testing workshops organized at IASRI from 08-28 May 2013. Sensitization workshops and trainings activities were carried out in collaboration with partner organizations at their respective locations as well as at lead centre IASRI. More than 500 Personnel from different sections of NBPGR, New Delhi; IARI, New Delhi; CSSRI Karnal, NBAGR Karnal, IASRI, DWR Karnal, DMR Solan, CPRI, Shimla, IVRI Bareilly, ICARER Patna and CRIJAFT Calcutta were sensitized for MIS/FMS implementation along with detailed discussion on data digitization templates during Sensitization workshops.

A number of training programs were organized at IASRI and Partner organization for imparting training to institute personnel on different modules of ICAR-ERP solution. Personnel from NDRI, IARI, NAARM, CRIDA, CIFE, CIRCOT, IVRI and Delhi based institutes NCAP, NBPGR, IASRI, DMR, DFR, NCIPM, NRCPB were given training on the ICAR-ERP solution. Training sessions are going on simultaneously in the institutes where go-live is planned in April 2014. Eleven (11) user manuals were prepared along with Computer Based Training Material (CBT- 102). This material is available on the project website http://www.iasri.res.in/misfms/.

ICAR-ERP has been implemented in IASRI, IARI, NAARM, CIFE, NDRI from 1st February 2014 and ICAR HQ and IVRI from 26th February 2014. System will be implemented in CPRI, CRRI, NBSS&LUP, CAZRI, CIAE, CSWCRTI, IGFRI, CRIDA, IIHR, CMFRI and NBPGR from April 2014.

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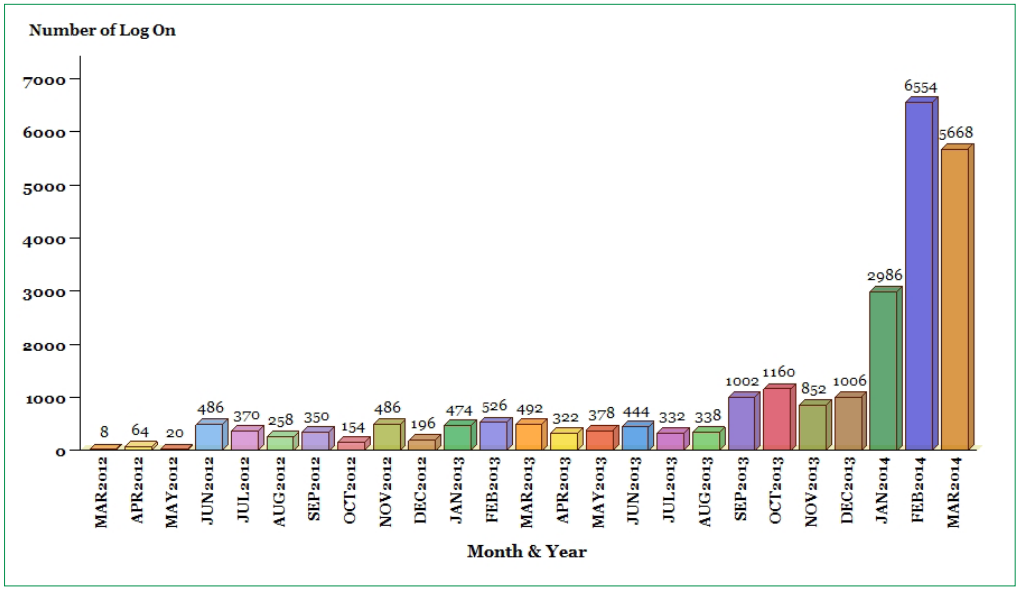
ICAR-ERP is hosted on IASRI website and can be accessed through URL: http://icarerp.iasri.res.in and it can also be visited through http://www.iasri.res.in/misfms/.

Indian NARS Statistical Computing Portal: For providing service oriented computing to Indian NARS users, Indian NARS Statistical Computing Portal (http://stat.iasri.res.in/sscnarsportal) has been strengthened by adding the modules of Cross over designs and Estimation of genetic variance-covariance from block designs. With these 2 new additions, now 24 analysis modules are available on this portal which have been classified into four broad categories as: Basic Statistics, Design of Experiments, Multivariate Analysis and Statistical Genetics.

The portal is extensively being used throughout NARS and has helped the researchers in analyzing their data without losing any time. The total hits to the portal are: 1,97,816 since April 01, 2011 which amounts to more than 100 hits per day. Based on the user logged information, the total number of logged in users from Indian NARS since March 2012 are 24,926. The month wise distribution of logged in users is depicted below:



