

# ICAR NEWS

Volume 11

No. 1

April - June, 2006



INDIAN AGRICULTURAL STATISTICS RESEARCH INSTITUTE ( ICAR ), LIBRARY AVENUE, PUSA, NEW DELHI- 110 012



## From Director's Desk . . . .

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

In the study on "Some investigations on design and analysis of agro-forestry experiments", the concept of strongly neighbour balanced designs has been defined and some methods of constructing complete block designs for two factors have been obtained. Some series of incomplete block designs balanced for adjacent tree effects have also been obtained. These designs are shown to be partially variance balanced for direct effects.

Another study is on "Statistical and algorithmic approach for improved estimation of treatment effects in repeated measurements designs(RMDs)". Designs in which each experimental unit receives some or all of the treatments, one at a time, over a period of time are called repeated measurements designs (RMDs). A class of reference balanced RMDs for estimating direct effects of formulations useful for bioequivalence trials has been obtained using Williams Square RMDs.

A training programme on Design and Analysis of Experiments for Rapeseed-Mustard Varietal Trials for the plant breeders and statisticians of All India Co-ordinated Research Project on Rapeseed-Mustard and National Research Centre on Rapseed-Mustard, Bharatpur was organized.

A two days Hindi Karyashala for scientific and technical personnel of the Institute was also organised at the Institute.

Dr. Rajender Parsad, National Fellow was deputed to CIMMYT, Mexico for a study visit on Hands-on Experience on Analysis of Farmers Participatory Research Trials conducted by Rice-Wheat Consortium for Indo-Gangetic Plains. Dr. AR Rao proceeded to Cold Spring Harbor Laboratory, New York, USA for the Biotechnology Overseas Associateship 2004-05 (Long Term) award.

The Institute also participated in number of meetings/conferences/symposia/workshops, etc. It is hoped that the contents of this document would be informative and useful for scientists in NARS. Any suggestions for improving the contents of the newsletter further, would be highly appreciated.

  
(SD SHARMA)

## IN THIS ISSUE

- Research Achievements
- Human Resource Development
- Visit Abroad
- Honours/ Awards
- Panorama of Activities
- Participation
- Hindi Karyashala
- Computing Facilities
- Seminars Delivered
- Consultancy/ Advisory Services
- Publications
- Personnel

### निदेशक की कलम से . . . .

समाचार पत्र के इस अंक में प्रतिवेदनाधीन अवधि के दौरान कुछ विशिष्ट अनुसंधानिक एवं प्रशिक्षण सम्बन्धी उपलब्धियों एवं अन्य महत्वपूर्ण गतिविधियों पर प्रकाश डाला गया है।

“कृषि त्रिभुज परीक्षणों की अभिकल्पना और विश्लेषण पर कुछ अन्वेषणों” पर एक अध्ययन में प्रबल प्रतिवेशी संतुलित अभिकल्पनाओं की अवधारणा को परिभाषित किया गया और दो कारकों के लिए पूर्ण ब्लॉक अभिकल्पना तैयार करने की कुछ विधियाँ विकसित की गईं। आस-पास के वृक्ष के कुछ प्रभावों के लिए अपूर्ण संतुलित ब्लॉक अभिकल्पनाओं की कुछ श्रृंखलाएँ भी प्राप्त की गईं। परोक्ष प्रभावों के लिए ये अभिकल्पनाएँ आंशिक रूप से प्रसरण संतुलित दिखाई देती हैं।

“पुनरावृत्त मापन अभिकल्पनाओं (RMDs) में उपचार प्रभावों का समुन्नत आकलन करने के उद्देश्य से सांख्यिकीय एवं एल्गोरिथमिक विधि” पर एक अन्य अध्ययन में जैव समतुल्य परीक्षणों के लिए उपयोगी संरूपणों के परोक्ष प्रभावों का आकलन करने हेतु निर्देश संतुलित यानि रैफरेंस बैलेंसड RMDs का एक वर्ग विलियम्स स्क्वायर RMDs की सहायता से विकसित किया गया। पुनरावृत्त मापन अभिकल्पनाएँ (RMDs) ऐसी अभिकल्पनाएँ हैं जिनमें किसी कालावधि के दौरान, एक बार में एक, कुछ या सभी उपचार प्राप्त होते हैं।

