ANNUAL REPORT

2001-02

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

GOAL

Indian Agricultural Statistics Research Institute (IASRI) promotes and conducts research,education and training in Agricultural Statistics and Computer Application in Agriculture.

MANDATE

- To undertake basic, applied and adptive research leading to new developments in Agricultural Statistics and related fields for b ridging of gaps in the application of Statistical Techniques to the problems of Agricultural Research.
- To assist in the development and strengthening of National Agricultural Statistics System.
- To conduct post-graduate and in-service training courses in Agricultural Statistics and Computer Applications in Agriculture.
- To provide advisory/consultancy services to agricultural scientists, planners, policy makers and others on their statistical and computing requirmenents.
- To act as a repository of information on Agricultural Statistics for research and dissemination of such information.
- To develop the Institute as an Advanced Centre of Excellence for education and training in Agricultural Statistics and Computer Application.
- To liaise with ICAR Institutes, SAUs and StateAgricultural / Animal Husbandry / Veterinary Sciences departments etc. and undertaking sponsored research & training for national and international organisations.

MILESTONES

1930	•	Institute made a modest beginning as Statistical Section under ICAR
1940	•	Activities of the Section increased with appointment of Dr PV Sukhatme
1945	•	Re-organisation of statistical section into statistical branch which soon acquired international recognition as a centre for research and training in the field of Agricultural Statistics
1949	•	Re-named as Statistical Wing
1952	•	Activities of Statistical Wing further expanded and diversified with the recommendations of FAO experts Dr Frank Yates and Dr DJ Finney
1955	•	Statistical Wing moved to its present campus
1959	•	Re-designated as Institute of Agricultural Research Statistics (IARS)
1964	•	Installation of IBM 1620 Model-II Electronic Computer
	•	Signing of the MOU with IARI, New Delhi to start new courses leading to M.Sc. and Ph.D. degrees in Agricultural Statistics in collaboration with IARI
1970	•	Status of a full fledged Institute in the ICAR system, headed by Director
1976	•	Three storeyed Computer Centre Building constructed
1977	•	Installation of third generation computer Burroughs B-4700
1978	•	Name changed to Indian Agricultural Statistics Research Institute (IASRI) with a full fledged discipline of 'Agricultural Statistics'
1983	•	Identified as Centre of Advanced Studies in Agricultural Statistics and Computer Applications under the aegis of the United Nations Development Programme (UNDP)
1985-86	•	New Course leading to M.Sc. degree in Computer Application in Agriculture, initiated.
1991	•	Burroughs B-4700 system replaced by a Super Mini COSMOS LAN Server
1992	•	Administration-cum-Training Block of the Institute inaugurated
1993-94	•	M.Sc. degree in Computer Application in Agriculture changed to M.Sc. (Computer Application)

1995	• Center of Advance Studies in Agricultural Statistics & Computer Application established by Education Division, ICAR
1996	• Establishment of Remote Sensing & GIS lab with latest software facilities
1997	• Senior Certificate Course in 'Agricultural Statistics and Computing' Revived • Establishment of Modern Computer Labs
1998	• Divisions of Sample Survey Methodology & Analysis of Survey Data, Design of Experiments & Analysis of Experimental Data and Bio-statistics & Statistical Genetics, renamed as Sample Survey, Design of Experiments and Biometrics divisions respectively. • Revolving Fund Scheme on Short Term Training Programs in Information Technology initiated
1999	• Strengthening of LAN & Intranet with Fibre optics & UTP cabling • Substantial growth in outside funded projects and training programmes
2000	• Divisions of Forecasting Techniques for Crops, Diseases and Pests and Statistical Economics, renamed as Forecasting Techniques and Econometrics divisions respectively.
2001	• Data Warehousing activities (INARIS project under NATP) initiated • Establishment of Revolving Fund Multimedia Lab for conduct of training programs in Information Technology.

PREFACE

Indian Agricultural Statistics Research Institute (IASRI), a premier Institute in Agricultural Statistics and Computer Application in the country, has been promoting and conducting research and human resource development activities in Agricultural Statistics and Computer Application. The Institute has been striving hard to forge ahead for fulfilling its goals and mandate through activities in its various divisions/units and creating the needed enabling environment to facilitate excellent output.

It gives me immense pleasure in presenting the Annual report 2001-2002 of the Institute. The report depicts the panorama of research activities, notable research achievements, new methodologies developed, significant consultancy services provided and the linkages cultivated/nurtured with various ICAR Institutes, SAUs and other research organisations in India and abroad.

The Institute conducts research, teaching and training in various branches of Agricultural Statistics. Major accomplishments have been regarding the development of survey methodology - the Small Area Crop Estimation Methodology (SACEM) for National Agricultural Insurance Scheme and the substantial increase in the outside funded projects. Under the Revolving Fund Scheme (RFS) on short term training programs in Information Technology, various training courses were conducted to train manpower of National Agricultural Research System (NARS) in the emerging areas of Information Technology. A new multimedia laboratory was established under the RFS during the year. There is a need to consolidate the gains made and to gear up to face the future challenges.

The Institute initiated various new studies/projects during the year viz. **NATP** (i) Integrated National Agricultural Resources Information System (INARIS), (ii) Assessment of harvest & post harvest losses, (iii) Strengthening of Library Information System through Networking (iv) Development of weather-based forewarning system for crop pests and diseases and (v) Expert system on extension; **AP Cess Fund** (i) Estimation of wool production – emerging data needs and a methodological reappraisal, (ii) Statistical study on competition effects among neighbouring units in field experiments, (iii) Technical efficiency analysis of rice-wheat system in Punjab, (iv) Lac marketing in India, and (v) Design & analysis of on Station and on Farm Agricultural Research Experiments: A Revisit; **Institute based** (i) Study of non-linear time series modelling in agriculture, (ii) Network of social scientists and (iii) Development of software for online information system on Personnel Management in ICAR; **Outside Institute** A millenium study entitled, “Information support for management of agriculture – state of Indian farmers, funded by IIM, Ahmedabad.

I am happy to note that our colleagues received academic distinctions during the year. Dr. Seema Jaggi received Lal Bahadur Shashri Young Scientist Award of ICAR for the Biennium 1999-2000. Dr. Rajender Parsad received Young Scientist Award for Social Sciences from National Academy of Agriculture Sciences for the Biennium 1999-2000. Shri H. Ghosh received ISAS Young Scientist Award 2001. Dr. Rajender Parsad & Dr. Seema Jaggi received appreciation from PG School, IARI, New Delhi as excellent teachers in the discipline of Agricultural Statistics while Shri KC Gupta received the same in the field of Computer Application. Dr. VK Bhatia was selected for Prof. DN Lal Memorial Lecture Award of ISAS. Dr. Sushila Kaul received Women of the Year 2001 Award from the American Biographical Institute. I would like to place on record the appreciation of their achevements for bringing laurels to the Institute.

This report has been compiled through collective effort rendered by Heads of Divisions, scientists and other staff of this Institute. I wish to express my sincere appreciation to all of them for their sincere and whole-hearted support and cooperation in carrying out various functions and activities of the Institute.

I express my appreciation to Dr. AK Srivastava, Joint Director, Dr. DK Agarwal, Principal Scientist In-charge (RCMU), Sh. PP Singh, Technical Officer (T-6) for compilation, editing and for bringing out this report in time. My thanks are also due to Sh. Mahesh Chander, Personal Assistant and Smt. Rajni Gupta, Sr. Clerk for type-setting the manuscript on computer.

I hope this publication will be of immense use and informative for the scientific fraternity of NARS. Suggestions and comments, if any, for improvement in subsequent volumes of the report are most welcome.

(SD SHARMA)
DIRECTOR

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SUMMARY

CHAPTER -1

EXECUTIVE SUMMARY

Indian Agricultural Statistics Research Institute (IASRI) established in 1959 as an Institute of Agricultural Research Statistics was mainly responsible for promoting and conducting research and education/ training in Agricultural Statistics. With the advances in information technology the institute has adapted itself to the current needs of agricultural research. In the changed scenario, the mandate of the Institute is, to undertake basic, applied and adaptive research in agricultural statistics, to assist in the development and strengthening of National Agricultural Statistics System, to conduct post graduate and in-service training courses in Agricultural Statistics and Computer Applications, to provide consultancy services, to act as a repository of information on agricultural statistics, to develop the Institute as an Advanced Centre of Excellence in education and training in Agricultural Statistics and Computer Applications and to liaise with other ICAR Institutes and SAUs, State Agricultural/Animal Husbandry Departments and to undertake sponsored research and training of national and international organisations in these disciplines.

A number of research projects were undertaken in the different divisions of the Institute namely Sample Survey, Design of Experiments, Biometrics, Forecasting Techniques, Econometrics and Computer Applications. During the year under report, there were forty-eight on-going research projects in the Institute out of which twelve were Institute based, fourteen were in collaboration with other institutions under NARS, ten were funded through AP Cess Fund, three were outside funded, seven NATP, one revolving fund and one CAS project. Main thrust areas of the Institute are, remote sensing and geographic information system, assessment and evaluation studies, production and area estimation, cost of production studies, cropping system research, information system for agricultural and animal experiments, experimental designs for agricultural, animal, agro-forestry and fisheries research, computer simulation studies and applications of re-sampling techniques like bootstrap, jackknife, balance repeated replications in agricultural statistics, studies on gene action, estimation of genetic parameters and genetic merit, genetic progress and other related statistical methods, non-linear statistical modelling of biological, ecological and economic phenomena, forecasting techniques in agricultural system, technological change, risk and uncertainty in agriculture, food security, modelling for agricultural marketing, development of data bases and information system for National

Agricultural Research System (NARS).

The Division of Sample Survey is mainly involved in the development of sample survey techniques for estimation of various parameters of interest relating to crops, livestock, fishery and allied fields. The Division is currently working on eight research projects covering the thrust areas i) remote sensing and geographic information system, (ii) assessment and evaluation studies, (iii) production and area estimation and (iv) cost of production studies. The beneficiaries of these research projects as well as consultancy are spread over the Institutes in National Agricultural Research System, State Departments of Agriculture; Directorate of Economics & Statistics, Department of Animal Husbandry & Dairying in Ministry of Agriculture; Central Statistical Organisation and National Sample Survey Organisation etc.

A mission mode NATP project entitled "Assessment of harvest and post harvest losses" has been initiated. The main objective of the study is to assess the losses at producer, consumer and market level for the commodities namely: milk, fisheries, oilseeds, wool, meat & poultry.

A new project entitled "Estimation of wool production – emerging data needs and a methodological reappraisal" under AP Cess fund of ICAR was initiated in collaboration with CSWRI, Avikanagar with the objectives to modify the existing sampling methodology for estimation of breed-wise sheep number, average wool yield, total wool production and seasonal variation at district level and also to study the various sheep rearing practices prevailing in different regions.

The AP Cess fund project entitled "Sampling procedure for selection of representative samples of fertilisers from ship" has been completed. A suitable sampling methodology for selection of representative samples of fertilisers for quality check has been suggested. The sample sizes required for determining moisture content and particle size of Diammonium Phosphate (DAP) and Murate of Potash (MOP) fertilisers have also been suggested.

A small scale study entitled "Crop yield estimation at block level using farmers' estimates" on wheat crop in Karnal district has been completed. The relative accuracy of crop cut estimates vis-à-vis farmers' estimates of yield of crop has been examined. Suitable block level estimates of average yield using both the crop cut estimates and farmers' estimates in the form of double sampling regression estimates have also been suggested.

A Small Area Crop Estimation Methodology (SACEM) required for National Agriculture Insurance Scheme has been suggested. The methodology has been adopted by the Ministry of Agriculture on pilot basis in different states.

The Ministry of Agriculture, Govt. of India is carrying out a study entitled "State of the Indian Farmer- a Millennium Study" to enquire the economic conditions of the Indian Farmers at the dawn of the new millennium. As a part of this study a status paper entitled "Information support for management of

Agriculture" is being prepared.

One International training programme sponsored by Food and Agriculture Organisation for the participants from Eritrea was organised. The Division organized a training programme on "Sample Surveys related to the estimation of area and production of fruits and vegetables". A "Workshop on Economic Accounts for Agriculture" was jointly organised by the Food and Agriculture Organization (FAO) of the United Nations and the United Nations Statistical Institute for Asia and the Pacific (SIAP) at the Institute. A compendium on 'Methodologies at a glance' has been prepared. Initiation for a NATP laboratory under mission mode NATP project has also been made to develop the infrastructure in the Division.

The Division has taken the lead in publication of Agricultural Research Data Book since 1996. The Agricultural Research Data Book 2001, which was fifth in the series, has been published and widely distributed among the National Agricultural Research System. The Agricultural Research Data Book 2002 has also been prepared.

The Division of Design of Experiments is responsible for developing statistical designs and methodologies for the analysis of data relating to field and laboratory experimentation in agricultural and animal sciences. The scientists of the Division have worked on thirteen research projects covering the thrust areas (i) cropping system research, (ii) information system for agricultural and animal experiments, and (iii) experimental designs for agricultural, animal, agro-forestry and fisheries research. Besides these projects, the scientists have also been involved in other projects of the Institute.

The data received from different collaborative projects under AICRP during the year were analyzed with appropriate statistical techniques. One status report entitled 'Planning designing and statistical analysis of data relating to experiments conducted under the AICRP on Long-Term Fertilizer Experiments (2001) was prepared and published. A status paper on Designing and Analysis of Experiments conducted under AICRP on STCR was also prepared.

The division has also developed a linear programming approach for estimating/projecting the energy requirement in agricultural sector. The approach uses the maximization of yield subject to the constraints on the availability of energy from different sources like Human Labour, Animal Labour, Diesel, Electricity, Seed Rate, Farm Yard Manure (FYM), Fertilizer, Chemicals, Machinery, Total Energy, etc. The procedure has also been used for minimization of total energy for obtaining a given level of yield. The concept of energy use efficiency has also been introduced. This technique is now being used by the All India Coordinated Research Project on Energy Requirement in Agricultural Sector, CIAE, Bhopal.

Two scientists of the Division have received the Young scientist Award, one from the National Academy of Agricultural Sciences and the other from ICAR for the biennium 1999-2000. Best poster presentation award for the paper entitled 'Minimal balanced repeated measurement designs, was bestowed during the 89th Session of Indian Science

Congress.

The Division of Biometrics is responsible for conducting research/ teaching in the field of Biometry. The scientists of the Division have worked on six research projects covering the thrust areas (i) Computer simulation studies and applications of resampling techniques (ii) Studies on gene action, estimation of genetic parameters and genetic merit etc., and (iii) Nonlinear statistical modelling of biological and ecological phenomenon. One scientist of the Division received ISAS Young Scientist Award 2001.

A training programme under Centre of Advance Studies on 'Biometrical methods for agricultural research' was organised keeping in view the importance of interaction among research statisticians, scientists and faculty of other disciplines in various ICAR Institutes and State Agricultural Universities. The programme provided opportunities for exchange of views, discussion of current problems and establishing linkages with institutions under NARS, dwelt upon some recent advances in Biometrics and other statistical and computing tools useful in analysis of data in agriculture.

The Division of Forecasting Techniques has worked on nine research projects covering the main thrust area of forecasting techniques in Agricultural System. A project on development of early warning and yield assessment models for rainfed crops based on agrometeorological indices has been completed. This study was conducted for rainfed crops for Rice, Sorghum and Maize utilising weekly rainfall and pan evaporation data for past 20 to 23 years and corresponding district yield. Water balance technique was used to estimate weekly stress to the crop and appropriate weights for stress were determined for stress at different stages of growth and accumulated weighted stress indices were prepared to develop forecast models. These models provided forecast, six weeks before harvest for sorghum, four weeks before harvest for maize and five weeks before harvest for rice. The models were validated. Results show that the technique requires further refinement for rice crop.

In another completed project on "Forecasting fish production from ponds" two types of models namely Multiple regression model & Non-linear model were developed. In Multiple regression model, fish weight at harvest was regressed on pH value, dissolved oxygen etc. The models were fitted through stepwise regression. The results indicated that there was tremendous improvement in the forecasts under the assumption of heterocedasticity with auto correlation of error variance.

Besides, there were four continuing projects/studies on "Forecasting the loss in yield due to weeds", "Development of forewarning system for major pests and insects for mango and paddy" a Cess fund project "Pilot study on forecasting of brood-lac yield from Butea monosperma (Palas) and "Development of forecast model using multiple Markov Chain".

The Division was associated in a Mission Mode project under NATP entitled, "Development of weather based forewarning systems for crop pests and diseases". The project has been undertaken with the objective to develop weather based forewarning systems for major insects pests and diseases for

rice, sugarcane, pigeon pea, cotton, mustard and groundnut.

The Division of Econometrics has worked on four research projects covering the thrust areas (i) study of technological change, risk and uncertainity in Agriculture, (ii) study on food security and (iii) modelling for agricultural marketing. A project on Econometric Study of Technological Dualism in Egg Production is in collaboration with the Department of Animal Husbandry, Government of Punjab. Another project on Household and Nutritional Food Security in Tribal, Backward and Hilly Areas is funded from NATP. During the period under report, two new projects on Technical Efficiency Analysis of Rice-Wheat System in Punjab and "Study of Lac Marketing in India" were initiated. A Summer School entitled "Quantitative Techniques in Production Economics Research" was organised by the Division. One scientist received Women of the Year 2001 Award from the American Biographical Institute, North Corolina, U.S.A.

The Division of Computer Application has worked on seven research projects covering the thrust areas (i) development of databases and information system for National Agricultural Research System (NARS) and (ii) conduct post graduate teaching and ad-hoc training courses in Information Technology. Under a NATP project "Institutionalisation of Research Priority Setting, Monitoring and Evaluation and Networking of Social Scientists", Guidelines for Monitoring and Concurrent Evaluation has been finalised. Project Information and Management System (PIMS), containing M & CE module has been implemented at various locations of the NATP sub-projects. PIMS provides information on the projects under the NATP programme and can be used for monitoring and evaluation of research projects. A website for Agricultural Statisticians has been launched (URL is **http://iasri.delhi.nic.in/ASN/**). A web based on-line system NISAGENET for National Information System on Agricultural Education in India, has been designed and is being developed. A new project "Integrated National Agricultural Research Information System (INARIS) under Mission Mode of NATP and related to development of a central data warehouse at IASRI, New Delhi has been initiated. The Division organised 24 training programs, of which 23 training programs were under the Revolving Fund Scheme and one training program under CAS. It continued to provide computer services as well as strengthened the computing facilities in the Institute.