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A study on calibration estimators of finite population total for two stage sampling design. The need for statistical information seems endless in the modern society. In particular, data are regularly collected to satisfy the need for information about specified sets of elements, called as finite population. One of the most important modes of data collection for satisfying such needs is a sample survey, that is, a partial investigation of the finite population. In sample surveys, auxiliary information on the finite population is often used to increase the precision of estimators of finite population total or mean or distribution function. In the simplest settings, ratio and regression estimators incorporate known finite population parameters of auxiliary variables. The Calibration Approach proposed by Deville and Sarndal (1992) is one of the other techniques widely used for making efficient use of auxiliary information in survey estimation. Further, Singh *et al.* (1998) considered the problem of estimation of variance of the calibration estimator and proposed the Higher Order Calibration approach. However, most of the work related to calibration estimation for the finite population parameters was mostly restricted to only Single Stage or Two Phase sampling designs. But, large to medium scale surveys generally considers the two stage or multistage sampling designs. Thus, a study on calibration estimators of finite population total for two stage sampling design was under taken. In this study we have proposed both lower level calibration estimators of Deville and Sarndal (1992) and higher order calibration estimators of Singh *et al.* (1998) under two stage sampling design when there was availability of population level complex auxiliary information for both the stages of selection of the sample i.e. at the primary stage unit (psu) level and secondary stage unit (ssu) level. The improved variance estimators of the proposed calibration estimators has been developed using the higher order calibration approach. Further, calibration estimators considering the situation that size of the psu and ssu was both unknown and known have also been developed. The variance and variance estimator of all the proposed estimators were found. Again, calibration estimators for the situation when there was unavailability of auxiliary information at the primary stages of selection have been developed. For empirical evaluation of the proposed estimators, SAS code for two stage sampling design was developed using SAS "Macro" Facility. Through, empirical evaluation it was found that all the proposed calibration estimators were performing better than the usual Horvitz Thompson estimator under two-stage sampling design. Through limited empirical evaluation it was found that all the higher order calibration estimators were also efficient.

Row-column designs for factorial experiments in two rows. In a row-column design set up, because of practical considerations it may not be possible to accommodate more than two experimental units in a column. One application of row-column designs with two rows is in factorial experiments where the treatment structure is factorial in nature. Due to cost and time considerations, it may not be possible to run a design for estimation of all the factorial effects. The experimenter may, however, be interested in orthogonal estimation of all the main effects and two factor interactions. Thus it is required to obtain a general method of construction of row-column designs with two rows, which permit orthogonal estimation of all main effects and two factor interactions in factorial experiments and at the same time minimize the number of runs (or design points). To deal with such situations, a general method of construction of row-column designs with two rows for orthogonal estimation of main effects and two factor interactions in factorial experiments in minimum number of runs has been given for orthogonal parameterization. A catalogue of efficient row-column designs for 2^n ($2 \leq n \leq 9$) factorial experiments in minimum number of replications has been prepared. Here in all the designs main effects and two factor interaction are estimated orthogonally. A SAS program for checking the orthogonal estimation of main effects and two factor interactions has been prepared and is available with the authors.

The above discussion relates to the factorial experiments run in row-column design, where the interest of the experimenter is in orthogonal paramertization of the factorial effects. However, in some experimental situations, like designs for 2-colour micro-array experiments, where null state or baseline may exist, the

experimenter would be interested in baseline parameterization rather than orthogonal parameterization. Since the designs obtained are in incomplete columns, it is important to study the optimality aspects of designs obtained. In other words, there is a need to obtain a general procedure of generating efficient w-optimal row-column designs in two rows for *n*-factors mixed level factorial experiments based on baseline parameterization. To deal with such situations, a general procedure of obtaining efficient w-optimal row-column designs in two rows for *n*-factors mixed level factorial experiments based on baseline parameterization has also been developed. An equation has been obtained *i.e.* to calculate the number of columns required to make a row column design w-optimal. Here *v* is the total number of treatment combinations and *b* is the number of columns required to make the design w-optimal. A catalogue of w-optimal row-column designs in two rows for *n*-factors mixed level factorial experiments based on baseline parameterization has been prepared.

HUMAN RESOURCE DEVELOPMENT

Training Programmes/ Workshops Organised

S.No.	Title	Venue	Date	Sponsored by	No. of Participants
Trainings					
1.	Statistics Module of the Subject Matter Training for Scientists from Islamic Republic of Afghanistan Coordinator: Seema Jaggi	IASRI, New Delhi	15 - 22 January, 2014	IARI, New Delhi	04
2.	Refresher Training Programme on Integrated Sample Survey Methodology Course Director: Hukum Chandra Course Co-Director: Kaustav Aditya	IASRI, New Delhi	20-24 January 2014	Ministry of Agriculture, Govt. of India	24
3.	Computational and Statistical Advances in Biometrics for 'omics' Data, under CAFT Course Director: SB Lal Course Co-Director: KK Chaturvedi Sanjeev Kumar	IASRI, New Delhi	21 January to 10 February 2014	Education Division, ICAR	23
4.	Data Analysis using SAS under Strengthening Statistical Computing for NARS Course Director: Rajender Parsad	IASRI, New Delhi	29 January to 05 February 2014	NAIP	23
5.	Refresher Training Programme on Integrated Sample Survey Methodology Course Director: Hukum Chandra Course Co-Director: Kaustav Aditya	IASRI, New Delhi	03-07 March 2014	Ministry of Agriculture, Govt. of India	24
6.	Computational Aspect for NGS Data Analysis: A Sojourn from Lab to Field at Ome Research Facility under NABG Course Director: Dinesh Kumar Course Co-Director: Mir Asif Iquebal	AAU, Anand	04-13 March 2014	NAIP	20
7.	Advanced Analytical Techniques in Bioinformatics under Bioprospecting of Genes and Allele Mining for Abiotic Stress Tolerance Course Director: AR Rao Course Co-Director: Sudeep Marwah SD Wahi PK Meher	IASRI, New Delhi	10-19 March 2014	NAIP	18
8.	Modular Course on Statistical Methods for Agricultural Research for the participants of an International M.Sc. Programme for Afghan Nationals on Teaching of Post-Graduate courses in Agronomy Coordinators: Rajender Parsad Eldho Varghese Sukanta Dash.	IASRI, New Delhi	11 March to 03 April 2014	IARI, New Delhi	23