अलसी-सरसों पर अखिल भारतीय समन्वित अनुसंधान परियोजना और राष्ट्रीय अलसी-सरसों अनुसंधान केन्द्र, भरतपुर में कार्यरत पादप प्रजनकों एवं सांख्यिकीविदों के लिए अलसी-सरसों के किस्म संबंधी परीक्षणों की अभिकल्पनाएँ तैयार करने तथा विश्लेषण पर एक प्रशिक्षण कार्यक्रम चलाया गया।

संस्थान के वैज्ञानिक एवं तकनीकी कर्मियों के लिए एक दो दिवसीय हिन्दी कार्यशाला का भी आयोजन किया गया।

भारत-गंगा के मैदानों के लिए चावल-गेहूँ संघ द्वारा चलाए गए किसान सहभागिता अनुसंधान परीक्षणों के विश्लेषण पर व्यावहारिक अनुभव प्राप्त करने हेतु डा. राजेन्द्र प्रसाद, राष्ट्रीय अध्येयता को एक अध्ययन दौरे के लिए प्रतिनियुक्त किया गया। बायोटेक्नोलॉजी ओवरसीज़ ऐसोसिएटशिप 2004-05 (दीर्घावधि) पुरस्कार हेतु डा. ए.आर. राओ, कोल्ड स्प्रिंग हार्बर लैबोरेटरी, न्यू यार्क, यू.एस.ए. के लिए खाना हो चुके हैं।

संस्थान द्वारा अनेक बैठकों/ सम्मेलनों/ संगोष्ठियों/ कार्यशालाओं इत्यादि में भी सहभागिता की गई। आशा है कि इस अंक की विषयवस्तु नार्स (एन.ए.आर.एस.) के वैज्ञानिकों के लिए सूचनाप्रद एवं उपयोगी होगी। समाचार-पत्र की विषयवस्तु में भावी सुधार लाने के लिए आपके सुझावों का स्वागत है।



(सुखदेव शर्मा)

## RESEARCH ACHIEVEMENTS

● In the study on “Some investigations on design and analysis of agro-forestry experiments”, the experiment consisting of tree and crop combination in a plot, it is suspected that the trees species grown in one plot may affect the performance of treatments applied on the neighbouring plots. For such situations, the concept of strongly neighbour balanced designs has been defined and some methods of constructing complete block designs for two factors (tree and crop) in a plot strongly neighbour balanced for one factor (tree) have been obtained. These designs are seen to be variance balanced for estimating the direct effects of contrasts in the combinations of levels of both the factors (tree and crop). Some series of incomplete block designs balanced for adjacent tree effects have also been obtained. These designs are shown to be partially variance balanced for direct effects.

● In the study on “Statistical and algorithmic approach for improved estimation of treatment effects in repeated measurements designs (RMDs)”, a class of reference balanced RMDs for estimating direct effects of formulations useful for bioequivalence trials has been obtained using Williams Square RMDs. Designs in which each experimental unit receives some or all of the treatments, one at a time, over a period of time are called repeated measurements designs (RMDs). The distinguishing feature of these designs is that the treatments applied in a particular period influence the responses of the experimental unit not only in that period but also leaves residual effects in the succeeding periods. In a RMD, a sequence of treatments is applied to an experimental unit and observations are recorded over the periods and hence it is very much possible to observe interaction between treatments and experimental units. A non-additive model with interaction effects is used to deal with such situations as these effects also contribute significantly to the response measured. Considering a non-additive model, a balanced, uniform and non-circular class of RMDs with a pre-period has been shown as universally optimal for the estimation of direct effects using calculus for factorial arrangements. Further, computer programs have been developed in Visual Basic 6.0 for generation and randomization of different classes of RMDs catalogued from literature. Since it is very difficult to get real data for desired experimental situations, computer programs have also been written for

simulating RMD data under different models of RMDs. Again, application potential of RMDs in bioequivalence trials was studied and some new classes of RMDs have been obtained which are reference balanced for residual effects.