Research Coordination and Management Unit (RCMU) is responsible for documentation and dissemination of scientific output of the Institute. During the year RCMU organised XIII National Conference of Agricultural Research Statisticians held at PAU, Ludhiana, meetings of SRC, RAC, QRT and Senior Officers (SOM) of the Institute. Some other functions of the Unit are: X Plan Proposal, correspondence with ICAR HQs and its Institutes, SAUs and other organisations in India and abroad from time to time, publication of Annual Report, Newsletters, to examine the new Research Project proposals before these are considered by the SRC, to monitor the progress of on-going research projects and to bring out half yearly monitoring progress reports, to prepare Annual Action Plan, Activity

Milestone, EFC Memo and to maintain the Research Project Files for submission to ARIC (ICAR). The Unit also provides help in Art, Photography & Reprographic Services.

Training Administration Cell (TAC) is responsible for planning, organisation and co-ordination of the entire Post-graduate teaching programmes of the Institute in collaboration with PG School, IARI, to provide guidance to students in their research/training programmes, ad-hoc training courses on specialised topics in Agricultural Statistics & Computer Applications and training courses under the aegis of Centre of Advanced Studies in Agricultural Statistics & Computer Applications.

The scientists of the Institute participated in a number of workshops, seminars, summer Institutes related to the disciplines of agricultural statistics and computer applications. A number of research papers highlighting the results achieved in various studies were published by the scientists of the Institute. Consultancy was also given to different organisations/NARS during the period.

CHAPTER -2

INTRODUCTION

Brief History

The Institute made a modest beginning in 1930 as a small Statistical Section in the then Imperial Council of Agricultural Research to assist the State Departments of Agriculture and Animal Husbandry in planning their experiments, analysis of experimental data, interpretation of results as also rendering advice on the formulation of the technical programmes and examining the progress reports of the schemes funded by the Council. The activities of the Section increased rapidly with the appointment of Dr PV Sukhatme as Statistician to the Council in 1940 and researches were initiated for developing objective and reliable methods for collecting yield statistics of principal food crops. The efficiency and practicability of these methods were demonstrated in different States for estimating yield by crop cutting experiments. The result was such that, in the course of a few years, the method was extended practically to the entire country to cover all principal food and non-food crops. Research in sampling theory and training of field and statistical staff were the activities initiated in this period resulting in the re-organization of the Statistical Section into a Statistical Branch in 1945 with appropriate expansion in its strength. The designation of Statistician was changed to Statistical Advisor. The Statistical Branch soon acquired international recognition as a centre for research and training in the field of Agricultural Statistics. During 1952 on the recommendations of two FAO experts, Dr Frank Yates and Dr DJ Finney who visited the Council on the invitation of the Government of India, activities of the Statistical Branch were further expanded and diversified. Subsequently, in recognition of its important role as a training and research institution, the Statistical Wing was re-designated as the Institute of Agricultural Research Statistics (IARS) on 2nd of July 1959. An important landmark in the development of the Institute was the installation of an IBM 1620 Model-II Electronic Computer in 1964. Another major land mark for the Institute was the signing of a memorandum of understanding with Indian Agricultural Research Institute (IARI), New Delhi in 1964, consequent to which new courses leading to MSc and PhD degrees in Agricultural Statistics were started in collaboration with IARI in October, 1964. In April, 1970, the Institute was declared as a full-fledged Institute in the ICAR system and is since then headed by a Director. Since 1st January, 1978 the name of the Institute was changed to Indian Agricultural Statistics Research Institute (IASRI)

emphasizing the role of 'Agricultural Statistics' as a full fledged discipline by itself.

Since the activities of the Institute expanded manifold, a new three-storeyed Computer Centre building was constructed in the campus of the Institute in 1976. A third generation computer Burroughs-4700 system was installed in March, 1977. A large number of computer programmes for specific problems as also general purpose application software were developed. The old Burroughs B-4700 system was replaced in 1991 by a Super Mini COSMOS-486 LAN Server with more than hundred PC/AT's, PC/XT's and dumb terminals all in a LAN environment. Later, COSMOS-486 LAN Server was replaced by a PENTIUM-90 LAN Server having state-of-art technology. Computer laboratories equipped with PCs, terminals and printers, etc. had been set up in each of the six divisions as well as in Administrative Wing of the Institute. User friendly software packages like SPSS, Image Processing Software, Harvard Graphics, LOTUS, dBASE IV, MS DOS, UNIX and a few others have also been made available.

In order to remove and rectify deficiencies in the existing documentation services dealing with agriculture, the Food and Agriculture Organisation of the United Nations initiated a series of studies in 1971, to establish the Information System for Agricultural Sciences and Technology (AGRIS). The Institute is one of the National input centres, for adding our inputs to the System every month. The Institute provides selective information services to scientists in the ICAR Institutes and Agricultural Universities on references to documents relating to areas of their specific interest. The bibliographic databases in Biotechnology and Animal Science Research are being maintained in the Bio-Informatics Laboratory providing Selective Dissemination of Information (SDI) services on VETCD, BEASTCD and AGRICOLA databases.

From October, 1983 to March, 1992 the Institute also functioned as a Centre of Advanced Studies in Agricultural Statistics and Computer Applications under the aegis of the United Nations Development Programme (UNDP). This programme aimed at developing a Centre of Excellence with adequate infrastructure and facilities to undertake advanced training programmes and to carry out research on various aspects of agricultural statistics and computer application. Under this programme, thirteen distinguished statisticians and computer experts from abroad visited the Institute for a period of four to eight weeks with a view to interacting with the scientists of the Institute, giving seminars/lectures and suggesting improvements in the research programme of the Institute. Seventeen scientists from this Institute had received training abroad, in different areas of research, extending over periods of 5-6 months each. In addition, a new course leading to M.Sc. degree in Computer Application in Agriculture was initiated from the session 1985-86 which was subsequently changed into M. Sc. (CA) from the session 1993-94. The Center of Advanced Studies in Agricultural Statistics and Computer Application as approved by the Education Division of ICAR was re-established at IASRI in 1995.

A lab on Remote Sensing (RS)

and Geographic Information System (GIS) has been developed consisting of WINDOWS, NT Server, Two Nodes - Pentium III, venturis FX-2, 5166, Monitor 21" (Color), Ethernet Hub, Digitiser, SG V A0 size, EPSON Stylus color Printer 1520, Workstation Wipro Grafika Pentium III, Node Pentium III Wipro Mentor as hardwares and ER Mapper 5.5, PC ARC/INFO, Microstation 95, Geomedia Professional, ARC/INFO, Workstation 7.2.1, ERDAS Imagine 8.3.1 as softwares in the institute with the help of funds received through two AP Cess Fund projects.

Keeping an eye on the technological developments in the Information Technology (IT) field, the new operating systems and the large number of machines connected on the network, it was necessary to upgrade/ replace the existing computer hardware and also purchase new computers. Accordingly, 4 Server with 3 Nodes, and necessary peripherals, Laser Jet Printers, Note Book Computer, Desk Jet Printer, A-4 Size Scanner, CD-Writer, two video projection equipment were procured and installed. User friendly software packages like operating system MS Windows 95, Word Perfect, E-mail Services, SAS, Image Processing Software, SCO-UNIX, ORACLE, MS-Office Suite, Microsoft Visual Studies 97, Microsoft Office 97, Microsoft Project 98, STAR3, Norton Anti-virus packages, and a few others have also been made available. Borland Turbo C++, Geo Media Software were also purchased to keep pace with the new emerging technology. Besides this, every administration and accounts section of the Institute has been equipped with PC AT's and printers.

With the advances in Information Technology and the requirements at IASRI, the new structured cabling for 65 nodes at IASRI's computer center building using the world standard AMP products was done under the ARIS programme. The 65 nodes with the transfer speed of 100 MBPS were installed and for managing all these nodes the "NETCONNECT" rack was installed where the cables from different rooms terminate and the patch cords from these are used to connect 24 Port Bay Networks hubs. The two new 24 port Bay Networks hubs along with the existing two 16 port hubs were mounted on the rack for managing the whole network. All the four hubs are now cascaded and with this the Internet connection has become much faster. The existing LAN has been strengthened by extending connectivity to 68 nodes using the structured cabling. In all 202 nodes are now on the network. Email and Internet services are now available to all the scientific/ administrative staff in the Institute.

In view of growing demand from various quarters, the Institute revived the Senior Certificate Course in 'Agricultural Statistics and Computing' in 1997 with appropriate changes in the course curriculum keeping in view the demand of well trained manpower in Agricultural Statistics alongwith adequate knowledge in Computer Application.

The Institute has achieved international recognition for its high quality research and teaching work in the field of Agricultural Statistics. A number of research workers from the Institute have served as consultants and advisors in Asian, African and Latin American countries. Also, a number of statisticians and students of the Institute are at present occupying high positions in universities and other academic and

research institutions of USA, Canada and other countries.

Organisational Set-up

The Institute has the following six Divisions, one Unit and one Cell to undertake research, training, consultancy, documentation and dissemination of scientific output:-

Divisions

- Sample Survey,
- Design of Experiments,
- Biometrics,
- Forecasting Techniques,
- Econometrics,
- Computer Applications.

Unit

- Research Co-ordination and Management.

Cell

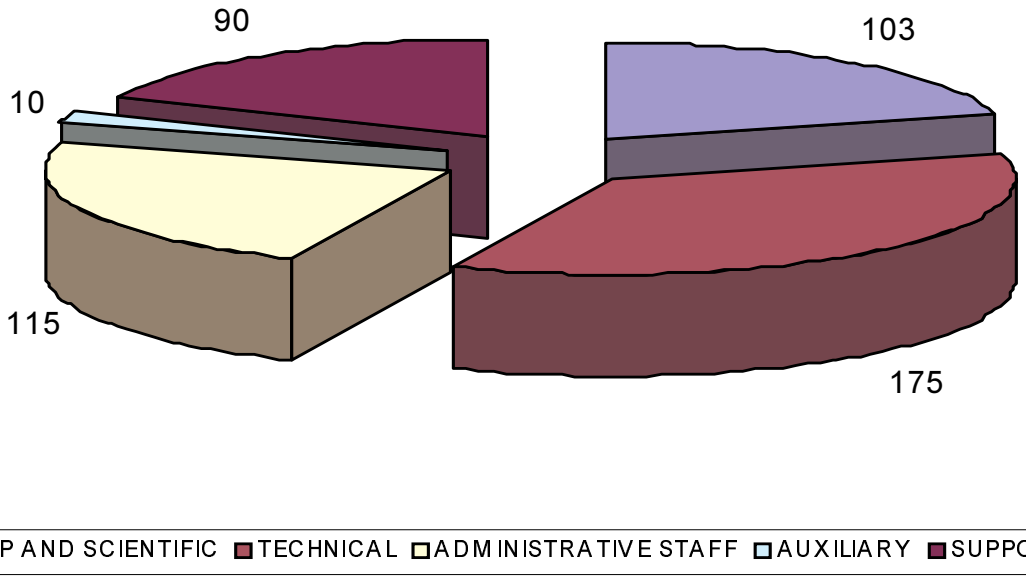
- Training Administration.

Staff Position
(As on 31.03.2002)

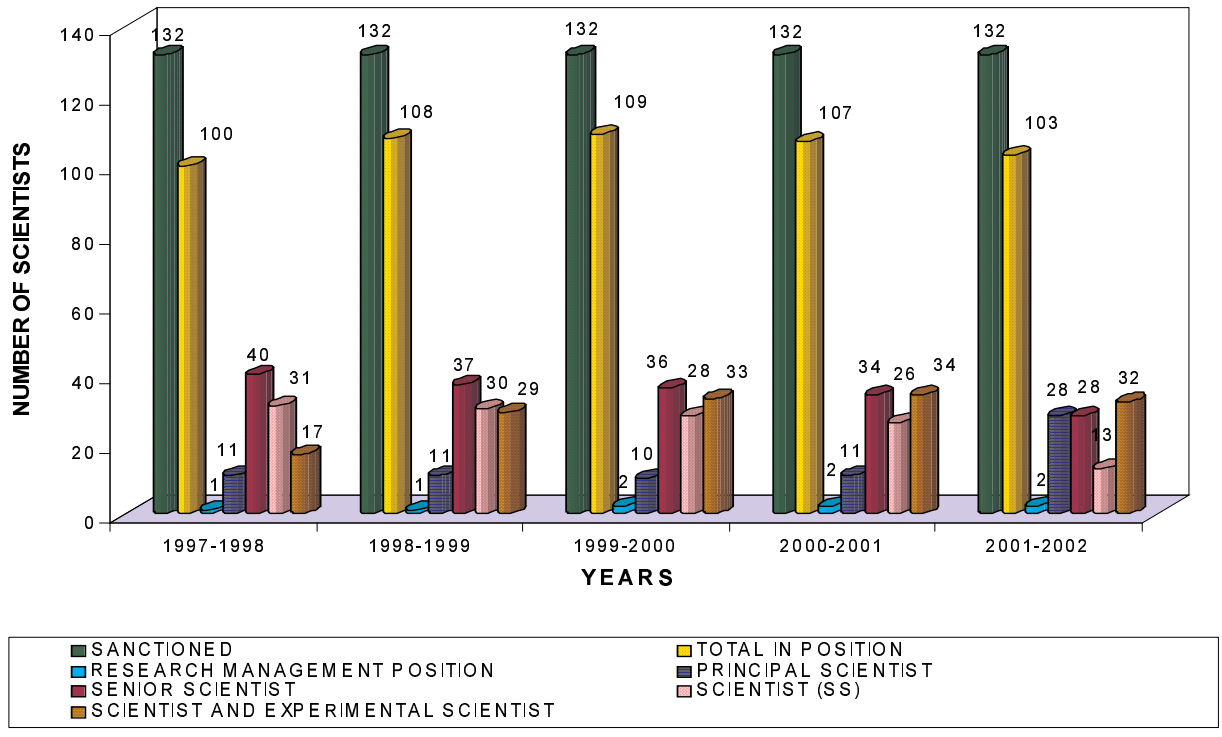
Sr. No.	*Manpower*	*No. of posts sanctioned*	*No. of posts filled*
1.	Director	1	1
2.	Joint Director	1	1
3.	Scientific	130	101
4.	Technical	277	175
5.	Administrative	114 (7*)	115*
6.	Auxiliary	14	10
7.	Unclassified	1	-
8.	Supporting	93	90
	TOTAL	**631 (7*)**	**493**

*after reduction, the cadre strength of seven administrative posts (three Steno Grade-III, one Assistant, one UDC and two LDC's). The cut of five posts (3+1+1) would be effective from the date of superannuation.

STAFF STRENGTH IN POSITION AS ON MARCH 31,2002



SCIENTIFIC STRENGTH (SANCTIONED AND IN POSITION)
FOR THE YEARS FROM 1997-98 TO 2001-02



Financial Statement

Budget allocation vis-à-vis Expenditure (2001-02)

(Rupees in lakhs)

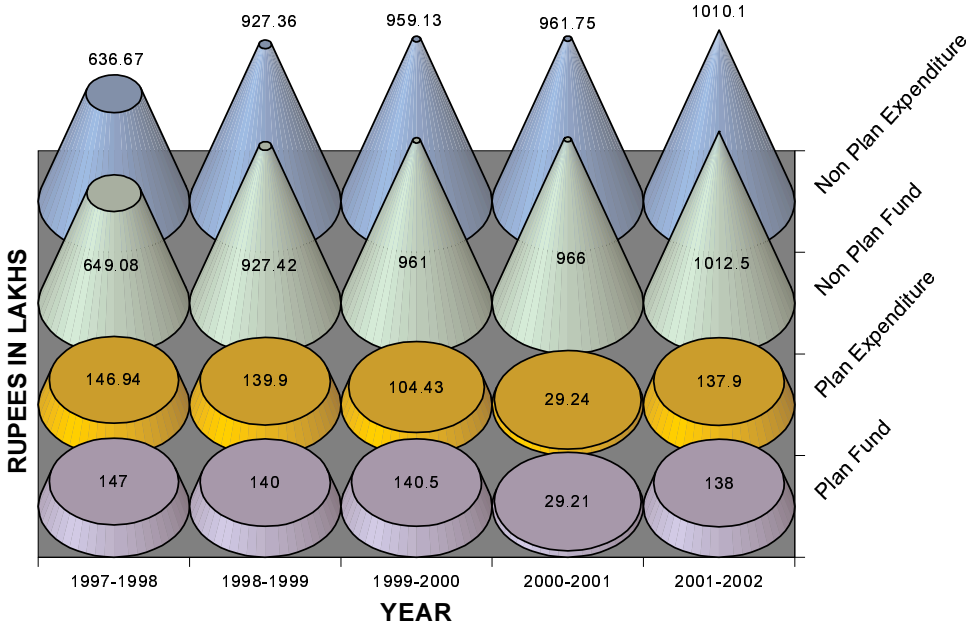
Head of Account	Budget		Expenditure	
	Plan	Non-Plan	Plan	Non-Plan
Establishment Charges	-	889.00	-	886.80
Overtime Allowance	-	0.90	-	0.90
Travelling Expenses	2.50	3.30	2.50	3.30
Other Charges Incl. Equipment	33.50	90.80	33.42	90.80
One time catch up grant for equipment	2.05	-	2.04	-
Works	74.60	18.00	74.61	17.95
One time catch up grant for renovation Repairs (works)	22.70	-	22.68	-
Fellowships/Scholarship/Award/HRD	2.65	10.50	2.65	10.35
GRAND TOTAL	**138.00**	**1012.50**	**137.90**	**1010.10**

Abstract (2001-02)

(Rupees in Lakhs)

	Budget	Expenditure
Plan (including one time catch up grant)	138.00	137.90
Non-Plan	1012.50	1010.10
TOTAL	**1150.50**	**1148.00**

BUDGET FOR THE YEARS FROM 1997-98 TO 2001-02



SAMPLE SURVEY

CHAPTER -3

RESEARCH ACHIEVEMENTS

DIVISION OF SAMPLE SURVEY

Mandate	Thrust Areas
To evolve sample survey techniques for estimation of various parameters of interest relating to crops, livestock, fishery, forestry and allied fields and to develop techniques for analysis of survey data.	• Remote sensing and geographic information system • Assessment and evaluation studies • Production and area estimation • Cost of Production Studies

Thrust area-wise list of projects in operation is given in Chapter 11. The progress of the projects is given below:

Remote Sensing and Geographic Information System

1. Study of land use statistics through integrated modeling using geographic information system (Funded through A.P. Cess Fund, ICAR)

The objectives of the project are i) to obtain land use statistics with the help of survey and remote sensing technique ii) to study the qualitative aspect of land utilisation statistics obtained through different sources i.e. census, survey and remote sensing and iii) to develop model for integration of statistics obtained through different sources.

