



# ICAR-IASRI



Volume 21

No. 1

## NEWS

April-June, 2016

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



### From Director's Desk . . .

This newsletter highlights salient research achievements, training programmes and workshops organized and other significant activities performed at the Institute during the period under report.

An attempt has been made to develop computational (probabilistic and machine learning) approaches for the prediction of donor splice sites in eukaryotic species. Based on the developed approaches, three web servers viz., dSSpred (<http://cabgrid.res.in:8080/sspred>), PreDOSS (<http://cabgrid.res.in:8080/predoss>) and HSplice (<http://cabgrid.res.in:8080/hsplice>) have been developed for the prediction of donor splice sites. The developed web servers will be of great help for the biological community for easy prediction of donor splice sites.

Small Area Estimation (SAE) techniques has been used on the All-India Debt and Investment Survey (AIDIS) data to produce estimates as well as spatial maps of incidence of indebtedness at the District level for the state of Uttar Pradesh. These micro estimates and spatial maps are expected to provide invaluable information to policy-analysts and decision-makers for identifying the regions and social groups requiring more attention.

In many practical situations in plant and animal breeding, observations are not independent. Appropriate methodology has been developed for computing heritability estimates under correlated error structure.

Non-sampling errors are common in large scale surveys. To address the problem of non sampling errors in large scale sample surveys and reduce the cost of data collection, an android mobile based application for data collection named MAPI (Mobile Assisted Personal Interview) has been developed. This software is built on android version 4.1 (Jelly Bean) and inbuilt database named Sqlite Database support average models of android mobile phones and tablets. MAPI has built in Eclipse Juno software which generate .apk (android package kit) file for installation as per the device requirement. MAPI is available online at sample survey resource server of ICAR-IASRI, New Delhi at <http://sample.iasri.res.in/ssrs/android.html>. The MAPI software has been employed for collection of data on crop area and production in two districts of the state of Uttar Pradesh namely, Bulandsahar and Pratapgrah during Rabi season 2015-16 under the pilot study.

Four training programmes, three under ICAR-ERP sponsored by ICAR-IASRI, New Delhi and one under ICAR-IASRI Component of CHAMAN Programme under MIDH were organized. One Hindi workshops has also been organized.

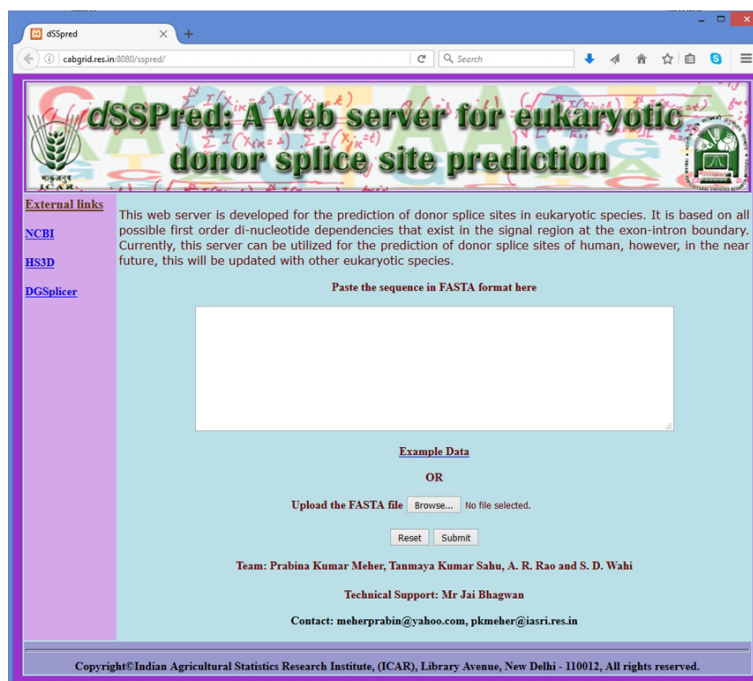
Scientists of the Institute received recognitions and have visited various countries on different assignments. During the period, four new projects were initiated. Scientists of the Institute have published 38 research papers, 03 project reports and one book chapter. Besides, 05 invited lectures were delivered and scientists have participated in different conferences/ symposia/ workshops, etc.

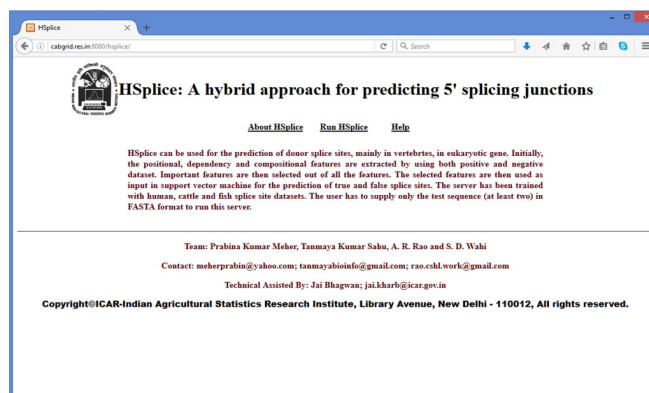
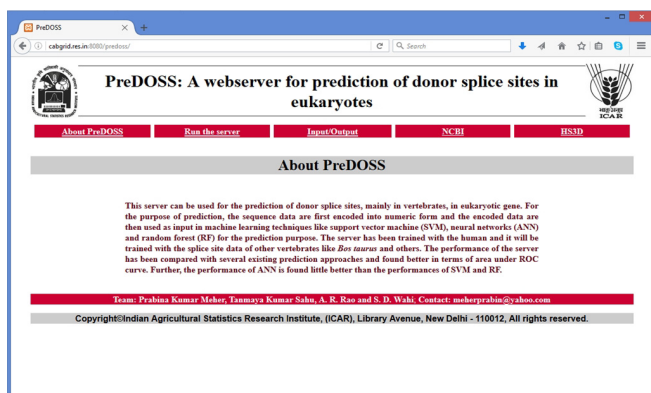
It is hoped that the contents of this document would be informative and useful to scientists in NARES. Any suggestions for improving the contents of the newsletter further would be highly appreciated.