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S.No.	Title	Venue	Date	Sponsored by	No. of Participants
Workshops					
9.	Workshop cum Koha Professional Training under "Strengthening of Digital Library and Information Management" (e-GRANTH) Coordinator: Pal Singh	IASRI, New Delhi	11-12 February 2014	NAIP	25
10.	Sensitization Workshop on Internet Protocol Ver. 6 (IPv6) Coordinators: Sudeep, Mukesh Kumar	NASC Complex, New Delhi	27 February 2014	IASRI, New Delhi	110
11.	Training workshop on Computer Assisted Text Analysis under "Mapping the Cultural Authority of Science across Europe and India (MACAS-EU & INDIA). Coordinator: KN Singh	IASRI, New Delhi	27-29 March 2014	Indian Council of Social Science Research (ICSSR),	18

AWARDS AND RECOGNITIONS

- Dr. Arpan Bhowmik received the IARI Merit Medal for his Ph.D. research work during 52nd Convocation of PG School IARI on 21 February 2014.

- Dr Tauqueer Ahmad and Dr. Sudeep received Appreciation Letter from Dean, PG School, IARI, New Delhi for excellent teaching in the discipline of Agricultural Statistics and Computer Application respectively.
- Dr. Anil Rai received Team Award from Indian Society of Agricultural Engineering for significant contribution in "Assessment of Harvest and Post-Harvest Losses of Major Crops and Livestock Produce in India" on February 22, 2014.

- 16th Annual Conference of the Society of Statistics, Computer and Applications at Bhagat Phool Singh Mahila Vishwavidyala, Sonepat, during February 24-26, 2014.
  - Dr. UC Sud: Plenary speaker.
  - Dr. Rajender Parsad: Plenary speaker and Chaired a session of Special Invited Lectures.
  - Dr. Krishan Lal: Chaired a session of contributed papers.
  - Dr. LM Bhar and Dr. Susheel Kumar Sarkar: Convened a session on "Some Considerations in Experimental Designs and their Applications."
  - Dr Hukum Chandra: Convened a session on "Survey Sampling for Policy Planning" and Chaired a session of contributed papers.
  - Dr. Alka Arora: Convened a session on "Statistical and Informatics Issues in Women Empowerment in Agriculture".
  - Dr. Anshu Bharadwaj: Convened a session on "Geoinformatics".

VISIT ABROAD

- Dr. UC Sud visited Paro, Bhutan during 03-15 March 2014 for providing Consultancy on Sampling and Research Methodologies.
- Sh. KK Chaturvedi visited Cornell University, Ithaca, USA during January 28 to April 05, 2014 for receiving training on "Bioinformatics" under the Learning and Capacity Building project of NAIP.

NEW PROJECT INITIATED

- Development of a Tool for Comparision of Protein 3D Structure using Graph Theoretic Approach. (UB Angadi, KK Chaturvedi, Monendra Grover and Sudhir Srivastava: 18.03.2014 to 31.01.2017)
- Multilabel Functional Classification of Abiotic Stress Related Proteins in Poaceae. (Monendra Grover, UB Angadi and Sudhir Srivastava: 20.03.2014 to14.08.201)

PANORAMA OF ACTIVITIES

- The 15th meeting of the Research Advisory Committee (RAC) of IASRI was organized on January 28, 2014 under the Chairmanship of Professor Bimal K. Roy, Director, Indian Statistical Institute, Kolkata. The meeting was attended by Dr. Saumyadipta Pyne, PC Mahalanobis Chair Professor, CR Rao Advanced Institute of Mathematics, Statistics and Computer Science, Hyderabad; Dr. SD Sharma, Former Director, IASRI, New Delhi and Vice-Chancellor, Dev Sanskriti Vishwavidalaya, Haridwar; Dr. Bal BPS Goel, Former Director, IASRI, New Delhi; Shri GC Manna, Deputy Director General (ESD); Central Statistical Office, MOS&PI, New Delhi; Dr. Kanchan K Singh, ADG (Engg.), ICAR, New Delhi; Dr. UC Sud, Director (A), IASRI, as members of RAC of the Institute and Dr. Seema Jaggi, Principal Scientist and Incharge, PME Cell, IASRI as Member Secretary RAC. Dr. VK Gupta, National Professor, ICAR; Dr. Prajneshu, Emeritus Scientist and Former Head, Statistical Genetics, IASRI; Dr. RC Goyal, Emeritus Scientist and Former Principal Scientist, IASRI and all Heads of Divisions, All Professors of IASRI also attended the meeting as special invitees.

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- 80th meeting of the Institute Research Committee (IRC) was organized during March 21-22, 2014 under the chairmanship of Dr. UC Sud, Director(A), IASRI. 09 new research projects (03 Institute funded and 06 outside funded) were approved and progress of 49 on-going research projects (23 Institute funded, 08 in collaboration with other Institute and 18 outside funded) were reviewed and 07 research projects were declared as complete during the meeting. Dr. Seema Jaggi, Principal Scientist and Incharge PME Cell was the Member Secretary.

Distinguished Visitor

- Prof. Martin Bauer from London School of Economics visited the Institute during 26-31 March 2014 under "Mapping the Cultural Authority of Science across Europe and India (MACAS-EU & INDIA)" collaborative project.