Different land use statistics are to be estimated separately for each of the categories of the nine-fold classification using survey data and remote sensing data. The quality of statistics obtained through all these three basic sources of data for the same land use categories are to be compared with the help of statistical tools in terms of magnitude and characteristics of different kinds of errors. The relationship between different sources of data is to be studied. Three different sources of data would be interacted using the approach proposed by Arbia (1993) and Arbia & Hainning (1989). An attempt is to be made to estimate and eliminate different kinds of errors in the various sources of data, again with the help of GIS software as it is capable of storing and overlaying the different sources of data with the help of geographical coordinates. In the development of this integrated stochastic model the survey data will be treated as true value and the relationship of different kinds of data sources would be exploited to minimize various kinds of errors. Using the model, the land use

statistics of the other non-surveyed part of the region can be obtained with reliable degree of precision. Technical advice from All India Soil & Land Use Survey, Ministry of Agriculture would be sought where necessary. The data for this study will be obtained from National Remote Sensing Agency, Hyderabad.

The field work pertaining to the selected villages of Lalitpur, Mehroni and Tal Behat tehsils of Lalitpur district for the Rabi, Kharif and Jaid seasons is over. The work of ground truth verification for these seasons is completed. Database related to the field survey has also been prepared for selected villages and scrutiny of the data is in progress. Patwari record is obtained from revenue department for all the three seasons & the work of conversion of patwari records in digital form is in progress. Satellite data for Rabi, Kharif and Jaid seasons from NRSA Hyderabad is also procured. Final maps for population density and forest density have been prepared. The work of overlay of digitized data on satellite data and georeferensing of satellite data is in progress.

2. Development of GIS based technique for identification of potential agro-forestry area

The objectives of the project are i) to identify the important factors responsible for growth of agroforestry and ii) to construct the suitability index using Spatial-Analytic Hierarchy Process and iii) to compare the above mentioned index with the Composite development index.

A pilot study on agro-forestry/ social forestry has been conducted in Yamunanagar district of Haryana by the institute. In this study, exhaustive information related to agro-forestry has been collected. Villages were divided into two different categories (1) villages having common boundaries with the forest and (2) rest of the villages. The data are available from each category of the villages. Additional data in respect of different factors correlated with the factors responsible for growth of agro-forestry would be obtained from population census, livestock census, land use statistics etc. This data would be suitably analysed to identify the major factors affecting the growth of agro-forestry.

Technological advances in computation have fulfilled the need for computers in integrating data from a variety of sources, in manipulation and analyzing data in providing output, which could be used as part of a decision-making process. The need of classified information has given birth to the specialized branch of information system like Geographic Information System (GIS). Once, the important factors responsible for growth of agro-forestry are identified, an analytic environment provided by GIS and a decision-making method provided by Analytic Hierarchy Process (AHP) would be used for identifying potential agro-forestry areas. Attempts would be made to compare the suitability index developed using Spatial-AHP for each village of the district with the composite development index of the village.

It is expected that the methodology developed in this project would help in identifying the potential zones of agro-forestry systems. This study would develop a reliable and speedy technique/tool for the planning, management and development of agro-forestry with the help of recently available computer technology.

All the villages of Chhachhrauli as well as Jagadhari Tehsils have been digitised separately using Tehsil maps available in the District handbook of Census (1991) of Yamunanagar district. Analytic Hierarchy Process (AHP) has been developed using the identified factors responsible for growth of agroforestry. Development of Spatial-AHP which would combine GIS and AHP to identify and rank potential agroforestry areas using data contained in GIS maps, is in progress. Development of village development indices is also in progress. The digitised Tehsil maps are to be joined together for attaching attribute data corresponding to each village of the district with the maps. For joining the maps, georeferencing is must. Georeferencing of the maps is also in progress.

Assessment and Evaluation Studies

3. Assessment of harvest and post-harvest losses – a mission mode project under NATP

The objectives of the project are (i) to conduct a pilot study to assess the harvest and post harvest losses of oilseeds at different levels (Producer, consumer and market); (ii) to conduct a pilot study to assess the production and post production losses of milk at different levels (Producer, consumer and market); (iii) to conduct a pilot study to assess the production and post production losses of wool at different levels (Producer, consumer and market); (iv) to conduct a pilot study to assess the production and post production losses of meat at different levels (Producer, consumer and market); (v) to conduct a pilot study to assess the production and post production losses of eggs and poultry meat at different levels (Producer, consumer and market); (vi) to conduct a pilot study to assess the production and post production losses of marine fishery at different levels (Producer, consumer and market) and (vii) to conduct a pilot study to assess the production and post production losses of Inland fishery at different levels (Producer, consumer and market).

It is proposed to select one district for each commodity preferably nearby respective co-operating centre related to a particular commodity. So in total 7 districts would be selected for the pilot study. In each district study would be confined to one commodity only. Further, 8 villages and 2 urban localities from each district would be selected randomly. Again, from each selected area 10 households would be selected at random. The ultimate number of sampling units i.e. households for the study would be 700. The data related to one related agricultural commodity would be collected from each household through a well-designed questionnaire. For the field data collection, attempt would be made to employ the unemployed graduates from the same district as they are likely to be well versed with the geographical locations as well as the regional languages. This would also generate employment to them for a short period. In case of practical difficulties some suitable agencies would be entrusted to collect the data on contractual basis. After collection, the data would be scrutinized, coded, digitally transferred to the computers and analyzed. A common software would be developed for the data entry and analysis of data. The percentage losses would be estimated at consumers as well as producers levels for all these agricultural commodities through enquiry method from these households. To estimate the extent of losses at market level, separate

questionnaire would be made for each commodity and data would be collected from different storage systems, wholesalers, and retailers from each selected district for a particular commodity. Information regarding the transportation losses would also be collected from the above sources along with mode of transportation systems.

Launch workshop was organized at lead centre, IASRI on April 11, 2001. Visits were made by the Scientists of the lead centre to different cooperating centers for project detailing and preliminary discussions were also held for preparation of schedules for primary data collection. Commodity-wise meetings were held at the lead centre with the CCPI's and associates of all cooperating centres during August 2001 for discussing the schedules and project detailing prepared by the CCPI's. The first interaction workshop was organized at IASRI during Sept. 13-15, 2001 for finalizing the detailed document and schedules for primary data collection for different commodities. Sample sizes to be taken from different marketing channels were also decided. Recruitment of Senior Research Fellows (SRF), detailed project document, preparation of sampling frame and selection of samples, recruitment and training of field staff and software development for data entry were completed. Data collection and supervision of field work, training of developed software for data entry at different co-operating centres, testing and debugging of software, software development for data analysis and establishment of Computer Lab were in progress. Visits were made by the PI and associates of the lead centre to different co-operating centres for supervision of field work. Furniture, Air conditioners and Photocopy machine were procured. Procurement of computers and other equipments was in progress.

The future work plan of the project is as follows:

- To create awareness regarding the losses among the farmers, planners, policy makers, administrators for planning and implementing the programme related to these areas.
- To help in accelerating research efforts towards reduction of losses for these commodities.
- To help in focussing on household food security, poverty alleviation or equity.
- To help in improving crop production and protection programme

4. Sampling procedure for selection of representative samples of fertiliser from ships– Funded through A.P. Cess Fund, ICAR (Collaborative with Central Fertiliser Quality Control & Training Institute, Faridabad)

The objective of the project is to develop sampling methodology for selection of representative samples of fertilizer from ships for the purpose of quality check.

Sampling work was to be carried out at one major port and one minor port. At the major port sample was to be selected systematically directly from the hatches. At the minor port sampling of fertilizer was to be carried out at wharf. Here also as in case of major port samples were to be selected systematically. Generally, one sample is selected from each barge. Sample size would be determined by fixing the degree of precision and level of significance.

The Government of India is

importing different types of fertilisers. To ensure whether the imported material is as per specifications given in the supply order, it is necessary to have suitable procedure for checking the quality of fertilisers.

The ICAR ad-hoc scheme entitled "Sampling procedure for selection of representative samples of fertilisers from ship" was undertaken in pursuance of the decision taken by the expert committee on specification of imported fertilisers to review the existing methodology of drawl of samples of fertilisers from vessels arriving at the Indian ports.

The objective of the study was to develop a sampling methodology for selection of representative samples of fertilisers from ships for the purpose of quality check. The primary data collection work in this study was carried out at two ports- one major port (Kandla) and one minor port (Kakinada). A systematic sampling design was proposed for the drawl of samples of fertilisers from the hatches of the ship. At minor ports the ship is anchored mid sea, accordingly the above sampling procedure was suitably modified.

The statistical analysis of the data carried out to test for significance of difference of means and variances of the hatches, in respect of physical parameters of fertiliser, namely, moisture content and particle size revealed no significant difference between hatch wise means and variances for fertiliser samples of Diammonium Phosphate (DAP) and Murate of Potash (MOP) collected at the Kandla port and Kakinada port respectively. The optimum values of the sample size worked out to 14 for Di-ammonium Phosphate and 30 for Murate of Potash for both the physical parameters.

5. Study relating to formulating long term machanisation strategy for each agro-climatic zone/State - Funded by Department Of Agriculture and Cooperation, Ministry of Agriculture

This is an outside funded consultancy project undertaken by the Institute. The project is funded by Department of Agriculture & Co-operation (DoAC), Ministry of Agriculture, Govt. of India. A brief introduction, sampling design and objectives of the project are as follows.

The programme envisages the conduct of an in-depth study, at micro-level, of the socio-economic, agro-climatic, agronomic, infrastructural and other relevant factors prevailing in the different agro-climatic zones of the country, which have a bearing on the spread of agricultural mechanisation, agricultural productivity therein; and formulation of appropriate long-term farm mechanisation strategies for the respective zones. It is likely that for a number of Zones / States, a single set of strategy / programme may not be uniformly conducive to the spread of farm mechanisation and all-round and sustainable agricultural development there. As such, appropriate packages of agricultural mechanisation strategies and programmes for the different Zones / States need to be formulated according to the present status, potential and future needs of agricultural mechanisation there.

The study is being conducted for each Agro-climatic Zone / State covering about 20% of the districts representing a mix of developed, developing and least developed pockets. The basic purpose is to have complete insight of the situation

and future needs in the direction of achieving full mechanization in a suitable time frame.

The sampling design would be Stratified Multi-stage Random Sampling. At present, the total number of districts in India is about 585, out of which a sample of 120 districts has been selected randomly with due consideration to mechanisation index of different districts within strata (State or group of States), following proportional allocation. From each selected district, a random sample of 40 villages has been selected. Accordingly, the total number of selected villages is 4,800. Keeping in view the level and adoption of mechanisation (holding-size wise), out of each selected village, a sample of 10 households has been selected. Hence, the total number of randomly selected households would be 48,000. The reference year is the year 2000-2001.

The objectives of the project are (i) to study the soil types, land topography; (ii) to study the socio-economic conditions (financial status) of the farmers and farm labourers and assess their capabilities for acquiring and adopting the needed agricultural equipment /machinery; (iii) to study the present status, ultimate potential, the gaps, highlighting critical ones; for equipment used in various agricultural operations starting right from tillage to the post-harvest operations; (iv) to study the types and utility of various agricultural equipment, both conventional and improved ones, presently in use and those needed in future, for different crops / cropping systems in the Zones; (v) to study the impact of farm mechanisation on employment of labour; (vi) to study the cropping pattern, both agricultural and horticultural, in the Zones, yields in relation to the national average, and their growth potential; (vii) to study and assess the use of farm power per hectare, ultimate requirement, ways and means to fulfill the gaps for various farm operations; (viii) to study the infrastructural facilities for the manufacture, marketing, after sale service/repairs availability etc. of agricultural equipment; (ix) to study and assess the adequacy and the requirement of infrastructure at the central and state levels, for planning, promotion, execution and extension of the various plan programmes on agricultural mechanization; (x) to identify new/ improved farm equipment that may be needed by the farmers during next 20 years i.e. by the year 2020, for carrying out different farm operations; (xi) to formulate strategies and programmes that may be required for mechanisation of agriculture during the period 2001-2005, 2005-2010, 2010-2015, 2015-20.

PHASE-I

The project started from July 2000. A Seminar–cum–Group Discussion to crystallise the approach and modalities of the project was organised at the Institute during July 24-25, 2000 under the chairmanship of Dr. B.S.Pathak, Director, SPRERI, Gujarat. Senior Officials from ICAR Hqrs.; CIAE, Bhopal; IARI, New Delhi; NBSS&LUP, Delhi Centre along with the scientists/officials of the Institute associated with the project participated in the Seminar–Cum–Group Discussion.

Keeping in view the objectives of the project, topics of different status papers have been finalised and letters relating to preparation of status papers

were sent to the experts, identified for the purpose.

For smooth functioning and monitoring of the project progress (technical, administrative & financial), a Project Management Committee (PMC) has been constituted under the chairmanship of Director, IASRI involving a senior official from ICAR also. So far six meetings of the PMC have been convened and various important issues, relating to the smooth functioning of the project, have been discussed and decided.

PHASE-II

Selection of 120 districts out of a list of 585 districts in the country, with due weightage to level of mechanisation within States/UTs has been completed. Lists of total number of villages in the 120 selected districts in various States/ UTs were procured and random selection of 40 villages in each of the selected district has also been completed.

For field data collection work, Co-operating Centres of AICRP on FIM (All India Coordinated Research Project on Farm Implements and Machinery), located at various States Agricultural Universities (SAUs) and ICAR Institutes, have been involved. The Institute Scientists made frequent visits to CIAE, Bhopal and held detailed discussions with Dr. G. Singh, Director, CIAE and Dr. M.M. Pandey, Project Coordinator, AICRP on FIM, in connection with working out modalities relating to field data collection work of the project.

Schedules for data collection at district-level, village-level and household-level as well as Instruction Manual have been finalised and printed. Training to the Research Engineers of 24 Centres (including 22 FIM Centers), relating to conduct of field data collection work including filling up of the schedules, has already been imparted by the Institute Scientists.

The required funds for data collection have already been transferred to all the 24 Centres. Field data collection work has commenced at 21 Centres covering about 100 districts. Training to the hired Field Investigators (unemployed graduates/village school teachers etc.) at 21 FIM Centres, has already been imparted and the similar trainings have to be imparted at other 3 Centres also.

PHASE-III

A group comprising of farm mechanisation experts under the chairmanship of Dr. B.S. Pathak, Director, SPRERI, Gujarat has been constituted for reviewing the work done through status papers. The results obtained through the All-India survey will enable us to assess the present status, potential and gaps in the level of adoption of farm mechanisation, which will be used for formulating long-term mechanisation strategy for each agro-climatic zone/ State.

Production and Area Estimation

6. Estimation of wool production – emerging data needs and a methodological reappraisal.

The objectives of the project are (i) to modify the existing sampling methodology for estimation of wool production; (ii) to estimate the breed-wise sheep number, average wool yield, total wool production and seasonal variation at district level with a

reasonable precision; (iii) to study various sheep rearing practices prevailing in different regions and (iv) to study the socio-economic status of farmers engaged in sheep rearing.

This study is proposed to be taken up in a phased manner. In the first phase, surveys is to be conducted in one district each in two major wool producing states of Rajasthan (Northern Region) & Karnataka (Southern Region) of the country. The data is to be collected as per sampling plan and analysed.

In the second phase, questionnaires are to be revised and additional wool producing states in plain and hilly regions of the country will be covered. In each phase the methodology used has to be in consonance with the approach followed in the integrated surveys for estimation of livestock products so that it can be implemented within the existing system of data collection.

The sampling plan is to use stratified multi-stage random sampling design with tehsils/taluks in the district grouped into four (04) strata on the basis of geographical contiguity and sheep population according to latest livestock census.

The primary sampling unit (p.s.u.) is the village whereas the unit at the second stage (s.s.u.) would be a flock having sheep and the third and ultimate unit of sampling would be a sheep. The selection at each stage is to be done with equal probability and without replacement. For estimating sheep number a sample of 5 percent of the p.s.u's are to be selected from each stratum. Each p.s.u. is to be completely enumerated and information on sheep number according to breed, sex, age and type of flock (stationary/migratory) are to be recorded. For detailed enquiry a sample of 20 p.s.u's would be selected and allocated to different strata on the basis of sheep population. From each of the p.s.u's selected for detailed enquiry a sample of 5 flocks having non-descript/local sheep and 2 flocks having cross-bred sheep would be selected for recording information on wool yield and other practices. Two rams (or one ram and one weather), two ewes and two lambs would be selected from each flock for recording wool yield of the individual sheep. The information on disposal of wool, sheep rearing practices adopted by the flock owners, their socio-economic status would also be recorded.

In addition to above all the sheep and wool extension centres, wool shearing centres and sheep breeding farms located in the district are also to be covered for recording wool yield and management practices under controlled conditions.