  
(UC Sud)

## RESEARCH ACHIEVEMENTS

- Development of statistical approach for prediction of eukaryotic splice sites.** An attempt was made to develop some computational (probabilistic and machine learning) approaches for the prediction of donor splice sites in eukaryotic species. Initially, the application of statistical techniques like position weight matrix, Pearson's Chi-square, modified Bhattacharya distance, Cramer's V coefficient was explored for determining a suitable window size in rice, maize and barley. In all these species, a window size of 9bp (3bp at the end of exon+6bp at the beginning of intron) was found to be optimum. Further, three computational approaches were developed for the prediction of donor splice sites, among which one is probabilistic approach and other three are machine learning-based approaches. In the probabilistic approach, sum of absolute error was computed for each candidate splice site sequence (vertebrate genome) by taking into account all possible di-nucleotide dependency into account, and the prediction was made based on a threshold value. In this approach, we also proposed a procedure for computing the association among different positions in a position-wise aligned sequence dataset, which was subsequently used to determine the optimum window size of 9bp for prediction of donor splice sites. The developed approach was found to be comparable, compared with short sequence motif based splice site prediction approaches like weighted matrix model, weighted array method, maximal dependency decomposition and maximum entropy model, while compared using an independent test dataset. In the *first* computational approach, the association among the nucleotides of different positions obtained under the probabilistic approach was used to encode the splice site sequence of rice genome. The encoded numeric dataset was further used as input in machine learning classifiers like ANN, SVM and Random Forest. The performance of three approaches was compared with each other, where the Random Forest achieved higher accuracy than that of SVM followed by ANN. In the *second* computational approach, absolute error obtained for each nucleotide at each position (under probabilistic approach) was used to encode the splice site sequence into numeric form, which was further used in ANN, SVM and RF for the prediction of donor splice sites. The performance of the proposed approach was compared with several existing approaches by using an independent test set of 50 genes. The proposed approach was found to achieve an acceptable level of accuracy that will complement the existing approaches. In the *third* computational approach, three different set of features were developed i.e., positional features, compositional features and dependency features. Then, important features were selected using a feature selection approach i.e., F-score and the selected features were used as input in SVM for the prediction of donor splice sites. This approach was tested on four different species i.e., human, fish, bovine and worm, and achieved consistent accuracy over all the species. Based on the developed approaches, three web servers viz., *dSSpred* (<http://cabgrid.res.in:8080/sspred/>), *PreDOSS*

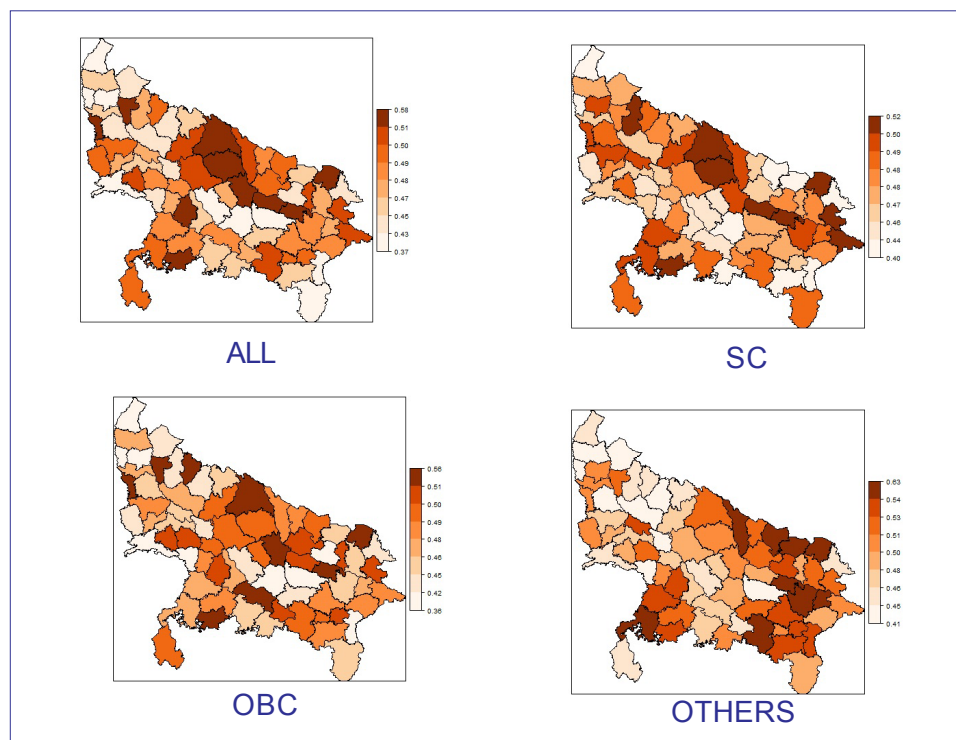




(<http://cabgrid.res.in:8080/predoss>) and *HSplice* (<http://cabgrid.res.in:8080/hsplice>) have also been developed for the prediction of donor splice sites. The developed web servers will be of great help for the biological community for easy prediction of donor splice sites.