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 Completion	02
	New Proposal	01
	Foreign Training	02
Student	Course	09
	ORW	13
	Thesis	07
Total		**34**

PUBLICATIONS

Research Papers

- Arivalagan, M, Bhardwaj, R, Gangopadhyay, KK, Prasad, TV, and Sarkar, SK (2013). Mineral composition and their genetic variability analysis in eggplant (Solanum melongena L.) germplasm. *J. Applied Botany and Food Quality*, **86**, 99 – 103.
- Biswas, Ankur, Ahmad, Tauqueer and Rai, Anil (2013). Variance estimation using jackknife method in ranked set sampling under finite population framework. *J. Ind. Soc. Agril. Statist.,* **67(3)**, 345-353.
- Chambers, R, Chandra, H, Salvati, N and Tzavidis, N (2013). Outlier robust small area estimation. *J. Royal Statist. Soc.*, Series B, **76 (1)**, 47-69.
- Das, TK, Paul, AK and Yaduraju, NT (2013). Density-effect and economic threshold of purple nutsedge (Cyperus rotundus) in soybean. *J. Pest. Sci.*, **87(1)**, 211-220.
- Grover, M (2014). Brassinosteroid synthesis as context sensitive language acceptance problem. *Int J Comp. Sci. Engg.,* **6,** 118-120.
- Gupta, AK, Sud, UC, Chandra, H and Jain, VK (2013). Survey methodology for estimation of mushroom production. *Int. J. Agril Statist. Sci.*, **9(2)**, 555-562.
- Keshri, V, Singh, Dhananjaya P, Prabha, R, Rai, A, Sharma, AK (2014) . Genome subtraction for the identification of potential antimicrobial targets in *Xanthomonas oryzae pv. oryzae* PXO99A pathogenic to rice, *3 Biotech*, **4**, 91–95.

- Kumar, A, Mishra, DC, Rai, A, Sharma, MK and Gajula, MNVP (2013). In-silico analysis of protein-protein interaction between resistance and virulance protein during leaf rust disease in wheat (*Triticum aestivum L.*). *World Res. J. Pept. Protein,* **2(1)**, 52-58.
- Lal, SB, Sharma, A, Chandra, H and Rai, A (2014). Web Based sample selection for survey data. *J. Ind. Soc. Agril. Statist.,* **68(1)**, 101-108.
- Mandal, BN, Gupta, VK and Parsad, Rajender (2014). Construction of efficient multi-level k-circulant supersaturated design. *Communications in Statistics.: Theory & Methods*, **43**, 599-615.
- Meher, PK, Sahu, TK, Rao, AR and Wahi, SD (2014). Application of Gibbs sampling methodology for identification of transcription factor binding sites in MADS box family genes in Arabidopsis thaliana. *Ind. J. Genet*., **74(1)**, 73-80.
- Paul, AK, Alam, Wasi and Paul, Ranjit Kumar (2013). Effect of non-normality and in-admissible estimates on estimation of heritability. *Ind. J. Anim. Sci.,* **83(12),** 114-116.
- Paul, Ranjit Kumar, Panwar, Sanjeev, Sarkar, Susheel Kumar, Kumar, Anil, Singh, KN, Farooqi, Samir and Choudhary, Vipin Kumar (2013). Modelling and forecasting of meat exports from India. *Agril. Eco. Res. Rev.*, **26(2)**, 249-255.
- Ranganath, HK, Prajneshu and Ghosh, Himadri (2014). Descriptive statistics for symbolic interval-valued data. *Ind. J. Ag. Sci.*, **84**, 424-427.
- Sarika, Iquebal, MA, Rai, Anil and Anshika (2012). Support vector machine for prediction of antimicrobial peptides in legumes. *Int. J. Agril. Statist. Sci.*, **9 (2)**, 717-728.
- Varghese, Eldho, Jaggi, Seema and Varghese, Cini (2014). Neighbour balanced row-column designs. *Communications in Statistics: Theory & Methods,* **43(6)**, 1261-1276.

Leaflets/Brochure

- Choubey, AK, Sudeep, Kumar, Mukesh, Rao, N Srinivasa (2014). Migration from IPv4 to IPv6 in DARE/ICAR. *Brochure.*
- Iquebal, MA, Sarika, Arora, Vasu, Verma, Nidhi, Rai, Anil and Kumar, Dinesh (2013). World's first database based on tomato whole genome for gene mapping and variety identification. Also available at *http://cabindb.iasri.res.in/tomsatdb*
- Iquebal, MA, Sarika, Dhanda, Sandeep K, Arora, Vasu, Dixit, SP, Raghava, GPS, Rai, Anil and Kumar, Dinesh (2013). First webserver for goat breed identification using molecular data. Also available at *http://cabin.iasri.res.in/gomi*
- Iquebal, MA, Sarika, Rai, Anil and Kumar, Dinesh. Web Server for Breed Identification using Microsatellite DNA Markers: BIS-Cattle. Also available at *http://cabin.iasri.res.in/biscattle*
- Sarika, Arora, Vasu, Iquebal, MA, Rai, Anil and Kumar, Dinesh (2013). Microsatellite markers from whole genome sequence of water buffalo (Bubalus bubalis) for gene mapping. Also available at *http://cabindb.iasri.res.in/buffsatdb*
- Sarika, Arora, Vasu, Iquebal, MA, Rai, Anil and Kumar, Dinesh (2013). Whole genome pigeonpea microsatellite database and primer generation tool. Also available at *http://cabindb.iasri.res.in/pigeonpea*
- Sarika, Iquebal, MA, Rai, Anil and Kumar, Dinesh. Kritrim neural network karyapranali aadharit DNA microsatellite marker dwara nasl pahchan ki vidhi. Also available at *http://cabin.iasri.res.in/bisgoat*