An important feature of the proposed plan is to utilise different data sources related to sheep breeding and rearing. It is expected to yield improvement in the precision of the estimates. Attempt would be made to compare the precision of the estimates for the proposed plan of work with the existing sampling schemes.

The field work under the survey was started on Sep. 07, 2001 in Bikaner district of Rajasthan after imparting training to field Investigators for the collection of data whereas in Kolar district of Karnataka, the field work started on Nov. 26, 2001. The field work at both the centres is still in progress.

7. A study for estimation of crop yield at block level using crop-cut and farmers' estimate

The Institute conducted a pilot survey on Crop Yield Estimation at Blocks Level Using Farmers' Estimates in district Karnal of Haryana State during 1998-99 in Rabi season on wheat crop in collaboration with Department of Agriculture, Govt. of Haryana to develop suitable block level estimates of yield using crop cut estimates and farmers' estimates.

The sampling design adopted for the study was the same as is being followed in General Crop Estimation surveys (GCES). Accordingly, the crop cut data collected under GCES was utilised for the purpose. Data on farmers' estimates of the yield was obtained from the same field selected for crop cutting under GCES. Two additional fields were also selected in the villages where crop cutting was done and the yield data were collected by inquiry from the farmer. Besides this, from each stratum (i.e. blocks) five additional villages were selected. Four cultivators from each of these additional villages were selected to collect yield data by inquiry. Thus, yield data for 87 villages were collected by crop cut as well as by inquiry while data from other 30 villages were collected by inquiry alone.

To develop block level estimates of average yield two different estimates were developed i.e. one based on simple average while the other was double sampling regression estimator utilizing the eye-estimated yields of the field as auxiliary information. Reduction in the standard error of the estimate to the order of 20 per cent was observed in the double sampling regression estimator over an estimator based on simple mean values. The optimum values of sample size were obtained at various stages of sampling by fixing the standard error at 5 per cent and minimizing the total cost. The reduction in the total cost of the survey to the extent of 45 per cent was obtained based on the optimum values of sample sizes in cases where there was high correlation between the farmers' estimate and the estimates obtained through crop cutting approach by adopting the double sample regression estimator. Also, cheaper the cost of obtaining the farmers' estimate compared to the crop cut estimates, greater was the percentage reduction in cost obtained by adopting the double sampling regression estimator over an estimator based on simple mean values.

Cost of Production Studies

8. A pilot study on cost of production of Coconut in Kerala– Funded from Coconut Development Board, Kochi, Kerala (Collaborative with Central Plantation Crops Research Institute, Kasaragod, Kerala)

The objective of the project are i) to build reliable and efficient estimates of cost of cultivation of coconut ii) to study the agricultural practice in Coconut and iii) to utilise the information collected in (ii) on input details to formulate more remunerative cultivation practice.

Coconut is a perennial crop. Perennial crops have large gestation period between initial investments and first output. In respect of coconut the local variety starts yielding approximately 8 years after planting. The stabilized yield is obtained after 10 years. Therefore, to work out the cost of cultivation it is necessary to work out the cost of establishment of the orchard, and apportion it as annual cost, as well as

the annual maintenance cost. Besides the frame preparation, input-output information has been collected in four rounds. The information on fixed assets of the cultivators has been collected in a separate round.

Data collection work for the survey has been completed. The estimation procedure has been finalized. The analysis of data is in progress.

The report writing work would be taken up after the analysis is over.

Project proposals submitted for financial support

The Division submitted two new project proposals for financial support:

1. Project proposal on "Crop yield estimation at small area level using farmers' estimates" was submitted to Central Statistical Organisation, Ministry of Statistics and Programme Implementation, New Delhi.

2. Project proposals on "Pilot Sample survey to develop sampling methodology for estimation of area, production and productivity of important flowers on the basis of market arrivals" was submitted to Central Statistical Organisation, Ministry of Statistics and Programme Implementation, New Delhi.

Miscellaneous

- The copies of the newly published AGRICULTURAL RESEARCH DATA BOOK 2001 were widely distributed among the National Agricultural Research System such as Members of ICAR Governing Body, Director General, Deputy Director Generals, Asstt. Director Generals, Secretary, ICAR, Financial Advisor, ICAR, Ex-Director Generals, National Professors, Distinguished Persons, Directors of ICAR Institutes, Vice-Chancellors/ Director (Research) of Central/State Agricultural Universities and Heads of other Research Organisations etc.

DIVISION OF DESIGN OF EXPERIMENTS

Mandate	Thrust Areas
To develop statistical designs and methodologies for analysis of data relating to field and laboratory experimentation in agricultural and animal sciences.	• Cropping systems research • Information systems for agricultural and animal experiments • Experimental designs for agricultural, animal, agroforestry and fisheries research

Thrust area-wise list of projects in operation is given in Chapter 11. The progress of the projects is given below:

Cropping Systems Research

1. Planning, designing and analysis of experiments planned on stations under the Project Directorate for Cropping Systems Research

The objectives of the project are (i) to identify the suitable statistical designs for conduct of experiments according to the technical programme formulated for the project; (ii) to develop suitable method of analysis for the identified designs and (iii) to statistically analyse the data of experiments conduced at 37 Cropping Systems Research centres

- The experiments are planned and conducted under four types of research programmes (i) development of new cropping systems (ii) nutrient management in cropping systems (iii) development of system based management practices (iv) maximum yield research.

- The data of about 300 experiments pertaining to 2000-2001 crop year were received during 2001-2002. Designs adopted for conduct of experiments during this year were RBD, Split plot, split-split plot, strip plot, factorial RBD, 3^2 x 2 in 6 plots per block; partially confounded, BIBD and Balanced confounded $4x2^2$ in 8 plots per block. Data was scrutinized to see whether the broad guidelines and instructions set for successful experimental programme were being reasonably followed or not. Evidences of violations of guidelines/instructions observed in the data were reported to the concerned centers and will be highlighted in the next technical report of the project. Data were analysed as per design adopted and preparation of final tables for inclusion in the Annual Report (PDCSR) is under progress. For concluding experiments statistical

analysis over years was taken up and will be a part of technical report.

- Besides the Annual Report published by PDCSR, Technical Report (1997-2002) is under preparation highlighting the shortcomings in designing, layout of experiments and reporting of data. Statistical analysis over years for the concluding experiments is under progress.

- Under the first research programme intensification and diversification in the existing predominant cropping systems was studied at different centres. Intensification of predominant rice -wheat cropping system at Pantnagar by adding green gram during summer shows that it has not only increased the net return by 18% but also land use efficiency by 43% and production efficiency by 18%. Diversification by replacing wheat with other crops like Toria and Vegetable Pea reveals that it is not economical, thus reducing the production efficiency also.

2. Planning, designing and analysis of "ON FARM' research experiments planned under Project Directorate for Cropping Systems Research.

The objectives of the project are (i) to provide suitable sampling plan and design for layout of experiments on cultivator's field; (ii) to develop appropriate statistical methods of analysis for the experiments and (iii) to analysis the data of experiments conducted at 32 NARP zone centres during the year.

- Under the technical programme, three types of field experiments are conducted in system mode viz. (i) Response of nutrients (N, P and K) , (ii) sustainable production model and (iii) intensification and diversification of the existing cropping system. The proforma for data collection of three new experiments undertaken during 2000-2001 have been finalized and got printed by PDCSR, Modipuram. Also the detailed instruction manual of the "ON FARM" programme has been prepared and sent to P.I. PDCSR for finalization and printing.

- The data of about 435 trials (1999-2000) and 2837 trials (2000-2001) were received. On scrutinizing the data about 10% of the trials were rejected and rest of the trials were statistically analysed. The final tables of the results of the experimental trials (1999-2000) were prepared and sent to the PDCSR for the inclusion in the Annual Report (2000-2001) of the project.

- The salient results of the experiments on response of nutrients; N, P and K on farmer's field conducted at 16 centres during the year 1999-2000 for 10 crop sequences namely, Rice-wheat, Rice-rice, Soyabean-wheat, Maize-wheat etc. in selected zones are given below. The rice-wheat sequence has been tried at Ambikapur (M.P.), Banda (U.P.), Sidharth Nagar (U.P.), Ranchi (Bihar) and Ludhiana (Punjab) with varying fertilizer doses. 100N + 60P + 60 K at Ambikapur, 80N + 40P + 20K at Ranchi for rice crop and 120N + 60P + 40K at Banda and 100N + 50P + 25K at Ranchi centres for wheat crop. For rice crop, response fertilizer ratio to N over control varies from 4.31 (Ranchi) to 14.72 in Sidharth Nagar, response ratio to P (in presence of N) varies from 29.17 (Ludhiana) to 13.97 (Ranchi).

Similar trends of fertilizer response ratio for wheat crop are also obtained. The available organic carbon in soil ranges from 0.44% to 0.82% at various centres whereas soil nutrient N varies from 163kg/ha at (Ludhdiana) to 302 kg/ha (Chindwara) and P varies from 8 to 78 kg/ha.

- Under the component technology based on regional constraints, the experiments conduced on methods of sowing in Rice crop'; the productivity of rice is increased to 20% and 28% by transplanting in line over farmer's practice with fertilizer application of 120N-60P-60K at Sultanpur and Faizabad (U.P.) whereas there is 18% increase in rice yield for 2 seedlings or 4 seedlings/hole over farmer's practice at Igatpuri (Maharashtra).

- The Annual Report of AICRP on Cropping System Research for the year 1999-2000 has been brought out by PDCSR, Modipuram.

- Preparation of Status report (1997-2002) of the project is in progress.

3. Planning, designing and analysis of data relating to experiments conducted under AICRP on Long-Term Fertilizer Experiments

The objective of the project are (i) to plan and design long term fertilizer experiments; (ii) to try alternative approaches for analysis of data and (iii) to Co-ordinate the work relating to statistical aspects of the project and also to provide necessary information to the Project Coordinator (LTFE) and ICAR.

- Appropriate statistical techniques were adopted to examine the effects of years, blocks within years and treatments. Treatment x Year sum of squares were further subdivided into contrasts of interest in interactions with year effects.

- Data of superimposed treatments in bifurcated plots were analysed with nested two-way classified model.

- Regression models were utilized for studying the treatment wise yield and available soil nutrients trends over the years.

- Trend analysis of available soil nutrients at Bangalore and Ranchi centers showed the decline in pH values below their critical levels which affected the crop productivity particularly under 100% NPK and 100% NP treatments thus necessitating the incorporation of lime and FYM as corrective measures. Large build up of phosphorus in soils was also observed under 100% NPK + Hand weeding and 100%NP treatments without enhancing the crop yields and thus showing the futility of application of phosphorus at its optimal level.

- The analysis of superimposed treatments data over the years 1993-2000 at Ludhiana centre revealed no significant reduction in maize or wheat yields either with 50% reduction of phosphorus application over its optimal level or its complete stoppage, alongwith full doses of N and K. The requirement of phosphorus for crops continued to be met through the native source of alluvial soils .

4. A statistical investigation on the long term effects of fertilizers on productivity of cereal crop

sequences

The objectives of the project are (i) to estimate the overall fertilizer treatment effects for each crop sequence; (ii) To study the effect of long-term fertilizer use on the yield of different crops; (iii) to develop methodology for (a) determining economically optimal fertilization practice for each of the crop sequences, and (b) estimation of average annual net returns and variance of net returns for the crop sequences and (iv) to develop yield prediction models for crops included in different sequences.

- The analysis of variance was carried out to decompose the total sum of squares (SS) into SS due to various effects viz. treatment, year, replication, treatment x year, year x replication and treatment x replication interaction under a linear fixed effects model. The expected value of the mean squares indicated that error mean square is an appropriate divisor for testing significance of various effects. Effect of long-term fertilizer use on the yield of crops was studied using regression analysis. An unbiased estimator of the returns over the fertilizer cost (per hectare per annum) for each treatment was obtained under a specific error structure along with its variance and the variance estimator. Yield prediction models have also been developed.

- In addition to identifying the appropriate fertilizer treatment giving highest yield of the sequence at all the four centres namely Akola, Pantnagar, Navsari and Rajendranagar, treatment wise regression models were developed to examine whether the yields exhibited long-term trends over the years or not. Each of the regression models included a polynomial of time trend and appropriate explanatory variables like date of sowing (measured in terms of number of days from the earliest sown date during the study period), amount of rainfall during the crop season, number of fallow days before sowing of the crop and the number of irrigations.

- At Akola centre where sorghum-wheat sequence was tried, no trend was observed in the yield of sorghum crop under the treatment T6 - 50% recommended NPK through fertilizer + 50% through FYM during kharif and 100% recommended NPK through fertilizers during rabi (which was found best in terms of giving highest grain yield for both the crops) while the wheat yield under this treatment showed the highest rate of increase per annum. Moreover high amount of rainfall and delayed sowing had yield depressing effect on both the crops whereas increased number of fallow days adversely affected the sorghum yield and had positive effect on the wheat yield. At Pantnagar, considering the trends in the yields of both the crops, treatment T_{10} (50% recommended N through fertilizer + 50% through green gram straw) seemed to be the most appropriate fertilization practice. At Rajenderanagar, delayed sowing was seen to have adverse effect on the yields of kharif rice whereas it had yield increasing effect in rabi. Rainfall was found to affect the yields of rice in both the seasons. At Navsari centre highest yield of rice and wheat was observed under treatment T_5 (100%

recommended NPK through fertilizers to both the crops). Rainfall had a significant effect on the yield of both the crops and the late sowing affected the yields of both the crops adversely. Number of fallow days before the sowing of crop had an adverse effect on the yield of wheat. The report was finalized and had undergone the process of internal and external refereeing.

5. A Diagnostic Study of Design and Analysis of Field Experiments

The objective of the project are (i) to conduct a diagnostic survey of several experiments for identifying different experimental situations so as to provide appropriate methods of analysis of data for each possible situation as well as to develop methodology for data analysis where appropriate methods of analysis are not available or suitable (ii) to evolve appropriate and modified methods of combined analysis of data from experiments conducted at different locations and/or years by using the concept of nested models; (iii) to use the concept of multivariate analysis of variance to analyze the data of experiments with multiple responses and (iv) to develop an appropriate but exact method of estimation of variance components from an unbalanced data obtained from block designs with possibly unequal block sizes and varying replications

- Data of 2248 experiments retrieved from Agricultural Field Experiments Information System (AFEIS) were analyzed and tested for normality using Kolmogrov - Smirnov and Shapiro - Wilk Tests. The data of 280 experiments were found non-normal (99 from Kolmogrov - Smirnov Test, 88 from Shapiro - Wilk Test and 93 from both).

- Cook's Statistic has been used for detecting outlier(s) in the experimental data. The analysis of covariance procedure has been used to deal with the presence of outlier(s) in the experimental data.

- The experiments with mixtures methodology has been used for the analysis of data pertaining to experiments conducted (i) to study the effect of application of 180 kg of nitrogen per hectare from Urea and Ammonium Sulphate in varying proportions on yield and quality of bidi tobacco conducted at Bidi Tobacco Research Station, Anand and (ii) to study the partial substitution of murate of potash by common salt (NaCl) in rice-rice crop sequence conducted at Karamana under the aegis of AICRP on Cropping Systems Research. Such kind of experiments are also common for the experiments conducted for generating agricultural technologies for the non-polluting agriculture. In these experiments a proportion of the inorganic fertilizers is replaced by the organic manures, green manures, etc. These experiments also satisfy the conditions of experiments with mixtures and can be analyzed as per experiments with mixtures methodology.

- The analytical procedure of the experiments conducted to assess the relative performance of the crop rotations of different duration has been developed using the analytical procedure of general block designs. Using the analytical procedure developed, the analysis of data of Sabour Centre was carried out for

assessing the relative performance of rotations in terms of crop productivity alone. At this centre, the experiment was conducted from 1991 – 1992 to 1993- 1994 with seven crop rotations and 4 replications in a randomized complete block design. The treatment structure was as follows:-

- It can be seen that in the first year there were 3 distinct treatments, with rice-wheat sequence replicated 5 times in each block and the blackgram-wheat and rice-mustard sequences replicated once in each block. In the second year the rotation of the kharif blackgram and rabi mustard was taken in such a way that there were 5 distinct treatments including the residual effect of previous experimentation and at the end of three years all the 7 treatments were distinct.

1991-92	1992-93	1993-94
Rice-Wheat	Rice-Wheat	Rice-Wheat
Rice-Mustard	Rice-Wheat	Rice-Wheat
Rice-Wheat	Rice-Mustard	Rice-Wheat
Rice-Wheat	Rice-Wheat	Rice-Mustard
Blackgram-Wheat	Rice-Wheat	Rice-Wheat
Rice-Wheat	Blackgram-Wheat	Rice-Wheat
Rice-Wheat	Rice-Wheat	Blackgram-Wheat

- The rotations include a number of crops whose productivity cannot be added as such for comparing the performance of different rotations. Therefore, the ANOVA was carried out after converting the grain, straw and grain+straw data in terms of monetary returns, calories and protein contents. The data were analyzed as per procedure of general block designs.

- It is suggested that in such experiments the data on soil parameters be collected and made available to the statisticians for thorough analysis.

- Universally optimal block designs for both the direct effects of treatments applied to Rabi crop and residual effect of the treatments applied to Kharif crop have been obtained for the experimental situations where the experimenter is not interested in the interaction between direct effects and the residual effects of the two sets of treatments. In such experiments, either the treatments do not comprise of complete factorial structure or have at most one replication of the complete factorial structure.

- The estimates of variances of the estimated genotypic variance and error variance from the experimental data generated from incomplete block designs based on ANOVA have been obtained.

6. Planning, designing and analysis of experiments relating to AICRP on STCR.

The objectives of the project are (i) To improve the existing methodology for analysis of on-going STCR experiments; (ii) to carry out planning and designing

for the conduct of new set of experiments and subsequently to carryout the analysis of data and (iii) to develop a database for STCR experiments.