**Prabina Kumar Meher\*, AR Rao, SD Wahi and LM Bhar**  
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- Robust and Efficient Small Area Estimation Methods for Agricultural and Socio-Economic Surveys and Their Application in Indo-Gangetic Plain.** The All-India Debt and Investment Survey (AIDIS) is one of the important survey conducted by the National Sample Survey Office (NSSO) at decennial intervals through household interviews from a random, nationally representative sample of households. As part of the 70<sup>th</sup> round survey of NSSO conducted between January and December 2013, the AIDIS 2012-13 was aimed at generating average value of assets, average value of outstanding debt per household and incidence of indebtedness, separately for the rural and urban sectors of the country, for States and Union Territories, and for different socio-economic groups. The AIDIS 2012-13 has been planned to generate statistics at state and national level. There is no flow of estimates at further below level, e.g., at the district or further disaggregate level. The indicators of AIDIS are amongst the most important measures of the indebtedness of the respective domains of the population. The AIDIS survey provides reliable state and national level estimates; they cannot be used to derive reliable direct survey estimates at the district or further disaggregate level owing to small sample sizes which lead to high levels of sampling variability. Our knowledge and understanding of geospatial inequalities and equity in this regard is severely hampered by the lack of local level statistics in resource poor settings. Existing data based on AIDIS survey produces state and nationally representative estimates but they cannot be used directly to produce reliable local area statistics. States/National averages often mask the variations at the local level. The lack of robust and reliable outcome measures at the local level also put constraints for designing targeted interventions and policy development. More importantly, states/national estimates do not adequately capture the extent of geographical inequalities which restricts the scope for evaluating progress locally within and between administrative units. State level and National goals often lead to sub-optimal interventions which are focused on groups or areas that require minimum effort to achieve set thresholds, neglecting critical areas where interventions are most needed and hence increasing inequity. Nonetheless, local goals cannot be set and monitored where baseline information is non-existent as is the case in many low and middle income regions. At the same time it is also true that conducting a survey aimed at this level is going to be very trivial and costly as well as time consuming job. As a consequence, we cannot conduct new survey for producing these local level estimates. We therefore need a special technique to produce estimates at micro or local levels using



District and district by social group class wise incidence of indebtedness in agricultural households for the state of Uttar Pradesh, 2012-13.

the already existing survey data. The small area estimation (SAE) is a viable approach for producing estimates at these levels. We applied SAE techniques to generate reliable disaggregate level estimates and spatial mapping of incidence of indebtedness for agricultural households in the State of Uttar Pradesh. The SAE method uses the AIDIS data of NSSO conducted in 2012-13 and linked with the Population Census 2011 data to produce reliable estimates of incidence of indebtedness (i.e. proportion of indebted household) at the district (All) and district by social group category (ST, SC, OBC, Others) level for rural areas of State of Uttar Pradesh. In Census 2011, looking at the status of ST population, it appeared that in most of the districts ST population is not prevalent. Therefore, estimates are generated for the ST category. The diagnostic measures used for examining the validity and reliability of the generated small area estimates confirm that generated estimates have reasonably good precision. The results clearly indicate that the district-wise (All) and district by social group category wise (SC, OBC, Others) estimates generated by using SAE method are precise and representative. In contrast, the direct survey estimates are very unstable. In many districts due to small sample sizes, it is not possible to produce reliable and valid estimates using sample data alone. The estimates generated using SAE method are still reliable and reasonable for such areas. In recent years, Government of India has launched number of schemes for the benefit of farmers in the country. These micro estimates as well as spatial maps of incidence of indebtedness are expected to provide invaluable information to policy-analysts and decision-makers for identifying the regions and social groups requiring more attention.

- **Estimation of Heritability Under Correlated Errors.** In many practical situations in plant and animal breeding, observations are not independent. There is always some kind of correlation present among the observations. In the presence of significantly correlated trends in the data, the classical assumption of independence between observations is violated. Further in mixed models, in addition to comparison of fixed effects the prime interest of plant and animal breeders is to have information on the genetic components of the variances of the important characters. In case of full sib model, an appropriate expression for deriving expected value of mean square error and hence estimation of heritability in presence of AR(1) correlated error structure has been obtained. It has been found through a simulation study that the expected mean sum of squares due to error is overestimated when the correlation  $\rho$  (say) is negative and it increases with the increase of  $\rho$ . But expected mean sum of squares is underestimated if errors are positively correlated. It decreases with increase of degree of correlation. It approaches to 0 as  $\rho$  tends to unity. On the other hand, just reverse results are obtained for estimating the mean sum of squares due to sire, i.e., expected mean sum of squares is under estimated when  $\rho$  is negative and is overestimated if the correlation is positive. As  $\rho$  tends to unity, expected mean sum of squares due to sire approaches to its maximum value. Heritability values are over estimated if the correlation is positive. The same trend follows for all the level of heritability. Also heritability increases from zero to nearly four as autoregressive coefficients increase from minus unity to approximate unity. Value of estimates of heritability changes negative to positive when  $\rho$  changes from -1 to +1. MSE value decreasing up to  $\rho = 0$ , then again increasing when  $\rho$  is positive. Up to  $\rho = -1$  to  $\rho = -0.5$  the estimate of heritability is 0 in case of ML, REML and MIVQUE methods and MSE values are not changed. Estimated values of heritability are increasing from  $\rho = -0.4$  to  $\rho = 1$ . MSE values are showing the same trend. By increasing sample sizes it is noticed that the MSE values are decreasing. In case of AR(2), if fixing AR(1) value AR(2) values are changed, the MSE value decreases with increasing value of correlation in general. Sometimes haphazard trends are noticed. It is found that some good combination of AR(1) and AR(2) values viz., (0, 0), (0.1, 0.1) and (0.1, 0.5) combinations are giving better estimates of heritability. By increasing sample sizes it is noticed that the MSE values are decreasing. In almost all cases biased estimates are obtained. Estimates for considering only sire components are better than considering sire and dam component and dam component alone. Under fixed effect also after changing correlation AR(1) from -1 to +1 with increment 0.5, it is noticed that MSE values decreases with increase of AR(1) correlations. In almost all the cases highly biased estimates of heritability are obtained. Again estimates for considering only sire components are better than considering sire and dam component and dam component alone. The combination of correlation i.e. (0, -0.5) and (0, 0.5) gives better results than any other combination. Increasing sample size decrease the MSE values.