#### HUMAN RESOURCE DEVELOPMENT

- A training programme on Design and Analysis of Experiments for Rapeseed-Mustard Varietal Trials for the plant breeders and statisticians of All India Co-ordinated Research Project on Rapeseed-Mustard, National Research Centre on Rapeseed-Mustard, Bharatpur was organized during May 10-11, 2006. 13 participants attended the training programme. The topics covered in this training programme included Fundamentals of Design of Experiments, MS-Excel: Analysis of Experimental Data, SPSS: An Overview, Combined Analysis of Data and Stability Analysis. Dr. Rajender Parsad was the Course Director for this training programme.



#### VISIT ABROAD

- Dr. Rajender Parsad, National Fellow was deputed to CIMMYT, Mexico from May 24-June 28, 2006 for a study visit on Hands-on Experience on Analysis of Farmers Participatory Research Trials conducted by Rice-Wheat Consortium for Indo-Gangetic Plains. During this study visit, work was mainly done on ASREML (a statistical package that fits linear mixed effects models using Residual Maximum



Likelihood (REML)) for spatial data analysis. Work on SAS was also done to obtain biplots from Additive Main Effects and Multiplicative Interactions, and Sites Regression (SREG) models. 5 data sets of RWC for IGP were analyzed. In this analysis, farmers or villages are taken as blocks and resource conservation technology options as treatments. Farmers/villages effects were taken as random. Efforts were also made to find year x treatment interactions and variety x treatment interactions. The efforts were also made to identify technology for a given variety or soil type. The results obtained were communicated to Dr. RK Gupta and other scientists involved for their comments. The data file preparation for the analysis is very important. Some suggestions were also made on how to prepare the EXCEL files to maintain uniformity across overall locations and years.

#### HONOURS/ AWARDS

- संस्थान के पूर्वानुमान तकनीक प्रभाग की कार्यकारी प्रधान एवं राजभाषा प्रभारी, डॉ.(श्रीमती) रंजना अग्रवाल को सूचना एवं प्रसारण मंत्रालय, भारत सरकार के प्रकाशन विभाग द्वारा वर्ष 2003 के लिए आयोजित भारतेन्दु हरिश्चन्द्र पुरस्कार योजना के अन्तर्गत उनकी पाण्डुलिपि "मच्छर ने समझाया" के लिए 12 मई, 2006 को माननीय सूचना एवं प्रसारण मंत्री, श्री प्रियरंजन दासमुंशी जी के कर-कमलों द्वारा संयुक्त रूप से द्वितीय पुरस्कार प्रदान किया गया ।
- Dr. AR Rao has left for Cold Spring Harbor Laboratory, New York, USA for the Biotechnology Overseas Associateship 2004-05 (Long Term) award.

#### PANORAMA OF ACTIVITIES

- संस्थान में हिन्दी के प्रगामी प्रयोग की स्थिति का जायज़ा लेने के लिए गृह मंत्रालय, राजभाषा विभाग के क्षेत्रीय कार्यान्वयन कार्यालय, दिल्ली द्वारा दिनांक 22 मई, 2006 को संस्थान का सफलतापूर्वक निरीक्षण किया गया ।



- Meeting of the Institute Joint Staff Council was held on 09 June 2006.
- Meeting of the Grievance Committee was held on 24 June 2006.



- 53<sup>rd</sup> meeting of the Management Committee was held on 23 June 2006 under the Chairmanship of Prof. SD Sharma, Director, IASRI.



#### **PARTICIPATION IN CONFERENCES/ WORKSHOPS/ SEMINARS/ SYMPOSIA/ TRAININGS etc.**

The Institute participated in the following Conferences/Workshops/Trainings:

- The regional workshop on STCR was held during 27-28 April 2006 at JNKVV, Jabalpur. A presentation was made for initiation of new experiments for its design and analysis. Met the Project Coordinator (STCR) and the officer in-charge from 4 Cooperating Centres, viz. Bikaner (Rajasthan), Rahuri (Maharashtra), Hyderabad (A.P.) and Jabalpur (M.P.) and explained the design and the analysis details.
- National training programme on “Bioinformatics in Conservation of Microorganism” at NBAIM, MAU Nath Bhanjan, UP during 01-08 May 2006.
- National workshop on “Site specific nutrient management for sustainable high yield agriculture” held at PDCSR, Modipuram on 18-19 May 2006.
- Five days workshop as member of the writing team for the development of textbook on Science & Technology at Upper Primary State (Class VII) during May 29 to June 2, 2006 at NCERT, New Delhi.
- 5<sup>th</sup> Dr. DS Tyagi Memorial Lecture by Dr. T Haque, Chairman, CACP, organized by TERI on June 02, 2006 at NAAS committee room.
- 26<sup>th</sup> workshop of AICRP on “Farm Implements & Machinery” at MPKV, Rahuri during 06-09 June 2006.
- 12 जून से 16 जून, 2006 के दौरान केन्द्रीय हिन्दी संस्थान पृथ्वीराज रोड द्वारा आयोजित “प्रशिक्षकों का प्रशिक्षण कार्यक्रम” में भाग लिया।
- 27<sup>th</sup> workshop of “All India Co-ordinated Research Project on Cropping Systems” held at GBPUA&T, Pantnagar during 26-29 June 2006. One scientist presented the progress of the adhoc project entitled “Combined Analysis of Experiments on Long-Range Effect of Continuous Cropping and Manuring on Soil Fertility and Yield Stability” during the workshop.

#### **PARTICIPATION OF INSTITUTE IN VARIOUS MEETINGS, ETC.**

The Institute participated in the following:

- Governing Body Meeting of the Institute of Applied Statistics and Development Studies, Lucknow held on 13 April 2006.
- Technical Committee Meeting on 18<sup>th</sup> Livestock Census under the Chairmanship of Animal Husbandry Commissioner at Krishi Bhavan, New Delhi on 05 April 2006.
- Meeting of Zonal Research and Extension Advisory Committee (ZREAC) of Krishna-Godavari Zone, ANGRAU, Guntur (27-29 April 2006).
- Meeting with Dr. BS Pathak, Director, SPRERI, Vallabh Vidyanagar (Gujarat) for discussion relating to the final report of the farm mechanization project on 03 April 2006.
- Meeting with officials of Mahindra & Mahindra at Mumbai on 04 April 2006.
- Meeting with scientists in the Division of Agricultural Engineering, ICAR Research Complex for NEH Region, Umiam, Barapani (Meghalaya) during 07-08 April 2006.
- Meeting with the officers of Mahindra & Mahindra, Mumbai under the Chairmanship of DDG (Engg.) on 05 May 2006.
- Meeting with DDG (Engg.), ICAR for reviewing the draft material relating to Agricultural Research Data Book 2006 on 09 May 2006.
- Executive Council Meeting of Indian Society of Agricultural Statistics on 23 May 2006.
- Meeting of the Consultancy Processing Cell on 26 May 2006 for discussing the proposal pertaining to a training programme to be organized for officers of CSO, MOSPI, GOI.

- Meeting with Principal Advisor, CSO regarding the project entitled, “Study to investigate the causes of variation between official and trade estimates of cotton production”.
- Meeting for development of concept note on “National Intelligence Network (NAIN) for Agricultural Research” during 19-20 May 2006 at IASRI, New Delhi.
- Meeting for development of concept note on “Realizing potentials of agroforestry for sustainable development with emphasis on household livelihood security” on 22 May 2006 at IASRI, New Delhi.
- VI Meeting of the task force for “Study on assessment of survey capability of private sector” at Sardar Patel Bhavan, New Delhi on 07 June 2006.
- Meeting of the committee constituted to decide the educational qualifications of technical staff on 22 June 2006.
- Meeting of the working group constituted for the land use statistics at Krishi Bhavan, New Delhi on 28 June 2006.
- Meeting with Adviser regarding Horticulture Statistics at Shastri Bhavan, New Delhi on 29 June 2006.
- Sub-committee Meeting pertaining to 18<sup>th</sup> Livestock Census under the Chairmanship of Animal Husbandry Commissioner on 29 June 2006.
- Technical Committee Meeting of FASAL.