Book Chapter

- Following notes as chapters have been published in the edited book *Extension Education: A Handbook,* Vol. II (2014) under Module XIV: Statistics and Computer Application published by Post Graduate School, IARI, ISBN: 978-93-83168-12-5. (Eds. Premlata Singh, JP Sharma, RR Burman, NV Kumbhare and Sujit Sarkar):
  - Dahiya, Shashi, Bhardwaj, Anshu. Computer Applications for Social Sciences. 457-461.
  - Jaggi, Seema and Varghese, Cini. Descriptive Statistics. 377-385.
  - Jaggi, Seema. SPSS: An Overview. 386-394.
  - Jaggi, Seema, Varghese, Eldho and Bhowmik, Arpan. Practical on Descriptive Statistics, Correlation and Regression Analysis Using SPSS. 395-401.
  - Jaggi, Seema. Testing of Hypothesis. 402-412.
  - Jaggi, Seema and Varghese, Eldho. Practical on Testing of Hypothesis using SPSS. 413-421.
  - Jaggi, Seema and Bhowmik, Arpan. SPSS Graphics. 432-449.
  - Varghese, Eldho and Varghese, Cini. Nonparametric Tests. 422-431.
  - Varghese, Cini. MS- Excel: Statistical Procedures. 363-376.

Popular Article

- Sahoo, RN, Biswas, A , Singh, GP, Gupta, VK and Singh, R (2014). New initiatives on Wheat genotypes discrimination through Hyperspectral Remote Sensing. *ICAR News*, **20(1)**, 5.

Reference Manual

- Computational aspect for NGS data analysis: a sojourn from lab to field (2014, Eds. Iquebal, MA, Joshi, Chaitanya G, Sarika, Rai, Anil and Kumar, Dinesh).

Papers in Conferenc Proceedings

- Chaturvedi, KK, Bedi, Punam, Misra, Sanjay and Singh, VB (2013). An empirical validation of the complexity of code changes and bugs in predicting the release time of open source software. *Proceedings of 16th IEEE International Conference on Computational Science and Engineering held at University of Sydney, Australia during December 03-05, 2013, 1201-1206. IEEE Computer Society.*
- Das, Suvajit, Dahiya, Shashi, Bharadwaj, Anshu (2014). An online software for decision tree classification and visualization using C4.5 algorithm (ODTC). *8th INDIACom; 2014 International Conference on Computing for Sustainable Global Development, New Delhi, (Eds: M.N. Hoda,* ISBN: 978-93-93-80544-10-6), 1103-1106.
- Singh, Pal, Sudeep, Arora, Alka, Goyal, RC and Malhotra, PK (2014). Project information & management system of ICAR (PIMS-ICAR). *8th INDIACom; 2014 International Conference on Computing for Sustainable Global Development, New Delhi, (Eds: M.N. Hoda,* ISBN: 978-93-93-80544-10-6), 474-476.

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INVITED LECTURES DELIVERED

- Training programme on Price Forecasting Using SAS Software to train the researchers working on Network Project on Market Intelligence organized by NCAP, New Delhi during January 03-04, 2014
  - Parsad, Rajender. SAS: An overview.
  - Paul, RK. i) ARIMA Models and ii) Demonstration of ARCH/GARCH model using a case study.
- Workshop cum Hands-on-Training on Use of Bioinformatics in Crop Biotechnology organized at Department of Genetics and Plant Breeding, Ch. Charan Singh University, Meerut, UP during January 06-08, 2014.
  - Rao, AR. Application of R-Package for crop bioinformatics.
  - Meher, PK. R-Packages for bioinformatics.
- International training programme for officers of ASEAN Members Nations 'IT Application for Agricultural Extension (e-Extension)' organized during January 06-18, 2014 at NAARM, Hyderabad.
  - Sudeep. Information systems for agricultural extension in India.
- CAFT programme on Markets, Trade and Institutions for Agricultural Development during January 27 – February 16, 2014 in the Agricultural Economics division of IARI, New Delhi.
  - Jaggi, Seema. SPSS: An Overview and SPSS for Regression Analysis.
- Training programme on R-biological computing and applications organised at Institute of Bioresources and Sustainable Development, Imphal, Manipur during March 14-15, 2014.
  - Chandra, Hukum. i) An Introduction to R Software, ii) R Graphics, iii) Import and Export of Data in R, iv) Statistical Analysis Using R and v) R Functions.
- Training programme organized by NDRI, Karnal at SKUAST-Jammu during March 17-22, 2014.
  - Parsad, Rajender. Indian NARS statistical computing portal and design resources server. The lecture was delivered through Google Hangouts.
- DBT funded Workshop Cum Training programme on Computational Techniques for Biological Data Mining organised at Agricultural Knowledge Management Unit (AKMU), IARI, New Delhi on March 26, 2014.
  - Sarika. STR markers and its application in Agriculture.