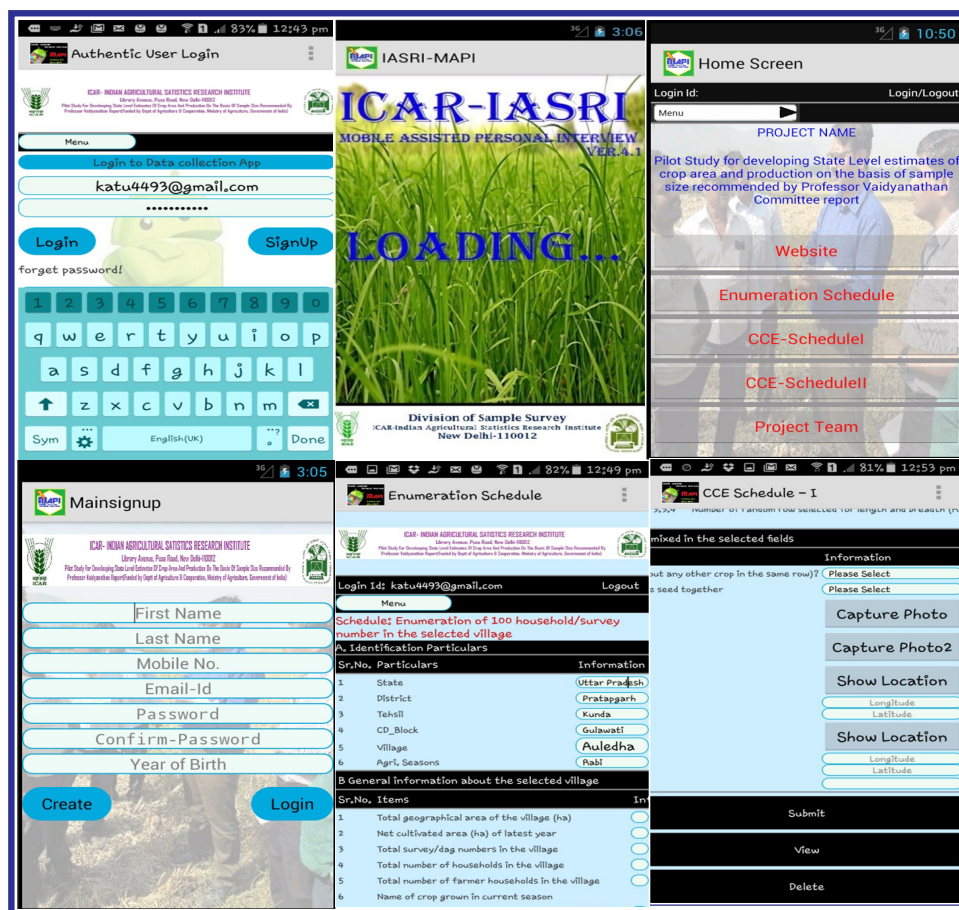
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- **Mobile Assisted Personal Interview Software (MAPI).** The need for timely, reliable and comprehensive statistics on crop area and production assumes special significance in view of the vital role played by the Agricultural Sector in the Indian Economy. To collect data on crop area and production various large scale surveys are conducted by the Ministry of Agriculture and Farmers Welfare and National Sample Survey Office, Ministry of Statistics and Programme Implementation, every year which incur a huge cost. Further, in large scale surveys conducted for collection of the field level primary data, the data quality is declining due to various types of non-sampling errors arising out of data collection, tabulation and data cleaning stage. To tackle these problems and reduce the cost of data collection, ICAR- Indian Agricultural Statistics Research Institute (ICAR-IASRI), New Delhi team under the project entitled "Pilot study for developing state level estimates of crop area and production on the basis of sample sizes

recommended by professor Vaidyanathan committee report (funded by Department of Agriculture & Cooperation, Ministry of Agriculture and Farmers Welfare, Government of India)", have developed an Android Mobile Based Application for Data Collection which is compatible with all the Android smart phones. This software is built in android version 4.1(Jelly Bean) and inbuilt database support named Sqlite Database which support average models of android mobile phones and tablets. MAPI has built in Eclipse Juno software which generate.apk (android package kit) file for installation as per the device requirement and based on JAVA platform which makes it very easy to modify. The software does not requires a lot of storage space or memory of the device which make it run faster.

The Mobile Assisted Personal Interview(MAPI) software has been developed to collect the data on crop area, yield, production and other demographic and social information as per the requirement of the pilot study and is available online at sample survey resource server of ICAR-IASRI, New Delhi at <http://sample.iasri.res.in/ssrs/android.html>. For other customized surveys the developed software can be modified based on the request of the registered user. The MAPI software has many advantages than the other softwares available online for the purpose of data collection. One of the advantages of this software is that it is free of cost. Further, through the software the spatial information of the location of the survey can also be recorded. The offline version of the software is available online for the users now where as soon the online version of this software will be made available to the users free of cost.To access the collected data using the offline version of the software, Ms-excel file of the collected data



can be generated easily by the software itself with its inbuilt system and can be accessed directly from the phone memory through Ms-excel.apk available at the Google Store or any other excel apps available online or accessed through uploading the Ms-excel file to any kind of cloud storage (i.e. Dropbox, Google drive etc.) or can be mailed to the email id of the user from the phone memory. For security of data, the user has to register before using it with his valid email id. This feature maintains the confidentiality of the data as only the registered user is able to use this app.

The MAPI software was used for collection of data on crop area and production in two districts of the state of Uttar Pradesh namely, Bulandsahar and Pratapgrah during Rabi season 2015-16 under the pilot study. The software was found to be very useful as it is very fast and easy to operate. The data of the survey was received within a few days after completion of the survey in Ms-excel format and due to its inbuilt checks and validating conditions, the data obtained from the survey was almost error free and exactly as per the expectations of the pilot study. The software is updated with the list of all the states and the districts within each state. Some new upcoming features of this software like online version, online statistical data analysis, secured login, data security through DBMS etc. which is going to make the software more useful and user friendly for the surveyors planning to use it for other surveys. The online data analysis software will help the user to draw basic statistical conclusions from the data within the device just after completion of the survey.

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## RECOGNITIONS

### Dr. Rajender Parsad

- Chaired contributed paper presentation session during National Symposium on Statistics for Sustainable Agricultural Development organized at ICAR-NBSS&LUP, Regional Centre, Kolkata to commemorate the Birth Centenary of Late Professor P.K. Bose during June 17-18, 2016.

### Dr. Hukum Chandra

- As Guest of Honour, delivered Inaugural address in the Statistics Day Programme, organized by NSSO, Ministry of Statistics & Programme Implementation, Government of India at Giridih on 29 June 2016.