- The data received from different cooperating centres of STCR project, have been analyzed using Response Surface Methodology. The results indicate that in most of the cases the Stationary point is a Saddle point. Therefore, exploration of the Response Surface in the vicinity of the Stationary point was taken up. Regression diagnostics have also been used for detection of outliers.

- While analyzing the data received from different centres it is observed that each experiment should be conducted by choosing a proper set of treatment combinations and should have sufficient number of design points so that a complete response surface could be fitted.

- A status paper on Designing and Analysis of Experiments conducted under AICRP on Soil Test Crop Response Correlations (STCR) was prepared and presented during the National Workshop of AICRP on STCR at BCKV, Kalyani.

- The procedure of selection of suitable design points is under process. Efforts are also being made to incorporate the organic fertilizer levels into the design. A proposal in this regard has been sent to the Project Co-ordinator for his comments/ suggestions.

Information System for Agricultural and Animal Experiments

7. Agricultural Field Experiments Information system .

The objective of the project is to collect the experimental data and other ancillary information in respect of Agricultural Field Experiments conducted at various Agricultural Research Stations in the country and create a database of the collected experiments.

- The regional staff is in position at 8 centers and they have reported the data of about 2278 experiments. The data in respect of 1960 experiments has been edited and got transferred on floppies for further processing while, the information pertaining to 840 experiments was finalized and database updated. The database contains the details of 15,121 experiments. A pamphlet giving salient information about the database has been printed and shall be distributed to various organizations/scientists engaged in agricultural research for popularising the database.

- Database of information system is to be redesigned using latest RDBMS software. Database tables have been designed and front end is being developed using Visual Basic. It is also proposed to develop database for cropping system experiments.

Experimental designs for Agricultural, Animal, Agroforestry and Fisheries Research

8. Designs for Fitting Response surfaces in Agricultural Experiments (Funded through AP Cess fund, ICAR

The objectives of the project are (i) to obtain response surface designs for response optimization and slope estimation when various factors are with

equi-spaced levels and/or have unequal dose ranges for both symmetrical as well as asymmetrical factorials; (ii) to obtain response surface designs for qualitative-cum-quantitative factors; (iii) to study the robustness aspects of response surface designs against non-availability of data on some point(s); (iv) to prepare a catalogue of response surface designs suitable for agricultural experiments and (v) to develop a computer software for the analysis of the designs obtained and catalogued and to illustrate empirically.

- Response surface designs for qualitative-cum-quantitative factors have been obtained.

- The robustness of response surface designs obtainable from balanced incomplete block (BIB) designs has been studied against non-availability of a single observation in terms of information contained in an observation, percent loss in information, increase in the variance of the predicted response, relative A- and D-efficiencies, etc.

- A computer program for the canonical analysis of second order response surface designs using JAVA has been prepared.

- A Response Surface Design (Box-Behnken with 4 center points) for three factors each at three levels in 16 points was recommended for the experiment related to finding the optimum storability conditions of Instant Pigeon Pea Dal conducted at Division of Agricultural Engineering, IARI, New Delhi. The details of the factors and their levels are given as under.

S. No.	Factors	Levels
1.	Soaking Solution Concentration	0.5, 1.0, 1.5%
2.	Cooking Time	8, 10, 12 minutes
3.	Flaking Thickness	0.5, 0.75, 1.0 mm

9. Statistical investigation on the fertilizer use efficiency in relation to cultural practices

The objectives of the project are (i) to carry out the combined analysis of cultural cum manurial trials over years for various crops; (ii) to develop fertilizer response model based on cultural cum manurial trials and (iii) to obtain output-input ratios at various levels of cultural practices for various crops.

- 927 experiments were retrieved from AFEIS and the experiments for which raw data was available were analyzed using appropriate statistical techniques. It was observed that the number of experiments in which main effect due to fertilizer and cultural practice were almost same, interaction effects of cultural practices x fertilizer application were found to be significant in 18-47% of experiments analyzed. 84 cases that were conducted for two or more than two years with same set of treatments at same research station have been identified for combined analysis. Combined analysis of these groups of experiments is in progress. Response surface models were fitted for cultural cum manurial experiments by taking cultural practices as covariate.

10. Three-associate partially balanced incomplete bock designs and their application in partial diallel

crosses

The objectives of the projects are (i) to obtain some methods of construction of three associate class partially balanced incomplete block designs and to prepare a catalogue of the available PBIB(3) designs along with those constructed; (ii) to develop a computer module to catalogue, generate and analyze three associate class partially balanced incomplete block designs and (iii) to identify the efficient plans for partial diallel crosses obtained through three associate class association schemes and to develop computer modules for generation of these plans along with their analysis in complete and / or incomplete block settings.

- Literature on circular designs has been reviewed thoroughly. Circular designs for mn treatments in n blocks of mk plots each and k replications are PBIB designs of (n+1)/2 or (n+2)/2 associate classes according as n is odd or even.

- By redefining two associate class latin-square association scheme, a new three -associate class association scheme with $v = s^2$ treatments arranged in s rows and s columns has been obtained. The parameters of the association scheme are:

  $v = s^2$, $n_1 = 2(s-1)$, $n_2 = s-1$, $n_3 = (s-1)(s-2)$,

$$P_1 = \begin{bmatrix} s-2 & 1 & s-2 \\ 1 & 0 & s-2 \\ s-2 & s-2 & (s-2)\ (s-3) \end{bmatrix}$$

$$P_2 = \begin{bmatrix} 2 & 0 & 2\ (s-2) \\ 0 & s-2 & 0 \\ 2(s-2) & 0 & (s-2)\ (s-3) \end{bmatrix}$$

$$P_3 = \begin{bmatrix} 2 & 2 & 2\ (s-3) \\ 2 & 0 & s-3 \\ 2(s-3) & s-3 & s^2-6s+10 \end{bmatrix}$$

- Two methods were developed for obtaining the designs based on this scheme. The design parameters are as given below:

  (i) $v = s^2 = b$, $r = s-1 = k$, $\lambda_1 = 0$, $\lambda_2 = s-2$, $\lambda_3 = 0$

  (ii) $v = s^2$, $b = 2s^2$, $r = 2(2s-1)$, $k = 2s-1$, $\lambda_1 = s+2$, $\lambda_2 = 2s$, $\lambda_3 = 4$

- Designs based on the new association scheme have been catalogued for number of replications and block size ≤ 20.

- 3-associate class circular designs have been catalogued for block size and number of replications ≤ 20.

- Cubic and circular lattice designs are catalogued for r and $k \leq 20$.

- Software functions have been developed for the generation of first, second and third associates of cubic, extended triangular and rectangular association schemes.

- Computer functions have been developed for the following matrix operations used in constructing PBIB(3) designs: (i) incidence matrix of a design (ii) design layout from the incidence matrix (iii) Kronecker product of two matrices. Functions were also developed for the construction of cubic, extended triangular and rectangular designs in which some of the above mentioned matrix operations are involved.

11. Design and analysis of agroforestry experiments

The objectives of the project are (i) to evolve and document general methodologies for the statistical analysis of data already generated through agroforestry experiments; (ii) to obtain appropriate designs along with the layout plans and methodology for the analysis of the experiments under agroforestry system to be suggested to the collaborative centre(s) and (iii) to study the relationship among the various components (trees and crops) in agroforestry system.

- The experiment on "Evaluation of fodder trees with and without crops under rainfed arable farming for semi-arid conditions is being conducted at IGFRI, Jhansi with 14 treatments in 3 replications consisting of 4 tree species (Siris, Neem, Shisham and Babul) and 2 crops Barley (Fodder) and Gram (Grain) with sole trees and sole crops.

- The data received on dry fodder, green fodder and crude protein of Barley has been analysed as RBD with 4 treatments i.e. Barley with 4 tree species and a control (without tree) and its contrast analysis was performed. It was found that the performance of Barley crop under different tree species is significantly different. In case of crude protein, Barley without tree was also found to be significantly different from Barley with tree.

- The data on growth of tree parameters like Height, Collar Diameter, Crown Diameter and DBH (Diameter at Breast Height) was received and analysed for the 4 tree species Siris, Neem, Shisham and Babul comprising of 12 treatments for the year 2001 and results were sent to collaborative centre at Jhansi. From the analysis it was observed that there are significant differences in the treatments under all parameters (Height, Collar Diameter, Crown Diameter and DBH). Further, it was observed that while comparing Siris tree + Barley crop and Siris tree + Gram crop, Siris tree shows significantly higher performance with Gram crop with regards to Height and Crown Diameter only. The similar trend was found during previous year- 2000. However, when we compare different tree species, there were significant differences between them for all the 4 parameters of the tree.

- Combined analysis for the year 1999-2000 and 2000-2001 of the crops Barley(Green Fodder) and Gram(Grain) was worked out from the data taking the model as replication, tree location, direction, distance and year as factors.

- Under Barley crop, the effect of tree, location and distance were found to be significant for the year 1999-2000, 2000-2001 as well as in the combined analysis. The effect of direction and year was significant only in 2000-2001.

- Under Gram (Grain) crop, tree effect was found to be significant in the year 2000-2001 as well as in combined analysis. The effect of distance to be significant was observed only in year 2000-2001. The effect of year was also found to be significant and its interaction with distance and tree were found to be

significant.

- Monetary value of the system was worked out for the year 1999-2000 and 2000-2001 by taking the value of fodder tree (foliage + fuel), grain and straw of Gram and Green Fodder value of Barley. The system comprising of the Gram crop with Babul and Shisham trees gave return of Rs. 14752/ha and Rs. 14488/ha respectively during the year 1999-2000, while it gave Rs. 18624/ha and Rs. 18324/has with Babul and Siris tree during 2000-2001. It indicates growing of Gram crop with Babul tree is more profitable as compared to growing with other trees (Siris, Neem, and Shisham).

- Establishment, growth and production of multipurpose trees (MPT) and their effect on the growth and production of crop has been conducted at NRCAF, Jhansi in Double split-plot design with 4 replications with three spacings in main plot, 12 tree species in sub-plots and four crop rotations viz. Sorghum-Wheat, Sorghum-Gram, Arhar-Wheat and Arhar-Gram in sub-sub-plots.

- The arrangement of different components in a plot is an important aspect of agroforestry experimentation. The effect of crop geometry was studied in relation to 12 different multipurpose trees for the year 1993-94. In one plot Wheat crop is preceded by Jowar and in another plot by Arhar under each of 12 tree species. The effect of different arrangements of the Wheat on the yield in relation to tree species was investigated using the Incomplete Block Design technique with 4 treatments, treatments being the position of Wheat on 4 plots. From the contrast analysis, it was observed that under the two MPT species namely Ramkanthi and Anjan the effect of treatments was found to be significant on the yield of Wheat crop when compared with one side of the tree with other side.

- The method of path analysis was used to study relationship between the different biometrical characters like plant height, plant population, number of effective tillers, Grain weight per earhead with the yield of wheat crop under different MPT species. It has been concluded that number of effective tillers is the main component of crop that has direct effect on the yield under 7 species (Babul, Mahua, Subabul, Shisham, Siris, Jamun and Aonla).

12. Design and Analysis of on Station and on Farm Agricultural Research Experiments: A Revisit (Funded through AP Cess Fund, ICAR)

The objectives of the project are (i) to develop suitable methodology by using data of uniformity trials and past experiments in deciding the shape and size of irregular plots and blocks for future experimentation and (ii) to develop efficient designs and appropriate methods of analysis of data by exploiting the principle of resolvability, fractional factorials and nested models for experiments on Farm Research.

- The Uniformity trial data on rice (given in Gomez and Gomez, 1984) was classified on the basis of row numbers, column numbers and fertility contour numbers. The data were analyzed using one way classified ANOVA. The CV percent of the three

classifications are 31.285, 31.356 and 17.373% respectively. It gives an indication that the blocks should be formed on the basis of similar contours. Further investigation in this direction is in progress.

- The analytical procedure for on farm experiments conducted with v treatments in b developmental blocks such that there are r_i villages in block i, $i=1,\ldots,b$ has been modified by including the blocks ´ treatment interaction term in the model. This modification helps in inferring whether the treatment effects were consistent across blocks or if there were some specific blocks that seemed to favour one treatment over the other.

- In on farm experiments generally the farmer's practice is to be compared with treatments identified from research stations. The farmer's practice varies from farmer to farmer and it is not certain as to what treatment may be taken as farmer's practice. Method of construction of block designs for such situations using resolvable block designs have been obtained.

13. Statistical study on competition effects among neighbouring units in field experiments. (Funded through AP-Cess Fund, ICAR)

The objectives of the project are (i) to study the characterization properties of the designs for investigating competition effects among neighbouring units; (ii) to obtain (construct) designs for estimating competition effects in one-way and two-way elimination of heterogeneity settings; (iii) to study the optimality aspects of the designs obtained for competition effects and to prepare a catalogue of the optimal (efficient) designs for these situations and (iv) to study the competition effects among neighbouring units using the data generated through simulation techniques.

- Experiments in agriculture, horticulture and forestry often show neighbour effects i.e., the response on a given plot is affected by the treatments on neighbouring plots as well as by the treatment applied to that plot. Interference, often referred to as competition, between neighbouring units is a serious source of bias. Understanding the structure of these competition effects and by properly organising the experimental material, attempts can be made to minimize such bias and also estimate these competition effects.

- Under the block design set-up, three different models are being considered for analysing a design with competition effects. The model with one-sided neighbour effects, model with undifferentiated two-sided neighbour effects, model with differentiated two-sided neighbour effects. Considering the most general set-up of two-sided differentiated neighbour effects i.e. left and right neighbour effects, the information matrix for estimating the direct effects, left and right neighbour effects jointly has been derived. The reduced information matrix for estimating direct effects has been obtained.

DIVISION OF BIOMETRICS

Mandate	Thrust Areas
To develop modelling and simulation techniques for agricultural systems and statistical Investigations in Genetics and Bio-technology.	● Computer simulation studies and applications of re-sampling techniques like bootstrap, Jackknife, balanced repeated replications in Agricultural Statistics ● Studies on gene action, estimation of genetic parameters and genetic merit, genetic progress and other related statistical methods. ● Non-linear statistical modelling of biological, ecological and economic phenomena

Thrust area-wise list of projects in operation is given in Chapter 11. The progress of the projects is given below:

Computer simulation studies and applications of re-sampling techniques like bootstrap, Jackknife, balanced repeated replications in Agricultural Statistics.

1. Development of statistical procedures for selecting genotypes simultaneously for yield and stability

The objectives of the project are (i) to construct new indices for selecting genotypes simultaneously for both yield and stability; (ii) to make comparison among the indices developed, based on standard statistical techniques and on techniques involving simulation and (iii) to develop a computer programme for judging desirable genotypes.

A number of new indices for selecting genotypes simultaneously for yield and stability would be constructed by combining different stability measures and yield indicators. Theoretical basis for determining the weights for yield and stability in these indices would be arrived at. A comparison among the indices so developed will be made so as to judge the superiority of one index over another. This comparison would be based not only on standard statistical techniques but also on techniques involving simulation. In some cases the merit of indices will be judged on the basis of convergence of observed Type 1 error and power of the tests involved. An IBM-PC compatible program for selecting

varieties simultaneously for yield and stability, based on developed indices, will be made. Initially the developed indices will be tested on some cereal crops and depending on the trend obtained the procedures may be extended to other crop situations. For rice crop, the data will be used from All India Coordinated trials conducted by Directorate of Rice Research, Hyderabad. The genotypes included are the promising lines or elite breeding lines which are at different stages of testing in the coordinated project.

Some new indices for selecting genotypes simultaneously for yield and stability have been constructed by combining yield indicators and stability measures. In the proposed combined selection indices, the ratio of the average performance of the ith genotype to the overall mean of all the genotypes under test is taken as the yield component and the ratio of stability information (inverse of the mean squares of year within location) provided by the ith genotype to the mean stability information provided by all genotypes is taken as the stability component. As per the plant breeder's requirement, suitable weights are also given to the components in the indices. The developed indices are tested on multilocation varietal trials of rice crop data. Ranks are given to the varieties based on the yield, stability and index values. High significant correlation is observed between stability and the indices indicating a strong association between them. However, in some data sets significant correlations are also observed between yield and indices (situations where the weights given to the yield components in the index are 60%, 70% and 80%). Based on the index value, when 50% of the top varieties were selected, among them it was found that around 60%-75% are the top yielders and >75% are the stable performers. Necessary computer programs have also been written in SAS and C to deal with the analysis of varietal data. Taking location-year combinations as environments performed the AMMI (Additive Main Effects and Multiplicative Interaction) analysis. The interaction component was decomposed into genotypic score and environmental score. Based on the cumulative proportion explained by the eigen values, the number of PCA axes to be retained are determined. The distance between ith genotypic score (i = 1, 2,..., t genotypes) of all the axes from the origin is taken as the stability measure. In an another proposed index, the ratio of the average performance of the ith genotype to the overall mean performance of all the genotypes under test is taken as the yield component and the ratio of stability information (inverse of the above said distance) provided by the ith genotype to the mean stability information provided by all the genotypes is taken as the stability component. Suitable weight are given to the yield and stability components in the index so as to select genotypes simultaneously for yield and stability. Rank correlations are worked out for the proposed indices with yield and stability. Necessary programs are written to simulate genotype x environment interaction data and the comparison among the indices is in progress.

2. Studies on data processing techniques for statistical analysis of large field variability in hilly and salt affected soil regions

The objectives of the project are (i) to consolidate in a comprehensive manner the data processing techniques for statistical quantification of the large field variability in hilly and salt affected soils; (ii) to finalise the algorithms and

develop softwares for computerised data processing of the natural variability present in the plantations carried out in uncultivable lands (iii) to develop computerised techniques for the construction of the fertility gradient maps of the examined soil characteristic field variability obtained by using different concepts of statistical methodology and (iv) to formulate computerised data processing technology for correlating the plant growth trait performance with that of soil characteristics

The theory of geostatistics, ANOVA for repeated measures and generalised ANOVA in the presence of spatial patterns would be used to examine the field variability in hilly and salt affected soil regions.