PAPERS PRESENTED

- AICTE sponsored International Conference on Computing, Informatics and Networks at Delhi during January 03-04, 2014
  - Bharadwaj, Anshu. Inductive-analytical learning based stepwise support vector machine (SVM).
- International Conference on Biotechnology and Bioinformatics (ICBB-2014) held at Pune, India during February 01-02, 2014
  - Meher, PK*, Rao, AR, Sahu, TK and Wahi, SD. Eukaryotic donor splice site prediction using Neural Networks.
- 101st Indian Science Congress at University of Jammu, Jammu during February 03-07, 2014.
  - Bhowmik, Arpan. Optimal block designs under a non-additive two-sided interference effects model [Paper presented in the ISCA young scientist award programme under Mathematical science including Statistics section]

- 3rd International Plant Phenotyping Symposium organized by MS Swaminathan Research Foundation, Chennai during February 17-19, 2014.
  - Angadi, UB. Initiative of ASHOKA in Indian Agriculture Research. (invited talk)
  - Sudeep. Visual image analysis for assessment of plant pigments and leaf area index in rice under pot culture condition.
- International Soybean Research Conference (SOYCON-2014) organized from 22-24 February 2014 at Indore.
  - Arora, Alka* and Jain, Rajni. Machine Learning for Diagnosis of Soybean Diseases.
- 16th Annual Conference of Society of Statistics, Computer and Applications held at Bhagat Phool Singh Mahila Vishwavidyalaya (BPSMV), Khanpur Kalan, Sonepat, Haryana, during February 24-26, 2014.
  - Ahuja, Sangeeta. Statistical software package for performance ensemble of compound treatments in agroforestry research (PECTAR 1.0).
  - Arora, Alka. ICAR-ERP solution for resource and financial management. (invited paper)
  - Arya, Prawin*, Singh, DR, Singh, KN and Kumar, Anil. Equity analysis in crop production in North-Western Rajasthan
  - Bharadwaj, Anshu*. Geostatistics and statistics data mining in agriculture.
  - Chandra, H*, Basak, P and Sud, UC. Estimation of finite population total for skewed data. (Invited paper)
  - Dahiya, Shashi. Ontologies and semantic web in geoinformatics. (invited paper)
  - Dash, Sukanta *, Parsad, Rajender and Gupta, VK. Efficient row-column designs for mixed level factorial experiments based on baseline parameterization.
  - Farooqi, Samir*. Functional classification of genes using synonymous codon usage data of S. ruber. (invited talk)
  - Gurung, Bishal*. Statistical modelling for describing all-India rainfall through logistic smooth transition autoregressive (LSTAR) model.
  - Lal, SB*, Rai, A, Sharma, A, Chaturvedi, KK and Angadi, UB (2014). Accelerating biological data processing using parallel computing.
  - Mishra, DC. Gene regulatory network analysis using partial least square (PLS) regression approach.
  - Parsad, Rajender* and Gupta, VK. Web resources for research and dissemination in statistical sciences. (plenary talk).
  - Paul, RK. Forecasting spot price of mustard in Mumbai using ARFIMA model.
  - Sarkar, Susheel Kumar*, Lal, Krishan and Gupta, VK. Cost efficient linear trend-free multi-level factorial experiments. (invited talk)
  - Sud, UC. Calibration estimators in survey sampling. (plenary talk)
  - Sudeep. MIS tool for managing academic activities of a university. (invited paper)
  - Sudeep. ICT initiatives for human resources development in agricultural education. (invited paper)
  - Yadav, SK, Lal, Krishan*, Parsad, Rajender and Gupta, VK. Robust 2^k factorial experiments with logistic error distribution. (invited talk)

- National Conference on Science of Omics for Agricultural Productivity: Future Perspectives at G.B Pant University of Agriculture & Technology, Pantnagar (Uttarkhand) during March 04-06, 2014.
  - Angadi, UB. Initiative of ASHOKA in Indian Agriculture Bioinformatics Research (invited talk)
- Workshop-cum Training on Computational Techniques for Biological Data Mining at USI, IARI, New Delhi on March 24, 2014.
  - Rai, Anil. National Agricultural Bioinformatics Grid. (key note address)
- NAIP-NABG Workshop on Bioinformatics Assisted Biological Research: Microbial Perspective during March 24-25, 2014 at NBAIM, Mau.
  - Kumar, Sanjeev. Microbial bioinformatics: A systems biology perspective. (invited talk)
  - Kumar, Dinesh. Domestic animal ruminant metagenomics: A gold mine for new genomic resources. (Invited talk)
- International Symposium on Plant Signaling and Behaviour at Delhi University
  - Grover, Monendra. Heat stress signaling in plants as context sensitive language acceptance problem. (poster)

Participation

Conferences / Workshops / Trainings/ Seminars / Symposia etc.

- ICAR Vice Chancellors' and Directors' Conference from January 19-20, 2014 at Pune. A presentation on Internet Protocol Version 6 (IPv) was also made. (Dr. UC Sud and Dr. AK Chaubey)
- 2nd Annual Conference on Normalizing India-Pakistan Trade' during January 21-22, 2014 at IHC, New Delhi. (Dr. Sushila Kaul)
- Asia-Africa Agribusiness Forum – An International Conference, New Delhi during February 04-06, 2014. (Dr. UC Sud and Dr Hukum Chandra)
- Five days training entitled "Linux and HPC" organized by Hewlett-Packard Education Services scheduled during February 17–21, 2014 at IASRI, New Delhi (Scientists of CABin)
- All India Training Workshop for 5th Minor Irrigation Census held at CSMRS, New Delhi on February 25, 2014, organized by Ministry of Water Resources, Govt. of India. (Dr Tauqueer Ahmad)
- Three days training entitled "PBS Professional Training" organized by Hewlett-Packard Education Services during March 05-07, 2014 at IASRI, New Delhi. (Scientists of CABin)
- Workshop on "Introduction to BioHPC" on February 19, 2014 and "Linux for Biologists" on March 10 & 17, 2014 at Institute of Biotechnology, Cornell University, Ithaca, NY, USA. (Sh. KK Chaturvedi)
- Workshop on "Managing agricultural price risk: implication for India" held at NCAP, New Delhi on March 19, 2014. (Dr Ranjit Kumar Paul)
- NISAGEnet workshop organized at MPKV, Rahuri, Maharashtra during March 19-20, 2014. (Dr. Alka Arora)
- Workshop on "Logistic Regression for Response with More Than Two Categories" on March 26, 2014 at Cornell Statistical Consulting Unit (CSCU), Cornell University , Ithaca, NY, USA. (Sh. KK Chaturvedi)
- Workshop on "Agricultural Research Connections" on March 27, 2014 at College of Agriculture and Life Sciences (CALS), Cornell University , Ithaca, NY, USA. (Sh. KK Chaturvedi)
- Workshop on Improving Effectiveness of Acceptance Testing in ICT projects organized by DEFT education and learning institute at IHC, New Delhi during March 27-28, 2014. (Dr. N Srinivasa Rao)