## VISIT ABROAD

- Dr. Kaustav Aditya visited National Institute of Statistics of Rwanda, Kigali, Rwanda to impart training on CAPI software during 25-30 April 2016 under the project "*Research on improving methods for estimating crop area, yield and production under mixed, repeated and continuous cropping*" sponsored by FAO, Rome.
- Dr. Ankur Biswas visited National Institute of Statistics of Rwanda, Kigali, Rwanda to impart training on CAPI software during 25-30 April 2016 and Jamaica, Hope Gardens, Kingston 6, Jamaica during 13-17 June 2016 to supervise data collection work under the project "*Research on improving methods for estimating crop area, yield and production under mixed, repeated and continuous cropping*" sponsored by FAO, Rome.
- Dr Hukum Chandra deputed to work as International Consultant for FAO of United Nations under Global Strategy to Improve Agricultural and Rural Statistics in Sri Lanka during 25 April - 06 May 2016.

## HUMAN RESOURCE DEVELOPMENT

### Training Programmes/ Workshops Organised

S.No.	Title	Venue	Date	Sponsored by	No. of Participants
<b>Training Programmes</b>					
1.	Knowledge Enhancement Training programme on HRMS and Payroll module under ICAR-ERP Coordinators: Dr. Alka Arora Dr. Mukesh Kumar	ICAR-IASRI, New Delhi	18- 19 April 2016	ICAR-IASRI, New Delhi	21
2.	Knowledge Enhancement Training programme on HRMS and Payroll module under ICAR-ERP Coordinators: Dr. Mukesh Kumar Dr. N Srinivasa Rao	ICAR-IASRI, New Delhi	02-03 May 2016, 06-07 May 2016 and 23-24 May 2016	ICAR-IASRI, New Delhi	66
3.	A training was imparted to Scientists, Technical Officers and Research Associates on Crop Cutting Experiments (CCE) techniques for major crops and horticultural crops and filling up the schedules under the project "Study to test the developed alternative methodology for estimation of area and production of horticultural crops: IASRI Component of CHAMAN Programme under MIDH"	ICAR-IASRI, New Delhi	10-11 May 2016	CHAMAN Programme	20
4.	Knowledge Enhancement Training programme on Supply Chain Management (SCM) module under ICAR-ERP Coordinator: Dr. Mukesh Kumar	ICAR-IASRI, New Delhi	06-07 June 2016 & 16-17 June 2016	ICAR-IASRI New Delhi	51
<b>Workshops</b>					
5.	Hindi Workshop on जैवमिति में सांख्यिकी तकनीकें Coordinator: Sh. Praksh Kumar Dr. Ranjeet Kumar Paul	ICAR-IASRI, New Delhi	31 May to 02 June 2016	ICAR-IASRI, New Delhi	15

## NEW PROJECTS INITIATED

- Impact of ICT on Agricultural Education in India. Funded by ICAR-Extramural Research project (AGENIASRICOP201603800075)  
NIAP: Rajni Jain, Pavithra S  
ICAR-IASRI: Anshu Bhardwaj, Ranjit Kumar Paul: 08.04.2016-31.03.2017
- Crop yielding forecasting under forecasting agricultural output using space agro meteorology and land based observation (FASL) scheme. (AGENIASRICOP201603900076)  
IMD, New Delhi: KK Singh  
ICAR-IASRI, New Delhi: KN Singh, Bishal Gurung: 13.04.2016-31.03.2017
- Enhancing smallholder's productivity and agricultural growth through technology, sustainable intensification and ecosystem services. (AGENIASRICIP201604000077)  
ICAR-IARI, New Delhi: Amit Kar  
ICAR-IASRI, New Delhi: Prawin Arya: 13.04.2016- 31.03.2019
- Platform for integrated genomics warehouse. (AGENIASRISIL201604100078)  
KK Chaturvedi, MS Farooqi, SB Lal, DC Mishra, Sanjeev Kumar: 10.06.2016-09.06.2019



## PANORAMA OF ACTIVITIES

- Meeting of Institute Research Committee (IRC) was organized during 05-06 April 2016 under the Chairmanship of Director of the Institute and PI of the projects presented the progress of the on-going project
- Research Advisory Committee meeting was held on 15 April 2016.
- Meeting of Institute Joint Staff (IJS) was organized during 08 June 2016 under the Chairmanship of Director, ICAR-IASRI, New Delhi.



Institute celebrating Swachhta Pakhwara during 16-31 May 2016 under Swachh Bharat Mission

## Seminars Delivered

Seminars in different areas of Agricultural Statistics, Computer Application and Bioinformatics were delivered by the Scientists and Students of the Institute. The seminars included presentations on salient findings of the completed research projects and new project proposal 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).

### The Details of Seminars Delivered

Category Number	Type of seminar	
Student	Course	03
	ORW	01
	Thesis	08
Scientist	Project Proposal	02
	Project Completion	02
<b>Total</b>		<b>16</b>