The statistical techniques related to variogram analysis and krigging have been consolidated. A tour was undertaken for collecting the data pertaining to relevant experiments to Central Soil and Water Conservation Research and Training Institute, Dehradun. During this visit, the experiment on Aonla - based horti-pastoral systems in degraded lands of Shivalik foothills of North-west India was discussed in detail. This is the experiment for which a part of data was received earlier and analysed. In this data special identification of the observations were made. Another data set pertaining to an experiment conducted to study the effect of supplement irrigation and mulching on growth yield and quality behaviour of Kinno Mandarin was also collected. Statistical modelling of spatial variability in Intercrop Experiments was also taken up. Computer programs for computation and generation of one and two-dimensional variograms have been finalized using JAVA.

Studies on gene action, estimation of genetic parameters and genetic merit, genetic progress and other related statistical methods

3. On some robust estimation of heritability

The objectives of the project are (i) to examine the influence of non-normality and other assumptions on the estimation of heritability; (ii) to study the effect of aberrant values on the estimation of heritability and (iii) to identify and develop procedures for robust estimation of heritability.

The methods of maximum likelihood, ANOVA, REML, MINQUE would be employed to obtain robust estimates of variance components and subsequently the estimates of heritability. These methodologies would be modified to solve the problems of aberrant values and for obtaining robust estimation.

In order to solve the problem of negative estimates of variance components obtained by Henderson's ANOVA in particular and ANOVA methods in general, a simple modification as suggested by Khattree (1998) for insuring the non-negativity of the estimates has been employed and the SAS code and other computing strategies required for this have been examined in detail. The results obtained were also compared empirically with ML, REML and MINQUE methods of estimation of variance components and heritability subsequently. From the results it has been seen that the estimates obtained by this modified procedure is having more bias and has minimum mean square error (MSE). Further the work of development of

procedures for obtaining robust and resistant estimates of variance component for the case of unbalanced data are also to be carried out. The performance of identified procedures has also been examined on various simulated populations.

4. Empirical investigations on the influence of fixed effects on the estimates of heritability

The objectives of the probject are (i) to study the effect of non-genetic factors on the estimation of heritability and its precision; (ii) to compare the different methods of correction of data by applying the method of fitting constants and (iii) to compare mixed model technique with the above methods for estimation of variance components and consequently heritability.

The data was simulated for different values of heritability by half-sib model for single fixed effect. The method of fitting constants by Harvey (1966) was used for correction of fixed effect. The corrected and uncorrected data were analyzed by half-sib analysis.

The data under half-sib for different sample sizes and family structures were simulated from populations with low, moderate and high heritability. Two fixed effects with four levels each were introduced in the data by taking both effects significant and other non-significant. Heritability estimates were obtained from raw data with and without fixed effects and after correction of data for the fixed effects. The estimates of heritability were also obtained in presence of one and two fixed effects by using the mixed model techniques.

5. Studies on growth pattern and heritability of fitness traits in Indian breeds of goats

The objectives of the project are (i) to compare different methods of estimation of heritability of fitness traits and (ii) to compare the adequacy of different non-linear models utilized for studying growth pattern.

Breeding data of goats in respect of fitness traits such as type of birth and stayability at different stages of age of animals was transferred by applying arcsine transformation. These records were used to obtain heritability estimates by Half-sib correlation method for both sexes separately. Heritability estimates for fitness traits were also obtained by Heterogeneity chi-square method.

Growth data for various genetic groups was corrected for fixed effects for season, period and type of birth by using the least square technique. The adjusted records were used to fit the non-linear growth curves like monomolecular, Gompertz and logistic for different genetic groups for each sex separately. Suitability of different non-linear growth models was examined by comparing the R^2 and error mean square values. Based on these three values, the monomolecular model has shown the best fit for different genetic groups and for both sexes followed by Gompertz curve.

Non-linear statistical modelling of biological, ecological and economic phenomena

6. Study of non-linear time series modelling in agriculture

The objectives of the project are (i) to study relative merits and demerits of various tests for testing of linearity; (ii) to

investigate properties of auto-regressive conditional heteroscedastic, self exciting threshold autoregressive and bilinear models from the family of parametric nonlinear time series models and (iii) to develop relevant computer programs for fitting of above models and to apply these to real data from the fields of entomology, fishery, agricultural economics, etc.

Second order index of linearity is to be computed to detect non linearity. The estimated regression function $m_j(n)$ is to be used to identify the possible value of delay parameter in SETAR model. Number of tests both in time domain and frequency domain are to be performed. Efforts would be made to fit the data by AR(p)-ARCH(q) model where the squared error would be autocorrelated. SETAR model will be taken into account for modelling data related to populatilon cycle under food limitation.

Test of linearity in time-series data in terms of "Time Reversibility" has been carried out. Estimation of bispectral density function using the spectral window approach has also been considered. The smoothed estimate of population's second order spectra has been derived by restricting to the class of window generator with characteristic exponent 2. In case of third order estimated spectra, optimal lag window has been used for testing of Gaussianity and linear - non Gaussianity. Time series data has been generated from threshold autoregressive model of order 2 and order of delay parameter of lag 2. Computer program has been written on the basis of 'Search algorithm" and AIC values have been computed. Various 'Foster Lyapunov' or 'drift' criteria for testing of various forms of stability have been studied. NAFED data on onion prices have been analysed. Modelling of trend function (deterministic and stochastic) has been done. In this connection, unit roof test for different trend functions, e.g. alternate hypothesis of zero mean process, constant non zero mean process against the null hypothesis of non stationary data, have been performed. Two step procedure for estimating parameters of SARIMA and ARIMA models have also been carried out. By employing Dickey Fuller test for seasonal time series data, it has been found that the data is seasonally non stationary.

DIVISION OF FORECASTING TECHNIQUES

Mandate	Thrust Areas
To develop models for obtaining pre-harvest forecast of crop production, fish production, milk production poultry products, agrometeorological models for early warning and yield assessment and assessment of losses due to various factors.	Forecasting techniques in Agricultural System.

Thrust area-wise list of projects in operation is given in Chapter 11. The progress of the projects is given below:

Forecasting Techniques in Agricultural System

1. Development of early warning and yield assessment models for rainfed crops based on agrometeorological indices.

The objectives of the project were (i) to prepare agrometeorological indices for early warning and yield assessment of rainfed crops, (ii) to develop models using agrometeorological indices for early warning and yield assessment and (iii) to validate the models and provide early yield assessment.

The project has been completed. The study was conducted for rainfed crops rice – Raipur, sorghum – Parbhani & Delhi and maize – Delhi. Weekly rainfall and pan evaporation data for past 20 to 23 years and corresponding district yield data were utilised. Water Balance technique was used to estimate weekly stress to the crop during its life cycle every year. Appropriate weights were determined for stress at different stages of growth and accumulated weighted stress indices were prepared year-wise for all the three crops at their respective centers. Using these weighted stress indices and time variable (for taking care of trend in yield) as regressors, forecast models were developed . These models provided forecast, six weeks, four weeks and five weeks before harvest for sorghum, maize and rice respectively. Meteorological data for recent years (1997 to1999) were collected and models were validated. Deviations in forecast yield from observed yield ranged between 1% to 11% only in seven out of eleven cases. Results show that the technique requires further refinement for rice crop. Results for maize are satisfactory whereas for sorghum, these are very encouraging .

2. Forecasting the loss in yield due to weeds.

The objectives of the project were : (i) to investigate the intensity and growth pattern of different weeds, (ii) to find out the relationship between crop yield and weed parameters, (iii) to develop methodology for forecasting the loss in yield due to weeds & (iv) to compare the economics of different weed control methods.

The experiments on Soybean and wheat during respective season of kharif and rabi were laid out at the agronomy field of IARI. The observations were recorded on weed counts, dry matter accumulation and leaf area for all the treatments at weekly interval after emergence of weeds. The actual yield of the crop was also recorded at harvest. The part of observations were recorded on weed parameters after emergence of weeds for wheat crop in Rabi season during the second year. Statistical analysis of first and second year data for wheat crop and second year data for soybean crop has been carried out. Data processing for the soyabean crop during the third year is in progress.

3. Forecasting of fish production from ponds.

The objective of the study was to develop appropriate methodology for forecasting fish production from ponds and to determine the optimum time of forecasting.

The project has been completed. In this study two types of models were developed - Multiple regression model & Non-linear models. In Multiple regression model, fish weight at harvest was taken as dependent variable and different co-factors such as pH value, dissolved oxygen etc. measured at particular months were taken as independent variables (depending upon the time of forecasting). Fish weight measured at the particular month was also taken as one the independent variables. The models were fitted through step wise regression. In case of non-linear models, logistic models were fitted for each of the species taking heterogeneous error structure into consideration. Partial data upto 9^{th} month have been used to develop the forecast models. The remaining data were used to validate the models.

The results revealed that in the models developed through stepwise regression, most of the variables were not selected except in some cases where dissolved oxygen and free carbon di-oxide were selected. However fish weights at 7^{th}, 8^{th} and 9^{th} month were highly correlated with the fish weights at harvest. Naturally this variable was selected in every case. Models with this variable were fitted very well. The results of fitting of non-linear models were very promising. There was tremendous improvement under the assumption of heterocedasticity and heteroscedasticity with auto correlation of error variance. Forecast from these models were very good.

4. Pilot study on forecasting of brood-lac yield from Butea monosperma (Palas).

The objectives the project were to identify the factors affecting yield of broodlac and to develop models for forecasting the yield of broodlac from palas tree.

This is an AP Cess fund project of Indian Lac Research Institute, Ranchi in collaboration with IASRI. The data were

collected at 3 sites viz. (i) Lachanpur, Distt. Bilaspur (Chhattisgarh), (ii) - Putidih, Distt. Purulia (W.B.) and (iii) ILRI Farm, Namkum, Distt. Ranchi (Jharkhand). The data included in the study pertained to host tree characters viz. canopy height, canopy diameter; lac insect characters like settlement density of lac insect, density of living female insect population, percentage of male insect, number of predators/ parasitoids, length of settlement per shoot, number of shoots with lac insect , number of petioles per shoot and finally yield of brood-lac. The data were recorded at eight stages of crop growth starting from inoculation to harvest. These data on biometrical characters, brood-lac yield and other insect characters were analysed stagewise. Forecast models were obtained at each stage of crop development and also in combination with the data taken at two or more consecutive stages together. Stepwise regression technique was used for developing the forecast models.

The first year data 1999-2000 have been analysed. The results of Bilaspur district showed that brood-lac input and number of shoots with lac insect culture can explain 70% variation in yield at about 4 months before harvest. In case of Purulia district different characters were found important at different stages. However, the character number of shoots with lac insect culture was found most important factor contributing 92% variation in brood-lac yield. Second year data have been obtained and are being processed.

5. Studies on bioecology and population dynamics of major pests of mango (hoppers, fruitfly, leaf webber and inflorescene midge) and guava (fruit borer).

The objective of the study was to develop forewarning system for outbreak of fruitfly/ mango hopper in mango crop.

The methodology involved imperical verification of the underlying law the "fruitfly follows in natural way of its own" and establishment of relationships between fruitfly population (adjusted for natural cycle) with various relevant lag weather variables by way of fitting appropriate models.

Models were developed by combining various functions fitted between fruitfly population (adjusted for natural cycle) and selected relevant independent lag weather variables. The models using suitable transformations were also fitted and compared with the earlier models. The value of $R^2 = 0.73$ already achieved did not improve. Further, development of models using growth rates etc. are in progress. Modifications in the models are also in progress which are of the form, inclusion of the function representing natural cycle of fruit fly population in the model. Instead of variables with one week lag - period, variables with greater lag - period will be included in the models so that prediction can be made at least two/three weeks in advance.

6. Development of model for forewarning about infestation of the insects of paddy crop.

The objective of the study is to develop model for forewarning about infestation of insects of paddy crop.

Linear regression models and non-linear models were to be developed by having pest count as response variable and weekly lagged variables of weather parameters as regressors for forewarning incidence of pests in paddy crop.

Stepwise regression models were fitted by regressing pest counts of Yellow stem borer and Gundhi bug separately upon weather parameters by taking two weeks lag. Preliminary results were satisfactory. Development of reliable pest incidence forewarning system for paddy crop will be taken up.

7. Epidemiology and forecasting to powdery mildew and anthracnose.

The objective of the study is to develop forewarning techniques for incidence of powdery mildew in mango.

Development of models to understand the non-linear relationship that exists between powdery mildew epidemic and weather parameters in the context of Mango production was taken up.

Development of logistic regression models were done by taking moving averages at different periods of weather parameters and using them as regressors to establish a non-linear relationship with the response variable i.e. epidemic of powdery mildew in mango. On validation, the forewarning system thus obtained by using partial data proved effective with the results obtained comparing well with the corresponding actual year-wise responses of subsequent years not included in model development. A paper entitled, "Statistical modeling for forewarning epidemic outbreak of powdery mildew of mango caused by *Oidium mangiferae Berthet*" by A.K. Misra, Om Prakash and V. Ramasubramanian has been communicated to the Indian Journal of Agricultural Sciences.

The future plan involves development of forewarning system for incidence of Anthracnose in Apple crop. Procurement of relevant data is in progress.

8. Forecasting sugarcane yields using multiple markov chains.

The objectives of the project were - (i) to develop models for forecasting sugarcane yields based on higher order Markov Chains (ii) to develop the feasibility of use of data of more than one point of time through growth indices and principal component analysis (iii) to investigate the usage of lumpable Markov chains in forecast models (iv) to investigate the behaviour of the proposed and also the existing models for forecasting sugarcane yields after increasing the size of the baseline data set through simulation and (v) to forecast the sugarcane yields from the developed models and compare them with those obtained from the existing methods.

Development of improved markov chain models has been done by using lumpable Markov chain concept, preserving the basic dependence structure of Markov chains. Simulating Markov Chain population in order to generate a larger database from the base data was undertaken. Preliminary results were satisfactory. Future plan involves the development of improved Markov chain models using remaining approaches and obtaining forecasts of sugarcane yield and comparing them with those of the existing methods.

9. Development of weather based forewarning system for crop pests and diseases

This is Mission Mode project under

NATP. The lead centre is CRIDA. The objective of the project is to develop weather based forewarning system for important insects pests and diseases for rice, sugarcane, pigeon pea, cotton, mustard and groundnut.

Data for mustard from Dholi, Hissar, S.K. Nagar, Kumarganj, and Behrampur were received for 1999-00 and 2000-01. Data consisted of weekly percent severity of various diseases and corresponding daily / weekly weather parameters for two varieties with different dates of sowing.

Behaviour of severity of various diseases with date of sowing and weather variables were studied. It was found that maximum Percent Disease Severity (max. pds) is highly correlated with week of sowing i.e. as we go for delayed sowing, max. PDS increases. Max. PDS was also highly correlated with weather in initial weeks including weather of pre-sowing week. The interactions of weather parameters were also found to be significant. Models for prediction of max. PDS were developed at various points of time. Using these models, max. PDS can be predicted in initial weeks of crop growth.

Miscellaneous

Database Development

Database on meteorological data collected at various centers under ICAR systems is being developed. Data from 48 centres has been received from 1999 onwards. To maintain these data, a platform was developed in MS-Access. To make this database more friendly a web-page was developed (**http://ob-105/iasri/akjha.htm**) which includes the following items:

(a) List of Institute: In this section, user can view the list of all institute which are sending Meteorological data to IASRI with their Address,Fax,E-Mail etc.

(b) List of Variables: In this section, user can view the list of all Variables(CWS-1 format) of Meteorological data with their details.

(c) Extent of Data: In this section, user can view the duration of data, list of variables for which the data is available and nature of data (Daily/ Weekly/monthly)

(d) Viewing the data : In this section user can view the meteorological data for selected Variables for selected Institute.

DIVISION OF ECONOMETRICS

Mandate	Thrust Areas
To undertake the work relating to models for agricultural planning, non-linear economic models, study of technological change and its diffusion, study of risk and uncertainty in agriculture and agricultural development and poverty alleviation.	● Study of technological change, risk and uncertainty in Agriculture ● Study on Food Security ● Modelling for Agricultural Marketing.

Thrust area-wise list of projects in operation is given in Chapter 11. The progress of the projects is given below:

Study of Technological change, risk and Uncertainty in agriculture

1. An Econometric Study of Technological Dualism in Egg Production

The objectives of the project are (i) to study extent of technological dualism and technological change in egg production, (ii) to study the effect of technological dualism, (iii) to examine technological change on functional income distribution and (iv) to examine allocative efficiency under different levels of technology.

The project is mainly based on primary data obtained from the poultry farms located in the Ludhiana and Mansa districts of Punjab. Poultry is highly developed in Ludhiana district and less developed in the Mansa district. Sixty farms in each district have been taken for detailed investigation. The data collection work is in progress. Data collected earlier is being analysed.

2. Technical Efficiency Analysis of Rice-Wheat System in Punjab

The objective of the project is to estimate farm level efficiency of rice-wheat system in Punjab using stochastic frontier production function.

The rice and wheat production system in agriculture has a vital role to explain the performance of agricultural sector specially when economic studies venture into some important areas like the study of technical efficiency. The theoretical construct of stochastic frontier postulates that the entire production disturbances are captured by a single error term which is composed of two disturbances, one-sided error-term and two-sided error term. The stochastic frontier model accommodates responses of uncontrollable factors of production into two-sided errors while one-sided errors are captured separately by controllable factors of production. The one-sided error term under the

stochastic frontier production function provides the estimates of technical inefficiency. Economists have been constrained with the estimates of mean technical efficiency for longtime as it has been very difficult to decompose error term under stochastic frontier model individually into two components, one representing technical efficiency and the other representing normal errors. With the recent advances in the area of econometrics, it is possible to measure farm specific level of technical efficiency. Econometricians propose the possibility of the large number of distributions associated with the econometric profile of one-sided disturbance in production. Therefore, there is an urgent need to make a proper assessment of the estimates of the technical efficiency provided by some of the theoretical distributions.