### हिन्दी कार्यशाला

- दिनांक 16-17 जून, 2006 के दौरान “वैज्ञानिक/तकनीकी सामग्री का हिन्दी अनुवाद” विषय पर हिन्दी कार्यशाला आयोजित की गई। इस कार्यशाला में 23 प्रतिभागियों ने सहभागिता की। इसमें वैज्ञानिक एवं तकनीकी शब्दावली आयोग के पूर्व अध्यक्ष, प्रो. सूरज भान सिंह ने “वैज्ञानिक अनुवाद एवं लेखन” विषय पर तथा केन्द्रीय अनुवाद ब्यूरो के निदेशक, डॉ विचार दास ने “वैज्ञानिक अनुवाद की समस्याएँ” विषय पर व्याख्यान दिए। कार्यशाला का उद्घाटन एवं समापन संस्थान के निदेशक द्वारा किया गया तथा कार्यशाला के समापन के अवसर पर प्रतिभागियों को प्रमाण-पत्र वितरित किए गए।



### COMPUTING FACILITIES

#### Wide Area Network

- Internet services have been provided to the users and the website of IASRI is being updated regularly. This site has been visited 172383 times since 05 September 2003.

#### SEMINARS DELIVERED

21 seminars on different areas of agricultural statistics and computer application were conducted. Seminars were delivered for presenting the salient findings of the completed research projects. In addition to these seminars, students Outline of Research Work (ORW) seminars, thesis seminars and course seminars were also delivered for their requirement of M.Sc. and Ph.D. (Agricultural Statistics) and M.Sc. (Computer Application) degrees. The two guest speakers were Mr. Baidya Nath Mandal and Prof. Mousami Bose.

#### The details of Seminars delivered

Category	Number
Student	14
Scientist	05
Outsider(Guest)	02
<b>Total</b>	<b>21</b>

### CONSULTANCY/ ADVISORY SERVICES

- Dr. Dinesh Kumar, Sr. Scientist, Division of Agronomy, IARI, New Delhi was advised on the analysis of experimental data conducted for standardization of nitrification inhibiting property of neem oil coated urea for Kharif Rice, 2005. In one experiment, 16 treatments tried were all possible combinations of 5 sources of nitrogen viz. prilled urea, 500 ppm oil coated urea, 1000 ppm oil coated urea, 2000 ppm oil coated urea, 5000 ppm oil coated urea and three doses viz. 50, 100, 150 kg/ha and one absolute control. In the another experiment, 16 treatments tried were all possible combinations of 5 sources of oil viz. FFA, pure oil, meliacins, saturated and unsaturated and three doses of oil viz. 500 ppm, 1000 ppm and 5000 ppm and one absolute control. The experiments were conducted using a randomized complete block design. The analysis was carried out using the concepts of contrast analysis.
- Sh. Abdullah Altaher, Ph. D. student of Molecular Biology and Biotechnology, IARI,

New Delhi was advised on the analysis of data pertaining to an experiment related to study of wheat transformation for tolerance to dehydration stress. 30 wheat genotypes were grown in the field in a randomized complete block design with 3 replications. Samples for each plot were taken and studied for callus formation in the laboratory. Samples from these 90 plots were also investigated in 2 regeneration media and the characters observed were G-spot, shoots per callus and number of shoots. The analysis was performed using PROC GLM of SAS.

- Dr. Arun Kumar Joshi, Professor, Department of Genetics and Plant Breeding, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, presently Visiting Scientist at CIMMYT, Mexico was advised on analysis of data pertaining to experiments conducted with resource conservation technology viz. zero tillage and conventional tillage in combination with different varieties of wheat to identify varieties that are good for zero tillage/ conventional tillage.

## PUBLICATIONS

### Research Papers Published

- Arora, Alka, Singh, Balbir, Dahiya, Shashi and Farooqi, Modh. Samir (2005). Planning and distribution of manpower of ICAR using PERMISnet. *J. Ind. Soc. Agril. Statist.*, **59(2)**, 141-145.
- Dash, Jyotiprava, Sarangi, A, Singh, AK, Dahiya, Shashi (2005). Biodrainage: An alternative technique to control water logging and salinity. *J. Soil Water Conservation*, **4**, 149-154.
- Ghosh, Himadri, Das, Ashish and Midha, Chand K (2005). Optimal designs for estimation of ratio of variance components in diallel crosses. *Sankhya*, **67(4)**, 785-794.
- Misra, P, Rai, A, Singh, R, Handique, BK and Rao, CS (2005). Integrated approach based on remote sensing and GIS for estimation of area under paddy crop in north-eastern hilly region. *J. Ind. Soc. Agril. Statist.*, **59(2)**, 151-160.
- Narang, MS, Sud, UC and Gupta, AK (2006). A note on a biased estimator for two stage sampling design. *Ind. J. Applied Statist. Sci.*, **2(1)**, 1-6.
- Rathore, Abhishek, Parsad, Rajender and Gupta, VK (2006). Computer aided search of efficient block designs for making all possible pairwise treatment comparisons. *J. Statist. Applications: A Publication of 'Forum of Interdisciplinary Mathematics'*. **1(1)** 15-33.
- Singh, DR and Singh, RP (2006). Structure, determinants and efficiency of groundwater