## PUBLICATIONS

### Research Papers

- Aditya, K, Sud, UC, Chandra, H and Biswas, A (2016). Calibration based regression type estimator of the population total under two stage sampling design. *J. Ind. Soc. Agril. Statist.*, **70(1)**, 19-24.
- Alam, NM, Sarkar, SK, Jana, C, Raizada, A, Mandal, D, Kaushal, R, Sharma, NK, Mishra, PK and Sharma, GC (2016). Forecasting meteorological drought for a typical drought affected area in India using stochastic models. *J. Ind. Soc. Agril. Statist.*, **70(1)**, 71-81.
- Badoni, S, Das, S, Sayal, YK, Gopalakrishnan, S, Singh, AK, Rao, AR, Agarwal, P, Parida, SK and Tyagi, AK (2016). Genome-wide generation and use of informative intron-spanning and intron-length polymorphism markers for high-throughput genetic analysis in rice. *Scientific Reports*, **6**: 23765 (DOI: 10.1038/srep23765).
- Bhowmik, A, Varghese, E, Jaggi, S and Varghese, C (2015). Factorial experiments with minimum changes in run sequences. *J. Ind. Soc. Agril. Statist.*, **69(3)**, 243-255.
- Das, Samarendra, Paul, AK, Wah, SD and Raman, RK (2016). A comparative study of various classification techniques in multivariate skewed-normal data. *J. Ind. Soc. Agril. Statist.*, **69(3)**, 271-280.
- Farooqi, MS, Mishra, DC, Rai, N, Singh, DP, Rai, A, Chaturvedi, KK, Prabha, R and Kaur, M (2016). Genome-wide relative analysis of codon usage bias and codon context pattern in the bacteria *Salinibacter ruber*, *Chromohalobacter salexigens* and *Rhizobium etli*. *Biochemistry and Analytical Biochemistry*. **5**:257. doi:10.4172/2161-1009.1000257.
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- Mandal, BN, Gupta, VK and Parsad, R (2016). Balanced treatment incomplete block designs through integer programming, *Communications in Statistics - Theory and Methods*, DOI:10.1080/03610926.2015.1071394.
- Meher, PK, Sahu, TK and Rao, AR (2016). Performance evaluation of neural network, support vector machine and random forest for prediction of donor splice sites in rice. *Ind. J. Genet. Plant Breed.*, **76(2)**, 173-180.
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- Pal, S and Paul, RK (2016). Modelling and forecasting sorghum (*Sorghum bicolor*) production in India using hierarchical time-series models. *Ind. J. Agril. Sci.*, **86(6)**, 803–808.
- Pandey, N, Grover, M and Rai, A (2016). Conservation of properties of outer membranes protein across host genera of pasteurilla multocida suggests common mechanism of action. *Mol Biol* **5**:162. doi:10.4172/2168-9547.1000162
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## Book Chapter

- Parsad, R (2015). Designing of experiments and analysis of data in plant genetic resource management. In: *Management of Plant Genetic Resources, National Bureau of Plant Genetic Resources, New Delhi*, 323 p. (Eds. Jacob Sherry R, N Singh, K Srinivasan, V Gupta, J Radhamani, A Kak, C Pandey, S Pandey, J Aravind, IS Bisht and RK Tyagi), 306-323.

## Project Report

- Arpan Bhowmik, Eldho Varghese, Cini Varghese and Seema Jaggi (2016). Factorial experiments with minimum level changes in run sequences AGENIASRISIL201301200013, I.A.S.R.I./P.R.-01/2016
- AK Gupta, UC Sud, KK Tyagi, Hukum Chandra, Tauqueer Ahmad, Prachi Sahoo Misra, Kaustav Aditya and Ankur Biswas (2016). Pilot study for estimation of seed, feed and wastage ratios of major food grains AGENIASRISOL201300900010, I.A.S.R.I./P.R.-02/2016
- AK Paul, and SD Wahi (2016). Estimation of Heritability under Correlated Errors AGENIASRISIL201400100020, I.A.S.R.I./P.R.-03/2016

## INVITED LECTURES DELIVERED

### Dr. Rajender Parsad

- A lecture on Statistical Concepts, Web Resources and Indian NARS Statistical Computing Portal to Ph.D. (Agricultural Engineering) students at CIAE, Bhopal on April 12, 2016.
- A lecture on Fundamental of Design of Experiments and Web Resources to the participants of Workshop cum training programme on Yield Enhancement in Maize through Breeding and Design of Newly Developed Genotypes in All India Coordinated Research organized by ICAR- IIMR, New Delhi during June 01-03, 2016.

## Dr. Hukum Chandra

- As Resource Person, delivered a lecture in the workshop on “Statistical Computing using R” at Department of Financial Studies, University of Delhi, South Campus, Delhi on 11 June, 2016.

## PAPERS PRESENTED

- Zonal Workshop-cum-Interaction Meet on ICAR-NAIF-Innovation & Incubation Projects for SMD-Engineering Institute of ICAR organized at ICAR-CIAE, Bhopal during 11-12 April 2016.
  - Parsad, Rajender. Achievements of 2015-16 and work plan of 2016-17 for ITMU at IASRI, New Delhi.
- National Symposium on Statistics for Sustainable Agricultural Development organized at ICAR-NBSS&LUP, Regional Centre, Kolkata to commemorate the Birth Centenary of Late Professor PK Bose during 17-18 June 2016.
  - Parsad, Rajender. Significance of Designs for Factorial Experiments and Web Resources on Experimental Designs in Agricultural Research (Invited talk)

## Participation

### Conferences / Workshops / Trainings/ Seminars / Symposia etc.

- One month orientation training at ICAR-IASRI from April 13 – May 12, 2016 and got acquainted with the six divisions of the institute and discussed the various institute funded and external funded ongoing projects with each scientists of the various divisions. Visited the PME cell and library of the institute as part of training. Visited IARI, NCIPM, NBPGR, NIAP and NAAS museum during the training programme. After the completion of training, prepared the PowerPoint presentation on the orientation training and presented it in the institute on May 24, 2016. After presentation, the necessary changes suggested by the institute director, head of the divisions, nodal officers and other members present during the presentation were incorporated in the PowerPoint slides. A draft of report on the orientation training has been prepared to be submitted to the nodal officer. (Dr. Anindita Datta and Mr. Mohd. Harun, Mr. Neeraj Budhlakoti)
- Two days Training Workshop, on usage of Landscape-scale Crop Assessment Tool (LCAT) the LCAT during May 02–03, 2016 at New Delhi, India organized by Oak Ridge National Laboratory (ORNL, USA), the International Maize and Wheat Improvement Center (CIMMYT) and Cereal Systems Initiative for South Asia (CSISA) and the organizing committee of LCAT. (Dr Prachi Misra Sahoo)
- Training programme on Crop Cutting Experiments (CCE) techniques for major crops and horticultural crops and filling up the schedules under the project “Study to test the developed alternative methodology for estimation of area and production of horticultural crops: IASRI Component of CHAMAN Programme under MIDH” during May 10-11, 2016. (Scientists, Technical Officers and Research Associates of the Sample Survey Division)
- 5th Review Workshop of the Network Project on Market Intelligence held on May 16-18, 2016, at ICAR-NIAP, New Delhi. (Dr. Ranjit Kumar Paul)
- Three months attachment training at Department of statistics, Viswa Bharati University under the guidance of Prof. Kashinath Chatterjee. (Dr. Anindita Datta and Mr. Mohd. Harun)
- Workshop on Statistical Computing using R organised at the Department of Financial Studies, University of Delhi, South Campus, Delhi on 11 June 2016. (Dr. Hukum Chandra)
- One month orientation training at ICAR-IASRI from April 13 – May 12, 2016 and got acquainted with the six divisions of the institute and discussed the various institute funded and external funded ongoing projects with each scientists of the various divisions. Visited the PME cell and library of the institute as a part or training. Visited ICAR-IARI, ICAR-NCIPM, ICAR-NBPGR, ICAR-NIAP and NAAS museum during