Scrutinisation, compilation and file creation for specified variables in respect of farm level cross sectional rice and wheat data of Punjab state is in progress and various distributions viz. half-normal, exponential and Gamma associated with one-sided error term are being studied manually.

Study on Food Security

3. Jai-Vigyan National Science and Technology Project on Household Food and Nutritional Security for Tribal, Backward and Hilly Areas.

The Objectives of the study are i) to document socio-economic conditions and food security status of the targeted population, ii) to assess cost of differential technological interventions in various target domains, iii) to identify possible constraints for diversification and wider adoption of improved life support crop species and allied enterprises, iv) to quantify the potential benefits of improved technologies and diversification on poverty alleviation, food security, income and sustainability of resource base in the target domain, v) to assess implications of improved technology interventions on gender related issues, and vi) to examine role of government intervention through on-going programs for wider adoption and larger impact of improved technologies in tribal, backward and hilly areas.

There are six cooperating centres and IASRI is one of these centres. The work pertaining to phase I of the project dealing with study of existing technology, its adoption and extent of food security in semi-arid zone was completed. Also, work on impact assessment of migratory sheep production programme on food security is being studied in Ajmer (Rajasthan) and Kangra (Himachal Pradesh) districts.

Modelling for Agricultural Marketing

4. Study of Lac Marketing in India.

The objectives of the study are i) To study existing marketing channels and price spread in lac Marketing; ii) to examine extent of market integration in lac Markets and iii) to suggest remedial measures for improving marketing environment of lac in India.

Bivariate price coorelation as developed by Engle and Ganger (1987) would be used to show whether lac markets in India are co-integrated or not. Farm retail price spread are to be examined by using the model developed by Gardner (1975). The price spread is determined by commodity supply, cost of marketing services and retail demand.

The project was started in November 2001. The sampling design was finalised and the sampling units were identified for selection. Performa for the collection of primary survey data were developed for different units such as lac growers, producer and marketing channels under the period under report. The selection of Research Associate for the project would be finalised soon.

DIVISION OF COMPUTER APPLICATIONS

Mandate	Thrust Areas
To develop databases and information systems for agricultural research, conduct post-graduate teaching and *ad hoc* training courses in computer application, provide advisory and consultancy services in electronic data processing and computer services in the Institute	• Development of databases and information system for National Agricultural Research System. • Conduct Post Graduate teaching and ad-hoc training courses in Information Technology

Thrust area-wise list of projects in operation is given in Chapter 11. The progress of the projects is given below:

Development of Databases and Information System for National Agricultural Research System

Program under NATP

1. Institutionalization of Research Priority Setting, Monitoring and Evaluation and Networking of Social Scientists

The objectives of the project are (i) Development of monitoring mechanism; (ii) Development of monitoring indicators at different operative levels; (iii) Development of Project Information and Management System (PIMS) and linking it with Internet (iv) Training and workshops on monitoring and PIMS and (v) Establishing network of agricultural statisticians and economists.

Keeping in view various programmes in the NATP project and guidelines of World Bank, a Mechanism of Monitoring and Concurrent Evaluation (M & CE) in the NATP was developed and discussed at various levels in Sensitization Workshops that were organised in Hyderabad, Dehradun, Bangalore, Lucknow and Modipuram, New Delhi covering PSR, MM and TOE modes of research under NATP, PME Task Force meetings and NATP, PIU. The revised guidelines on M & CE were finalized after incorporating the feedback obtained during these presentations. The same have been printed after seeking approval from the PIU, NATP. The guidelines covered are as follows:

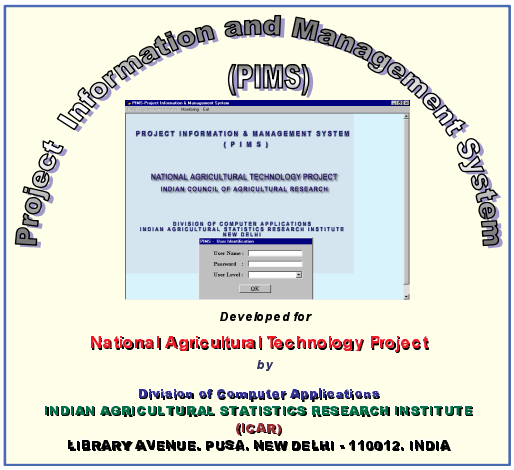
(i) Guidelines for M & CE of Projects under NATP.

(ii) Performa and Guidelines for M & CE of Projects under NATP for PIs and ZCs.

(iii) Performa and Guidelines for M & CE of Projects under NATP for CCPIs.

(iv) Sample Performa for M & CE of Projects under NATP PIs and ZCs.

The development of standalone version of PIMS has been completed after incorporating the module for M & CE. For implementation of PIMS, on-site training workshops were organised at the AES Directorates and PPS offices and also for NATP, PIU. PIMS software package on CD was made available to each center. Solutions for trouble shooting problems were provided at various centres. This package has useful tools for M & CE of NATP projects.



Cover Page of the CD of PIMS

A website for agricultural statisticians was launched at the XIII National Conference of Agricultural Research Statisticians of ICAR Institutes and Agricultural Universities held at Punjab Agricultural University, Ludhiana from November 6-8, 2001. The site is available at the address **http://iasri.delhi.nic.in/ASN/.** The home page of the site is given on next page:

The Development of On-line version of Project Information & Management System (PIMSNET) is in progress.

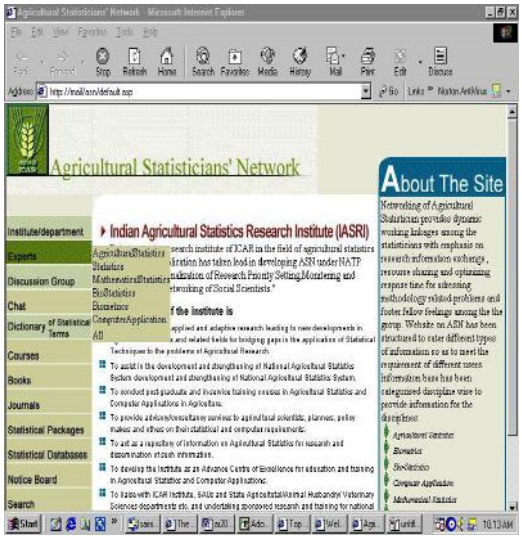
A NATP laboratory has been set up. This laboratory has been connected to the Network at IASRI. The equipment purchased for the activities under this project at IASRI consists of Servers (2), Backup Storage Unit (1), Computers (8), UPS (12), Printers (10), Multimedia Projector (1) and software for web services, backup & data recovery and network security.

2. Integrated National Agricultural Resources Information System (INARIS)

This is a Mission Mode project and related to development of a central data warehouse at IASRI, New Delhi. It is a project of mega nature, with 13 co-operating centers, having multi-disciplinary approach, cutting across several agro-ecosystems and aimed to solve the problem of agricultural resources information of users in NARS with missionary zeal through participatory approach. The main goals of this project are:

1. To integrate existing databases of crops, plant genetic resources, horticultural and plantation crops, spices, animal genetic resources, fish genetic resources, socio-economic resources, agro-forestry system, water resources, agricultural farm mechanization etc.
2. To design and develop comprehensive data base on the above agricultural resources.
3. To develop resource maps based on various databases through GIS, and
4. To develop warehouse of the above databases.

The launching workshop of the project was held on April 12, 2001 at IASRI, New Delhi. The Requirement Analysis Workshops at all the thirteen co-operating centers were organized during the period starting from June 2001 to September 2001. Preliminary analysis document was prepared and presented in each workshop to seek the comments of experts from various related organizations. Representatives from different organization participated in these workshops. The final document of each cooperating center was prepared after incorporating the suggestions of the experts during the workshop. The combined requirement analysis workshop was organized during January 8-9, 2002 at IASRI, New Delhi. All the CCPIs and their representatives participated and made presentation of their respective databases identified in their respective workshops. Suggestions of the experts were incorporated and the final requirement analysis document is ready for printing.



Home Page of the Agricultural Statisticians Network

A detailed coding manual has been prepared which contains coding schemes of all fields required in different databases as planned under this project. This Code Book-1 has been sent for printing. Designing of the databases are complete. Creation of databases and populating these databases are under progress.

Technical specifications for equipments to be purchased for Central Data Warehouse and other database servers at cooperating centers were finalized. Specification for purchase of HW/SW was finalized in all centers and procurement is under process. Training related to application of Software, RDBMS and Networking has been organized and is presently in progress. The training proposal for GIS has also been finalized.

Program under Centre of Advanced Studies in Agricultural Statistics and Computer Applications

3. National Information System on Agricultural Education on Internet (NISAGENET)

Keeping in view the immense potential of Internet in transfer of Information Technology, the NISAGE on INTERNET, that is the web based on-line databases for National Information System on Agricultural Education in India, has been designed and is being developed. The system will be capable of maintaining an up-to- date agricultural education data bank and providing answers to assessment of agricultural education related queries covering all important aspects like characteristics of agricultural universities/institutions, colleges under different universities, teaching programmes offered, infrastructural facilities available in different universities, manpower in agricultural universities like cadre-wise manpower, function - wise manpower distribution,

sex-wise and grade-wise distribution of faculty and R&D information like university research funding, university -wise distribution of projects, technologies developed, SAUs achievements, SAUs publications etc.

NISAGENET has been designed and is being developed in six modules that contain information on:

- Academic Information of the Universities
- Infrastructural facilities available
- Budget Information
- Manpower of the Universities
- Personal Information of the faculty members
- Achievements and highlights (R&D)

The database structure for NISAGENET has been designed. The module on Infrastructural Facilities has been developed and is under testing stage. The designing and development for the front-end modules for Academic, Budget and Manpower related information and other modules is in progress.

Inter-Institutional Projects

4. NATP project under the CGP mode of research "Development of Expert System of Extension"

Lead Institute: Indian Agricultural Research Institute (IARI)., Pusa, New Delhi-110012

Available expert systems/expert system literature was studied and requirement analysis of the proposed system has been performed. A number of available technologies were evaluated against the project requirements. The proposed exist system would be a web-based system. The n-tier architecture has been designed for the system. The system would be browser based user interaction layer; the application logic would be embedded in second layer, which would interact with the inference engine layer. The inference engine layer processed the rules that are stored in the underlying database layer. The inference engine would be implemented using the Java Expert System Shell (JESS). Under the project an R&D license has been acquired for JESS developed by Sandia Laboratories, US. The establishing of the linkages among organizations for building the knowledge base has been started. Under this process the NRC Rapeseed Mustard, Bharatpur and IISS Bhopal have been visited. The PDCSR, Modipuram CCS HAU, and IIHR Bangalore have been contacted for getting the information for knowledge acquisition model. Also, with the help of CIMMYT, India some methodologies in Rice-Wheat System and Rice IPM CD from IRRI, Philippines have been acquired. The development of web based knowledge acquisition is in progress. A project workshop was organized on 26th and 27th March 2002 at the lead center. Workshop was attended by the agriculture experts working on the selected crops. Project team and experts decided the format of the knowledge acquisition for each crop. A database has also been designed according to the desired format. A technical manual of JESS has been developed for the project team members.

5. Network of Social Scientists

Lead Institute: National Centre for Agricultural Economics and Policy Research (NCAP), New Delhi

Web site has been successfully implemented on the domain of NIC and site is accessible at the address **http://agrieconet.nic.in** . The site is being updated.

Institute project

6. Development of software for Online Information on Personnel Management in ICAR System

The objectives of the project are (i) to design and develop database required for the manpower of ICAR setup; (ii) to design and develop user interface for online data entry and updating and (iii) to design and develop reports and queries for manpower information management.

The literature for personnel management and human resources in ICAR set up was collected and reviewed. Considering the day-to-day requirements on personnel management, complete requirement analysis was done. The designing of the database was completed. Input forms were developed and validated. A sample data was collected through the designed performa as guided by the Secretary ICAR and Director (DARE) and queries were developed on important issues. Final reports on the Institute wise information have been developed and a Demo was given to team of officers under the Chairmanship of Secretary, ICAR.

Revolving Fund Scheme

7. Short Term Training Programs in Information Technology

The objectives of the project are (i) to train manpower in the field of Information Technology and (ii) to expose the scientists of NARS to latest development in Information Technology

Twenty-three training programmes of 34 weeks duration were conducted during the period for the scientists/ staff of ICAR institutes and State Agricultural Universities, the details of which are given below:

S. No.	Topic	Period	No. of participants
1.	Web Programming & Internet Technologies	16-4-2001 to 28-4-2001	11
2.	SPSS	30-4-2001 to 9-5-2001	6
3.	Oracle - Application Development	14-5-2001 to 26-5-2001	4
4.	Java Programming and Internet Technologies	28-5-2001 to 9-6-2001	7
5.	MS-Office -I	11-6-2001to 16-6-2001	14
6.	MS-Office-II	18-6-2001 to 23-6-2001	17
7.	MS-Office -I	25-6-2001 to 7-7-2001	7
8.	Visual Basic Programming	16-7-2001 to 28-7-2001	10
9.	MS–Office -I	30-7-2001 to 4-8-2001	6
10.	RDBMS	13-8-2001 to 18-8-2001	6

S. No.	Topic	Period	No. of participants
11.	Web Programming & Internet Technologies	20-8-2001 to 1-9-2001	7
12.	MS-Office-I	10-9-2001 to 15-9-2001	10
13.	SPSS	24-9-2001 to 29-9-2001	3
14.	Web Designing	15-10-2001 to 20-10-2001	5
15.	Java Programming	29-10-2001 to 9-11-2001	4
16.	RDBMS	19-11-2001 to 24-11-2001	2
17.	MS-Office–I	10-12-2001 to 15-12-2001	4
18.	MS - Office-II	17-12-2001 to 22-12-2001	4
19.	Web Designing	7-1-2002 to 11-1-2002	4
20.	C++ Programming	21-1-2002 to 2-2-2002	2
21.	RDBMS	11-2-2002 to 16-2-2002	6
22.	MS-Office-I & II	18-2-2002 to 2-3-2002	6
23.	MS-Office-I & II	11-3-2002 to 23-3-2002	2

Advisory and consultancy services in data processing

Six M.Sc./Ph.D./research workers were provided help in data processing and interpretation of results as per details given below :

1. Sh. Vikas Abrol, Choudhary Chotu Ram PG College, Muzaffarnagar, U.P.
2. Dr. Bakshi Ram, Regional Centre, Sugarcane Breeding Institute, Karnal.
3. Sh. Salej Sood, H.P.K.V.V., Palampur
4. Sh. K.K. Gupta, CCSU, Meerut
5. Sh. Manoj Kool Nazir, SKUAST, Jammu
6. Sh. Ramesh Kumar Jha, FRI. Dehradun

Computer services

(a) Selective Dissemination of Information

Bio-informatics Centre provided services to Scientists in the NARS in terms searching from the bibliographic databases and to the scientists of the Institute for colour output of certificates, cover pages and laser out puts for various documents. It received 6 requests from other institutes of ICAR and output of 11,790 abstracts were provided to them

(b) Data Entry

Personal Computers in the division were used to prepare data records on floppies as under:

Conducting Post Graduate Teaching and Ad-hoc Training Courses in Information Technology

Total jobs	107
Total records created	152839

(a) Teaching and Guidance in the PG Programme in Computer Application

The courses for the 3rd Trimester for

the year 2000-01 and 1st and 2nd Trimester for the year 2001-02 for M.Sc.(Computer Applications) were offered. These were attended by students of M.Sc.(CA) and Ph.D./M.Sc. students of PG School IARI. Six students completed their M.Sc. programme in Computer Application and five new students joined this course during 2001-02.

(b) Ad-hoc Training Programmes

The division organised one training programme under Centre of Advanced Studies and 23 training programs under the Revolving Fund Scheme.

(c) RFS Laboratory

A Multimedia lab has been established with 18 Pentium IV PC's, a Scanner, Two Dot Matrix Printers and a (Toshiba –2860) Photocopier.

Information system developed

- Project Information and Management System (PIMS) for NATP.
- Expert Management Information System (EMIS) for the ASRB.

Other important activities

- Preparation of two documents for the development ARFISNET, a Web based Financial Management System for the ICAR
  (a) Requirement Analysis document
  (b) Terms of Reference document for hiring consultant to develop ARFISNET.
- Assistance provided in the conduct of All India Combined Examination for ICAR's UG Degree programme of IARI, IVRI, NDRI, CIFE; CAU and SAUs for the Academic Session 2001-2002
- Regular modification and updation of IASRI website.
- Support is also being provided for operation and maintenance of computer and related equipment in the Institute.
- Guidance and help were provided to agricultural workers from various SAUs and ICAR institutes in the analysis of data and interpretation of results.

Special Assignments:

- Hindi Version of the IASRI Website was prepared with the help of Hindi Unit and launched on 14th September 2001.

Activities relating to resource generation

A total amount of Rs. 57,618=00 has been generated through analysing data on computers and sale of SPAR1 package and development of information system.

LIBRARY

CHAPTER -4

LIBRARY AND DOCUMENTATION

Library of the Institute plays an important role in serving the information needs of its users. It is being continuously used by scientists, staff and students of the Institute. It provided Library Documentation and Information services to the scientists, staff, students and researchers as well as users from ICAR Institutes and other State Agricultural Universities.

The Library Advisory Committee plays an advisory role in the management of the Library and clears all proposals relating to enrichment of resources of the library such as books, journals, as well as infrastructural development, etc. The Library Advisory Committee for the year 2001-2002 has been as under.

1.	Dr. S.D. Sharma	Chairman
2.	Dr. A.K. Srivastava	Member
3.	Dr. V.K. Gupta	Member
4.	Dr. P.K. Malhotra	Member
5.	Dr. Prajneshu	Member
6.	Dr. H.V.L. Bathla	Member
7.	Dr. R.K. Pandey	Member
8.	Dr. Ranjana Agarwal	Member
9.	Dr. V.K. Sharma	Member
10.	Dr. D.K. Agarwal	Member
11.	Dr. P.S. Rana	BOS Member
12.	Dr. Tauqueer Ahmad	BOS Member
13.	Shri B.M.K. Raju	Student-Representative
14.	Shri Chironji Lal	Member
15.	Shri H.K. Samadar	Member
16.	Dr. S.S. Srivastava	Member-

The Library provided following services to its users.