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Meetings

- Second meeting of the Technical Committee on Sampling and Methods of Analysis of Imported Fertilisers held on January 21, 2014 at KAB-II, New Delhi under the Chairmanship of Dr A.K. Sikka, DDG (NRM). (Dr. UC Sud, Dr. KK Tyagi and Dr. Tauqueer Ahmad)
- Special meeting organised for discussing a new collaborative project with IASRI and Ministry of Tribal Affairs with Dr. Shieladitya, Deputy Director General, Ministry of Tribal Affairs and Dr. Namita Pridarshi, Director Ministry of Tribal Affairs on January 30, 2014. (Dr. UC Sud and Dr. Hukum Chandra)
- Meeting with Dr CR Mehta, Project Coordinator, FIM, CIAE, to discuss sampling plan and other related issue about the mechanization survey being planned by FIM Scheme on January 31, 2014. (Dr. KK Tyagi and Dr. Hukum Chandra)
- 64th meeting of the National Statistical Commission on February 17, 2014 at Sardar Patel Bhawan, New Delhi. (Dr. UC Sud)
- Meeting of the Sub-committee on Agriculture and Allied Sectors held under the chairman of Prof Mahendra Dev at CSO, Sardar Patel Bhawan in which Dr T Ahmad made a presentation on the new project proposal 'Study to test the developed alternatives methods for estimation of area and production of horticultural crops' on February 18, 2014. (Dr. KK Tyagi and Dr. Tauqueer Ahmad)
- Meeting under the Chairmanship of Sh. DK Jain, Additional Secretary (Horticulture) held at Krishi Bhawan on February 20, 2014 to discuss the project proposal entitled "Study to test the developed alternative methodology for estimation of area and production of horticultural crops" for its approval and funding. (Dr. Tauqueer Ahmad)
- Meeting with DDG (Statistics), Ministry of Tribal Affairs, Govt. of India, at IASRI, New Delhi on February 21, 2014. (Dr. Hukum Chandra)
- 7th High Level Committee meeting on the socio-economic, health and educational status of the tribal communities of India, Ministry of Tribal Affairs, Govt of India, New Delhi on February 27, 2014. (Dr. Hukum Chandra)
- Meeting with Under Secretary, Mr. VK Singh regarding IPv6 implementation at DARE/ICAR. (Dr. Sudeep)
- Meeting with World Bank Officials for clarifying the query and getting the approval of Bank for ICB on ICT Infrastructure and Unified Messaging & web Hosting Solution in ICAR under MIS/FMS Project. (Dr. AK Choubey)
- RAC of National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI), Bangalore held on March 01, 2014. (Dr. Anil Rai)
- Meeting concerning Breed Survey organised by Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture at Krishi Bhavan, New Delhi on March 05, 2014. (Dr. KK Tyagi)
- Coordination Committee Meeting of AICRP on PHT held on March 08, 2014 at CIPHET, Ludhiana under the Chairmanship of Joint Secretary, Ministry of Food Processing Industries (MoFPI), Govt. of India. (Dr Tauqueer Ahmad)
- Meeting on "Big Data Solutions" with Hewlett Packard on March 20, 2014 held at IASRI, New Delhi. (Dr. Anil Rai, Dr. DC Misra, Sh. Sanjeev Kumar, Dr. Dinesh Kumar, Sh. SB Lal and Sh. Sudhir Srivastava)
- Monitoring committee meetings for audit of assets and applications developed under NAIP project - ASRB online examination system. (Dr. AK Choubey)

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CONSULTANCY /ADVISORY SERVICES PROVIDED