the training programme. After the completion of training, prepared the PowerPoint presentation on the orientation training and presented it in the institute on May 24, 2016. After presentation, the necessary changes suggested by the institute director, head of the divisions, nodal officers and other members present during the presentation were incorporated in the PowerPoint slides. A draft of report on the orientation training has been prepared to be submitted to the nodal officer. (Dr. Anindita Datta and Mr. Mohd. Harun, Mr. Neeraj Budhlakoti)

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- 5<sup>th</sup> Review Workshop of the Network Project on Market Intelligence held on May 16-18, 2016, at ICAR-NIAP, New Delhi. (Dr. Ranjit Kumar Paul)

## CONSULTANCY /ADVISORY SERVICES PROVIDED

- Dr. RK Paul provided consultancy to Dr. Tapan Mandal, Senior Scientist, NBPGR regarding regression analysis and test of hypothesis in SAS
- Sh. Samrender Das provided analytical help and analyzed the data of a research Scholar Ms. Sagarika Swain, AAU, Jorhat. Provided the information about adopting suitable sampling design to collect data on Marital adjustment of working and non-working and performed data analysis on R and helped in providing the interpretations of the obtained results
- Dr. Ravindra Singh Shekhawat carried out correspondence analysis for Ph.D. work of Ms. Neelam Shekhawat, Ph.D. Scholar, Department of Genetics and Plant Breeding, RCA, MPUAT, Udaipur on April 25, 2016.
- Dr. Bishal Gurung advised to i) Dr. HR Sardana, Principal Scientist (Entomology), National Centre for Integrated Pest Management on the use of Poisson and Negative Binomial distribution for fitting the count of pest and ii) Mr. Achal Lama, Ph.D. student on the use of R software packages for fitting various multivariate GARCH models for volatile data sets.
- Mr. Santosha Rathod carried out “Trend analysis of weather data of Raichur, Karnataka”, M.Sc. thesis work of Ms. Banashree, Department of agricultural extension, UAS, Raichur, on April 22, 2016.
- Dr Hukum Chandra as International Consultant, provided consultancy to FAO of United Nations under Global Strategy to Improve Agricultural and Rural Statistics in Sri Lanka during April 25- May 06, 2016.
- Dr Hukum Chandra advised Ms. Ankuri Agrawal, Ph. D. student, Department of Statistics, Kumaun University, Uttarakhand on Statistics Methodology being used in her thesis.
- Dr. Rajender Parsad advised Dr. Deobrata Sarkar, Principal Scientist (Biotechnology), ICAR-CRIJAF, Barrackpore, Kolkata on the PROC MIXED Statements to be used for the analysis of data generated from an experiment conducted to study the effect of 225 entries (genotypes) in 3 locations over 2 years, in field experiments, each of which was laid out in a 15 x 15 simple lattice (i. e. with 2 replications) design.
- Dr. Eldho Varghese provided advisory services to Ms. Hema, a Ph.D. student from the division of agricultural extension, ICAR-IARI on the use of nonparametric tests for testing various hypothesis framed as part of a study on Farmer - led Innovations and their Techno-economic Feasibility for Scaling up where the measurements have been made either in nominal or in ordinal scale.
- Dr. Bishal Gurung advised Dr. Rashmi Yadav, Senior Scientist (Agronomy), National Bureau of Plant Genetic Resources on use of Combined Over Year Uniformity (COYU) analysis, Combined Over Year Distinctiveness (COY-D) analysis and Stability analysis for measurable (quantitative) characters of Amaranth and Buckwheat taken at different locations over the years.