## Forthcoming International Conference on

*Statistics and Informatics in Agricultural Research*

Diamond Jubilee Celebrations of  
Indian Society of Agricultural Statistics

(27-30 December 2006)

The Conference will be Focussed on Six Major Themes

- Theme 1:** Statistical Application in Agricultural Research
- Theme 2:** Emerging Issues in Areas of Basic Statistical Research
- Theme 3:** Agricultural Informatics
- Theme 4:** Statistical and Comutational Biology in Agriculture
- Theme 5:** Statistical and Economic Issues for Prosperity of Rural Community
- Theme 6:** Human Resource Development for Agricultural Statistics and Informatics

### Conference website

<http://www.iasri.res.in/icsi2006>

## Saleable Technologies

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



A participant receiving certificate from Prof. SD Sharma, Director, IASRI during Valedictory Function



markets in western Uttar Pradesh. *Agric. Eco. Res. Rev.*, **19(1)**, 129-144.

#### Research Papers Accepted for Publication

- Choudhary, G., Kumar, J., Walia, S., Parsad, R., Parmar, B.S. Development of formulations of carbofuran and evaluation of their efficacy against *Meloidogyne cognita*. *J. Agric. Food Chem.*
- Ghosh, H, Prajneshu and Sunilkumar, G (2006). Modelling and forecasting of bilinear time-series using frequency domain approach. *J. Combinatorics, Information and System Sciences.*
- Ghosh, H, Sunilkumar, G and Prajneshu. Nonlinear time-series modelling: A Mixture – ARCH approach. *J. Ind. Soc. Agril. Statist.*
- Narang, MS, Sud, UC and Gupta, AK. A note on a biased estimator for two stage sampling design. *Int. J. Agric. Statist. Sci., Muzaffarnagar.*
- Sarada, C and Prajneshu (2005). On appropriate parameterization of nonlinear statistical model. *J. Ind. Soc. Agric. Statist.*

#### Research Paper Presented in the Conference

- Paper entitled "Forecasts of Agricultural Production" written by Ranjana Agrawal

and V. Ramasubramanian was presented in workshop on human intelligence, forecasts and planning for the fertilizer sector organized by Fertilizer Association of India during 17-19 April 2006 at the Qutab -A Clarion Collection Hotel, New Delhi.

#### PERSONNEL

##### Wish you happy retired life

- Sh. Ramesh Chand, Photographer(T-5), w.e.f. 30-04-2006
- Sh. Khem Chand KPO(T-4), w.e.f. 30-04-2006
- Sh. D.K. Mehta, Scientist(SG), w.e.f. 31-05-2006
- Smt. Ajit Kaur Bhatia, Scientist(SG), w.e.f. 31-05-2006
- Sh. S.S. Kutaula, Principal Scientist, w.e.f. 31-05-2006

##### Congratulations on your promotion

- Smt. Sarita Mahendru, Assistant, w.e.f. 17-02-2006
- Smt. Sima Dahiya, Jr. Clerk, w.e.f. 05-05-2006
- Sh. Basant Kumar, Sr. Clerk, w.e.f. 30-06-2006

#### OBITUARY

The Director, Staff and Students of IASRI deeply condole the death of Sh. Sunil Dutt Sharma, AECO(T-4) who expired on 14 April 2006

फार्म संबंधी सभी समस्याओं पर विशेषज्ञ की सलाह के लिये प्रातः 6.00 बजे से रात 10.00 बजे तक सभी सातों दिन टोल फ्री नम्बर 1551 पर डायल करें।

For expert's advise on all farm related problems, dial toll free number 1551 from 6 am to 10 pm on all seven days

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Director, IASRI (ICAR), Library Avenue, Pusa,  
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