- Dr. Rajender Parsad was invited as Expert in Brainstorming Session on Experimental Designs for Coordinated Wheat and Barley Trials held at DWR, Karnal on January 16, 2014. The discussions were held on i) Layout for AVTs when entries exceed 20; ii) Suitability of currently followed simple lattice designs in NIVTs ; iii) Setting a limit for acceptance of data from centres with low CV; iv) Identifying the correct procedure for pooling of results and v) Evolving appropriate promotion criteria for entries in trials. In this session, this has been decided that if entries are more than 20, then the experiment should be conducted using alpha lattice design and adjusted mean should be used for interpretation. Analysis of covariance should be used by taking plant stand as covariate in data analysis of salinity/alkalinity trials. Further, varieties which are significantly superior at 10% level of significance in NIVTs/IVTs and at 5% level of significance in AVTs with the best check of the trial are only to be considered for retention/ promotion.
- Dr. Rajender Parsad advised i) Dr. Aravind K Jukanti, Senior Scientist, CAZRI, Jodhpur on the analysis of data generated from an augmented randomized complete block design with 140 test and 5 check entries arranged in 7 blocks each of size 25. Also advised on obtaining genotypic variance-covarinace, phenotypic variance-covariance, heritability and genetic advance and ii) Dr. Dinesh Kumar, Senior Scientist, Division of Agronomy, IARI, New Delhi for performing multiple comparison procedures using SAS in case of a two-factor factorial randomized complete block design.
- Dr Hukum Chandra advised Professor R.M. Pandey, Head, Department of Biostatistics and Ms. Mona Pathak, All India Institute of Medical Sciences, New Delhi on methodological issue on application of small area estimation in health survey data on January 03, 2014. He also advised Dr. Anil Kumar Gore, Public Health Foundation of India, New Delhi at IASRI on methodological issue on application of small area estimation in DLH and NFS data of the State of Uttar Pradesh on February 07, 2014.
- Dr KK Tyagi provided advisory guidance to Dr CR Mehta, Project Coordinator, AICRP on FIM concerning a sample survey on agricultural mechanization on January 31, 2014.
- Dr. RK Paul provided advisory to Professor M.H. Wani, Rajiv Gandhi Chair, SKUAST-K and his team regarding price forecasting of fruits and vegetables.
- Dr. Krishan Lal provided consultancy to a Ph. D. (Agronomy) student of IARI, New Delhi for combined analysis of data of split plot designs. The data were for the two years with four main plots and four sub-plots with three replications.
- Dr. Susheel Kumar Sarkar provided consultancy to a Ph. D. (floriculture) student of IARI, New Delhi regarding analysis of data. The data were for the two years with open and protected environments with three replications. He also advised Dr. Mukesh Kumar Sehgal, NCIPM on suitable statistical procedure for establishing relationship between nematode population and different soil parameters. Also provided advisory to Dr. Sumitra Arora, Principal Scientist, NCIPM, New Delhi for evaluation of different modules under IPM and NONIPM methods.
- Dr. Seema Jaggi and Dr. Eldho Varghese advised Dr. Charanjit Kaur, Professor, Division of Post-Harvest Technology, IARI to use Box-Behenken design for an experiment on Multigrain Pasta, where the input variables are three different grains taken at three different levels and provided a randomized layout of the suggested design.

- Dr. Arpan Bhowmik advised Mr. Sujit Sarkar, a scientist from division of Agricultural Extension, IARI on the use of principal component analysis to work out Vulnerability index to assess and analyze farmers' vulnerability to climate change in Himachal Pradesh and Rajasthan by considering various dimensions of individual (attitudinal, knowledge, skill, value orientation) as well as social (interconnectedness and cohesiveness), Economic (physical resources) and Behavioural (innovativeness, risk orientation, achievement motivation, production orientation etc.).
- Dr. Eldho Varghese advised Dr. Bhupender Kumar, Scientist from DMR on the use of discriminant analysis for finding the misclassification rate of genotypes into five different zones.
- Dr Sukanta Dash advised Dr. Kiran Gaikwad, Scientist, IARI, New Delhi in the division of Genetics on the use of multivariate techniques for analyzing 10 characters and 112 data points of wheat variety (HD-2894) and gave interpretation on the result obtained. Dr. Sunita Singh, Principal scientist, IARI in the division of Post Harvest Technology, IARI, New Delhi was advised on response surface method to optimize the response of Nisin on 3 levels of 9 response variables in 15 runs.
- Dr KK Tyagi and Dr T Ahmad made a visit to the Kandla Port, Gandhidham (Gujarat) and JNPT, Mumbai (Maharashtra) for understanding the downloading procedure of fertilizer from the ships at Ports regarding suggesting appropriate sampling procedure concerning drawing of samples of fertilisers during 22-24 February, 2014.

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PERSONNEL

Congratulations on your Promotion

Name	Designation	Effective Date
Dr. Ashok Kumar Gupta	Principal Scientist	01.01.2012
Dr. Amrit Kumar Paul	Principal Scientist	27.11.2012
Dr. Tauqeer Ahmad	Principal Scientist	29.11.2012
Dr. A Ramakrishna Rao	Principal Scientist	05.12.2012
Dr. Himadri Ghosh	Principal Scientist	26.02.2013
Sh. SC Pandey	Chief Technical Officer	19.12.2013
Smt. Meena Nanda	Chief Technical Officer	19.12.2013
Smt. Neelam Malhotra	Chief Technical Officer	19.12.2013
Sh. Naresh Kumar	Chief Technical Officer	19.12.2013
Sh. AK Sondhi (Retired)	Chief Technical Officer	19.12.2013
Sh. MM Maurya	Sr. Technical Officer	04.02.2014
Smt. Usha Jain	Sr. Technical Officer	01.01.2013
Sh. Dinesh Kumar Rai	Sr. Technician	05.02.2014

Wish you Happy Retired Life

Name	Designation	Effective Date
Smt. Jaswanti	SSS	31.01.2014
Sh. Raj Nandan Mahto	SSS	31.01.2014
Sh. Shiv Shankar Sah	SSS	31.01.2014
Sh. Ram Naresh Yadav	Electrician	31.01.2014
Dr. Krishan Lal	Principal Scientist	31.03.2014
Dr. (Smt.) Sushila Kaul	Principal Scientist	31.03.2014
Smt. Kamlesh Vij	Private Secretary	31.03.2014

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