- Dr. Ankur Biswas advised M.Sc. (Ag. Stat) student, Nobin Chandra Paul, IASRI on analysis of hyperspectral data using SAS.
- Mr. Santosha Rathod Carried out Data Envelopment Analysis of Ms. Subhlaxmi, Ph.D.Scholar (Agril. Economics), IAS BHU, Varanasi on May 27, 2016.
- Mr. Samrender Dass provided analytical help and analysed the data of a research Scholar Ms. Sagarika Swain, AAU, Jorhat, provided the information about adopting suitable sampling design to collect data on Marital adjustment of working and non-working women in Odisha, further data analysis was performed on R and helped in providing interpretations of the obtained results.
- Dr. Anindita Datta advised M.Sc. Student, Mr. Sumit Kumar Dey from P. G. School, ICAR-IARI on the procedure of analysis using SAS of an experiment conducted in factorial CRD. The experiment was impact of elevated carbon dioxide and cyanobacterial inoculation on growth, yield and nitrogen fixation in legumes under different doses of phosphorus. There were three factors i.e. Carbon dioxide, cyanobacterial inoculation and doses of phosphorus.
- Mr. Mohd. Harun advised M.Sc. Student, Mr. Hansraj Bhardwaj from Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur on the procedure of analysis using SAS of an experiment conducted in simple lattice design of 13 x 13 with two replications. The number of genotype compared in the study include 165 lines with four checks. The student was also advised on contrast analysis for making comparison among lines versus checks.
- Dr. Ravindra Singh Shekhawat carried out correspondence analysis for Dr. Madhusudan Bhattarai, Consultant, ICAR-IFPRI, New Delhi.
- Mr. Mrinmoy Ray advised Priyanka Anjoy M.Sc. (Agril. Stat.) Student of ICAR-IASRI about fitting procedure of Wavelet Neural Network (WNN).
- Mr. Prakash Kumar provided consultancy work to analyze the fractional factorial design data of gladiolus crop of Ms. Laxmi Durga, Ph.D. Student, Horticulture, ICAR-IARI, New Delhi.
- Dr. Rajender Parsad advised Dr. Aravind Kumar Shukla, Project Coordinator, AICRP on Micronutrients, ICAR-IISS, Bhopal on the analysis of data generated from Split Plot design with 6 main plot treatments as Varieties V1=GW-322 V3=HI 8627 V5= HI-1500 V2= Jw-3211 V4=HW2004 V6=C-306 and subplot treatments as T1-Control, T2- 100 kg ZnSO4 Soil, T3- 3 Foliar spray, T4= 100 ZnSO4+ 3 Foliar spray, T5 -100 kg ZnSO4 Soil + 25% N and T6=Foliar Zn + 25% N. The varieties V1, V3 and V5 are Zn efficient and V2, V4 and V6 are Zn inefficient. For comparing Zn efficient and Zn inefficient cultivars, he was advised on contrast analysis on Main Plot treatments.
- Dr. Eldho Varghese advised i) Dr. Dipakar Mahanta, Scientist, ICAR-VPKAS, Almora was advised on the procedure of pooled analysis of data pertaining to experiment conducted under factorial setup over different years. Available SAS code has been modified to perform said analysis and provided to him. and ii) Mr. Vinod kumar P, an M.Sc. student from the division of Entomology on the use of territorial map in discriminating presence of a species (*Holotrichia serrata*) over different locations based on several phenotypic characters.
- Dr. Sukanta Dash advised a Ph.D. Student Gaurendra Gupta to go through the EGD for his experiment. He wants to conduct experiment in which he will grow pigeon pea in Kharif season with 9 different treatments including control and then same treatments with two level each will grow for wheat in Rabi season.
- Dr. Arpan Bhowmik advised Mr. Shahabuden Khwahany, An afgan national student of CESCRA, ICAR-IARI, New Delhi on the use of PCA for assessing the impact of biogas slurry application on green house gas emission and soil microbial properties. ANOVA was also performed for identifying best treatment combination among six different treatments.

- Dr. Ravindra Singh Shekhawat carried out correspondence analysis for Shwetha Soju M.Sc. (Agril. Economics) at RCA, MPUAT, Udaipur.
- Dr. Ravindra Singh Shekhawat carried out correspondence analysis for Dr. Madhusudan Bhattarai, Consultant, IFPRI, New Delhi.
- Dr. Wasi Alam provided advisory service to the student Miss Shraddha Ahirwar, ICAR-IARI, New Delhi on completely randomized design and parametric tests.
- Mr. Mrinmoy Ray Suggested Tilak Mondal, Scientist, VPKAS-Almora how to analysis RBD using SAS and SPSS
- Mr. Mrinmoy Ray Analysed data for Dr. Madhubala Thakrey , Scientist, ICAR-IARI.
- Mr. Santosha Rathod carried out cluster analysis for Mr. Raghunandan, Ph.D Scholor (GPB), ICAR-IARI, New Delhi, on 15/06/2016.
- Dr. PK Meher provided data advisory service to Dr. Vandana Jaiswal, Post Doctoral Fellow, National Institute of Botanical Research, Lucknow. Epitasis interaction analysis was performed in genome wide dataset of Wheat having 946 markers corresponding to 14 phenotypic traits. The analysis was carried out using *SNPassoc* package of R-software.
- Dr. PK Meher provided data advisory service to Dr. Santosh, H. B. , Scientist (Plant Breeding), Division of Crop Improvement, ICAR - Central Institute for Cotton Research (CICR), Nagpur. GGE biplot analysis was carried out for 6 different traits corresponding to 10 genotypes of chickpea grown in 9 different environments with 3 replications. The analysis was performed by using *GGEbiplotGUI* package of R-software.
- Dr. PK Meher developed a computational method for species identification using DNA barcode. Based on this approach a web server SPIDBAR (<http://cabgrid.res.in:8080/spidbar/>) has also been developed for easy identification of species by the taxonomist.



## PERSONNEL

### Congratulations on your Appointment

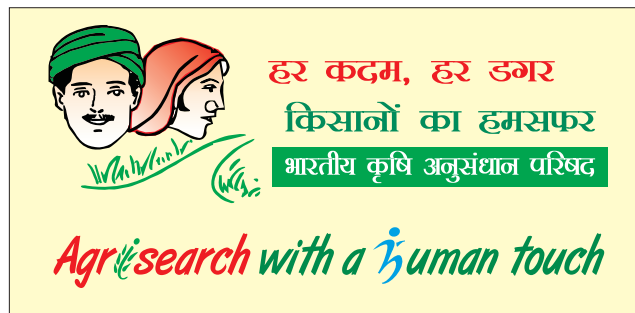
Name	Designation	Effective Date
Dr. Anindita Dutta	Scientist	11.04.2016
Md. Harun	Scientist	11.04.2016
Sh. Rajiv ranjan Kumar	Scientist	11.04.2016
Sh. Neeraj Budhlakoti	Scientist	11.04.2016

### Congratulations on your Promotion

Name	Designation	Effective Date
Sh. BR Modak	Assistant Chief Technical Officer	01.01.2013
Dr. Prawin Arya	Principal Scientist	26.08.2014
Dr. Sudeep	Principal Scientist	27.10.2014
Dr. Alka Arora	Principal Scientist	27.11.2014
Sh. Satya Pal Singh	Assistant Chief Technical Officer	01.01.2015
Smt. Vijaya Luxmi Murthy	Private Secretary	25.06.2016

### Wish you Happy Retired Life

Name	Designation	Effective Date
Smt. Anita Kohli	Private Secretary	30.04.2016
Ms. Vijay Bindal	Chief Technical Officer	31.05.2016
Smt. Gursharan Kaur	Chief Technical Officer	31.05.2016
Sh. SC Pandey	Chief Technical Officer	30.06.2016
Sh. Dharam Pal Singh	Chief Technical Officer	30.06.2016
Sh. Mohan Singh	Skilled Supporting Staff	30.06.2016



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