1. Reprographic Services
2. Current Content Service
3. CD searches
4. Bibliographic Services
5. Inter Library Loan service for resource sharing
6. Current Awareness Service

During the year under report as per PMC direction NATP assigned IASRI to take up "Strengthening of Library Information System" project for NARS. Consequently the Library prepared detailed project proposals after conducting survey within ICAR/SAUs Libraries for assessing Current Status. The project entitled "Strengthening of Library Information System" was presented before World Bank Team.

Director, IASRI is the Chief Coordinator and Head (Library), IASRI is the Coordinator for monitoring this project.

In this connection, the Library of the Institute organised first time a Workshop on "Library Interconnectivity within ICAR/SAU's Libraries" during 30-31 Jan.,2002

BRIEF STATISTICS

S. No.	Item	N0.
1.	No. of books added .	191
2.	No. of Hindi books added.	112
3.	No. of Grey Information material added	88
4.	Current Stock of Books	24493
5.	No. of Indian and Foreign Periodicals subscribed	110
6.	Current Stock of Bound Periodicals	7093
7.	Current Stock of Complimentary Publications	8000
8.	No. of Publications issued from the Library	13,288
9.	No. of publications borrowed or lent out on Inter Library Loan	55
10.	No. of readers visited and consulted the library	11,578
11.	No. of pages of scientific and technical nature reprographed	18429

CHAPTER -5

TECHNOLOGY ASSESSED AND TRANSFERRED

- Provided comments/ suggestions on the project entitled 'Modeling of Environmental Contributions of India's Livestock submitted in IASRI, New Delhi by Dr. S.N. Mishra, Chairman, Society for Economic and Social Research, Delhi. The aforesaid Live stock's environmental contribution oriented study seems to be enthusiastic and revolutionary one but it should be supported and demonstrated by the realistic data collection on all the relevant aspects being tackled under the study.

- A linear programming approach has been developed for estimating/ projecting the energy requirement in agricultural sector. The approach uses the maximization of yield subject to the constraints on the availability of energy from different sources like Human Labour, Animal Labour, Diesel, Electricity, Seed Rate, Farmyard Manure (FYM), Fertilizer, Chemicals, Machinery, Total Energy, etc. The procedure has also been used for minimization of total energy for obtaining a given level of yield. The concept of energy use efficiency has also been introduced. This technique is being exploited by the All India Co-ordinated Research Project on Energy Requirement in Agricultural Sector, Central Institute of Agricultural Engineering, Bhopal.

TRAINING

CHAPTER -6

EDUCATION AND TRAINING

DEGREE COURSES

The Institute continued to conduct the following degree courses in collaboration with the Post Graduate School of Indian Agricultural Research Institute (IARI) which has the status of a Deemed University:

i) Ph.D. (Agricultural Statistics)
ii) M.Sc. (Agricultural Statistics)
iii) M.Sc. (Computer Application)

Both Ph.D. and M.Sc. students are required to do courses not only in Mathematics and Agricultural Statistics but also in Agricultural Sciences like Genetics, Agronomy, Agricultural Economics, etc. The Courses in Mathematics, Agricultural Statistics and Computer Application, etc. are offered at this Institute while the courses in Agricultural Sciences are offered at the IARI.

The eligibility qualification for admission to Master's degree in Agricultural Statistics is a Bachelor's degree in Agriculture / Horticulture / Forestry / Agroforestry / Sericulture / Agricultural Marketing/ B.Sc.(10+2+3 System) . For admission to Master's degree in Computer Application, the eligibility qualification is a Bachelor's degree in Agriculture / Computer Science / Agricultural Engineering / B.Sc. (Horticulture), Veterinary Science, Home Science, B.Sc. (Forestry)/ B.Sc. with Maths/Statistics/ Physics/B.Sc. (10+2+3 System)

Further for admission to Doctor's degree in Agricultural Statistics the eligibility qualification is a Master's degree in Agricultural Statistics/ Statistics/ Mathematical Statistics / Bio-Statistics of IVRI / Professional Statisticians' Certificate Course (PSCC) from IASRI.

Number of students admitted / Completed various courses during 2001-02 is as follows:

(a) Ph.D. (Agricultural Statistics)

Five students were admitted and two students completed the Ph.D. (Agricultural Statistics).

(b) M.Sc. (Agricultural Statistics):

Five students were admitted and two students completed the M.Sc. (Agricultural Statistics).

(c) M.Sc. (Computer Application):

Five students were admitted and six students completed the M.Sc (Computer Application)

NATIONAL TRAINING PROGRAMME

Senior Certificate Course in Agricultural Statistics and Computing

The Senior Certificate Course in Agricultural Statistics and Computing was organised for the benefit of research workers engaged in handling statistical data collection, processing, interpretation and employed in research Institute of the Council, State Agricultural Universities and State Government Departments etc. The main objective of the course was to train the participants in the use of latest statistical techniques as well as use of computers and software packages.

The course has been modified from this year and organised during the period July 09, 2001 to Dec. 29, 2001. The Course comprises of two independent modules of three months duration each. Three participants have attended the module-I only and six participants including one departmental have attended both the modules and were awarded the course certificate after successfully completing the same. The course covered under both the modules included Statistical Methods and Official Agricultural Statistics, Use of Computers in Agricultural Research, Sampling Techniques, Econometrics and Forecasting Techniques, Design of Experiments and Statistical Genetics. The course concluded with a Valedictory function on Dec 29, 2001 in which Dr.S.D. Sharma, Director, IASRI distributed the certificates to the successful participants.

TRAINING PROGRAMME UNDER REVOLVING FUND SCHEME

Twenty-three training programmes were organised under this scheme. Details are given in the progress report of the Division of Computer Applications.

TRAINING PROGRAMMES UNDER CENTRE OF ADVANCED STUDIES (CAS)

Following two training programmes were organised under CAS. The details are as follows:

Training Programme on 'Biometrical Methods for Agricultural Research'

A training programme on Biometrical methods for agricultural research was organized during November 22 to December 12, 2001 at the Institute, keeping in view the importance of interaction among research statisticians, scientists and faculty of other disciplines in various ICAR Institutes and State Agricultural Universities. The programme, besides providing opportunities for exchange of views, discussion of current problems and fostering fellow feeling amongst the participants and speakers, also dwelt upon some recent advances in Biometrics and other statistical and computing tools useful in analysis of data in agriculture. The course has been structured in a series of modules. The module on 'Biometrical methods' deliberated on role of statistics and computers in agricultural research, regression diagnostics, discriminant analysis, non-parametric analysis, logistic regression, analysis of malnutrition data, multivariate analysis and intellectual property rights in agriculture. The module on 'Analysis of data on computer' discussed statistical packages useful for analysis of breeding data. The packages included SPAR1, SPSS, SAS, BLUP, etc. The module also discussed computer intensive methods and simulation for genetic models. The third module 'Statistical methods in

animal and plant breeding research' covered extensively, estimation of variance components, genetic basis of selection, gene action, selection strategies, genetic and environment interactions, estimation of genetic parameters, mating and environmental designs. This module also included biotechnological concepts, like statistical and computational tools in molecular breeding, molecular markers, terminator seeds and their implications, DNA finger printing in plant identification techniques. In the module on 'Modelling biological phenomena' linear and nonlinear models, time series models, crop simulation models, compartment models and projection matrices, and applications of these models in agricultural research have been included. In addition to above, a special lecture on 'Genetically altered crops' was also arranged. The faculty for this programme was drawn from teachers and scientists from IASRI and different Institutes/Universities. Twenty participants joined the programme. Out of these, twelve participants were from State Agricultural Universities and eight from ICAR Institutes. Discipline-wise there were nine from statistics, six from plant breeding, two from animal breeding and one each from horticulture, genetics and agricultural engineering disciplines.

Training Programme on Designing Vortals for NARS

A twenty-one days training programme on 'Designing Vortals for NARS' during 6th to 26th February 2002 under the aegis of Centre for Advance Studies in Agricultural Statistics and Computer Applications was organised at the Institute. Director, IASRI inaugurated the training programme and distributed the training certificates to twenty participants from State Agricultural Universities and ICAR institutions at the valedictory function of the training program. This training program was planned in such a way that the participants are exposed to the latest knowledge and techniques in the field of computers and information technology. The topics covered under the program were Designing and Structuring of Vortals, Concepts of Web Designing, Relational Databases, MS Access for keeping databases on SQL Server and VB Script and ASP for dynamic Web Page Development. A reference manual was prepared from the handouts intended for the participants, which would serve not only as a teaching aid but also as a constant reference guide for the benefit of the participants

Summer School/Short Programme

A summer school on "Quantitative Techniques in Production Economics Research" was organised during May 15 to June 04, 2001 for twenty-five teachers/ research workers. The detail is given in Chapter 16.

Training Programme on "Sample Surveys Related to the Estimation of Area and Production of Fruits and Vegetables"

The Institute organized a training programme on "Sample Surveys related to the estimation of area and production of fruits and vegetables" during August 22-25, 2001. It was sponsored by the Department of Horticulture, Govt. of Haryana for four officials of their department. The Course Introductory Session was held on August 22, 2001 while the valedictory function of the training programme was organised on August 25, 2001. The core faculty for this course was mainly from the Division of Sample Survey. Dr. S. D. Sharma,

Director, Dr. A.K. Srivastava, Joint Director and Dr. H.V.L. Bathla, Head of Sample Survey Division also gave lectures in this training programme. Dr. V.K. Srivastava, Additional Statistical Advisor, Directorate of Economics and Statistics, Ministry of Agriculture, Govt. of India was involved to deliver a lecture on Fruits & Vegetables Surveys in different States. During the training programme, the participants were exposed to role of computers in survey data analysis, methodological issues relating to horticulture crops, various aspects of sample surveys with special reference to planning and organization, methods of sample selection and determination of sample size, stratified sampling, cluster and multistage sampling, schedules for data collection of fruits and vegetables surveys, estimation of extent of cultivation of fruits & vegetable surveys. There were practical sessions on estimation of production of fruits and vegetables at State and district levels. The participants were also taken to Ladpur village in Delhi state for field demonstration of procedure relating to crop cutting on the brinjal crop. The main thrust of this programme was estimation of area, production & productivity of fruits & vegetables.

International Training Programme on Development of Crop Statistics Methodology

A study tour/training programme on "Development of Crop Statistics Methodology" sponsored by Food and Agriculture organisation, for 2 participants from Govt. of Eritrea, was organised at the Institute during April 13-27, 2001. One of the participants is working as Statistician and the other one as Horticulturist in the Ministry of Agriculture, Govt. of Eritrea. Dr HVL Bathla, Principal Scientist & Head, Sample Survey Division was the Course Director and Dr KK Tyagi, Principal Scientist was the Associate Course Director for the study tour / training programme. Eritrea at the moment does not have proper system of land records or crop statistics. Keeping in view the requirements, the whole study tour / training programme was so designed so as to help the participants in developing crop statistical methodology in their country. It included lectures on applied aspects, field visits and demonstrations, etc. The main emphasis was to acquaint them with the agricultural statistical system of India. In view of this, the participants were explained about functionaries at village/block/tehsil/district level, khasra registers, maintenance of land records etc. The faculty for the course was drawn from the Institute as well as from National Sample Survey Organisation, Central Statistical Organisation, Directorate of Economics & Statistics, Registrar General Office, etc. The NSSO Officers also assisted in arranging field visits for the participants. The training programme was started with Interaction Meet with the Director. The lectures delivered to the participants were on different topics viz. concept of sampling, simple random sampling, sampling with varying probabilities, use of stratified sampling, cluster sampling, systematic sampling, double sampling, planning and organisation of sample surveys, improvement of crop statistics scheme, girdawari operations, sample check on crop cutting experiments, preparation of data schedules, tabulation programmes, preparation of estimation of yield rates, statistical system in India, methodological issues related to crop surveys & fruits and vegetable surveys, crop forecasting techniques, overview of softwares available in the analysis of data, use of auxiliary information, general crop estimation surveys, operational aspects, agency for conduct of general crop estimation surveys, estimation

procedures in sample surveys with specific reference to Eritrea, integrated sample surveys, remote sensing and its application in agriculture and methodological issues related to livestock product surveys. In these lectures, the main emphasis was on applied aspects. As part of the study tour, the participants were taken to NSSO (FOD) office located at Faridabad, Gwalior and Agra, where they were explained about different aspects relating to sample surveys conducted by NSSO. They were also taken to the field for demonstration of crop cutting experiments on wheat crop. The participants were taken to the office of the Commissioner of land records, Gwalior (M.P.) to get them acquainted with the land records system etc. On April 27, 2001, the Valedictory Function of the training programme was organised during which the Director distributed the Certificates.

Workshop on Economic Accounts for Agriculture

A Workshop on "Economic Accounts for Agriculture" jointly conducted by the Food and Agriculture Organization (FAO) of the United Nations and the United Nations Statistical Institute for Asia and the Pacific (SIAP) was organised at IASRI, New Delhi during Dec. 10-15, 2001. The detail is given in the Chapter 16.

TRAINING PROGRAMME FOR VISITORS

- Two Indonesian experts sponsored by Directorate of wheat research, Karnal visited on 19.05.2001.
- Thirty students of M.Stat from Indian Statistical Institute , Calcutta sponsored by Central Statistical Organisation, New Delhi visited on 11.06.2001.
- Twenty-three probationers of XXV Batch of Indian Statistical Service sponsored by Central Statistical Organisation, New Delhi visited on 05.12.2001.
- Twenty M.Sc.(Stat) students of Department of Statistics, Panjab University, Chandigarh visited on 21.02.2002.

RESEARCH FELLOWSHIPS

During 2001-02, sixteen Ph.D and twenty-one M.Sc. students received research fellowship. Fifteen Ph.D. students received IARI Scholarship at the rate of Rs.4400/- p.m. in addition to Rs.10,000/- per annum as contingent grant and one Ph.D. student received ICAR Senior Research Fellowship at the rate of Rs.5600/- p.m. besides Rs.10,000/- per annum as contingent grant. Nine M.Sc. students received ICAR Junior Research Fellowship at the rate of Rs.3600/- p.m. besides Rs.6000/- per annum as contingent grant and twelve M.Sc. students received IARI Scholarship at the rate of Rs.3200/- p.m. besides Rs.6000/- per annum as contingent grant.

FACULTY MEMBERS OF P.G. SCHOOL, IARI IN AGRICULTURAL STATISTICS

1. Dr.A.K. Srivastava, Joint Director & HD (Eco)/HD(Bio)
2. Dr.V.K. Sharma, Professor (Agricultural Statistics)
3. Dr. Prajneshu, Principal Scientist
4. Dr.H.V.L. Bathla, Principal Scientist & HD (SS)
5. Dr. Randhir Singh, Principal Scientist
6. Dr. Ranjana Agarwal, Principal Scientist & HD (FT)
7. Dr. V.T. Prabhakaran, Principal Scientist
8. Dr. V.K. Gupta, Principal Scientist & H.D.(DE)
9. Dr. V.K. Bhatia, Principal Scientist
10. Dr. B.C. Saxena, Principal Scientist
11. Dr. D.P. Handa, Principal Scientist
12. Mrs.Asha Saxena, Principal Scientist
13. Dr.D.L.Ahuja, Principal Scientist
14. Dr.U.C.Sud, Principal Scientist
15. Dr.Chandrahas, Principal Scientist
16. Sh.S.D.Wahi, Principal Scientist
17. Dr.K.K.Tyagi, Principal Scientist
18. Dr.P.K.Batra, Principal Scientist
19. Dr.P.S.Rana, Principal Scientist
20. Dr.Amrit Kumar Vasisht, Principal Scientist (working at IARI)
21. Dr.R.Srivastava, Principal Scientist
22. Dr.Jagbir Singh, Senior Scientist
23. Dr.M.S.Narang, Senior Scientist
24. Dr.Aloke Lahiri, Senior Scientist
25. Dr.Anil Rai, Senior Scientist
26. Dr.Rajender Parsad,Senior Scientist
27. Dr.Seema Jaggi, Scientist (Sr. Scale)
28. Dr. Lal Mohan Bhar Scientist (Sr. Scale)
29. Dr. Amrit Kumar Paul, Scientist
30. Dr. Tauqueer Ahmed, Scientist
31. Dr. A.R.Rao, Scientist
32. Dr.Ramasubramanian V., Scientist
33. Dr.Girish Kumar Jha, Scientist
34. Dr.Cini Varghese, Scientist

FACULTY MEMBER OF P.G. SCHOOL, IARI IN AGRICULTURAL ECONOMICS

Dr.R.K.Pandey, Principal Scientist

FACULTY MEMBERS OF P.G. SCHOOL, IARI IN COMPUTER APPLICATION

1. Prof. S.D.Sharma, Director
2. Dr.P.K.Malhotra, H.D.& Professor (Computer Application)
3. Dr.R.C.Goyal, Prinicipal Scientist
4. Dr.I.C.Sethi,Prinicipal Scientist
5. Dr.V.K.Mahajan, Prinicipal Scientist
6. Dr.D.K.Agarwal, Prinicipal Scientist
7. Dr.R.K.Jain, Senior Scientist
8. Sh Harnam Singh Sikarwar, Scientist (S.G.)
9. Sh.M.S.Farooqui,Scientist
10. Ms.Shashi Dahiya,Scientist
11. Ms. Alka Arora,Scientst

AWARDS

CHAPTER -7

AWARDS AND RECOGNITIONS

AWARDS

- Dr. V.K. Bhatia - Selected for Prof. D.N. Lal Memorial Lecture Award.

- Dr. Jagbir Singh received a Cheque of Rs. 1000/- as honorarium for scholarly work from the Deptt. of Ag. & Coop., Min. of Agriculture, Govt. of India on account of the publication of the research paper entitled "Estimation of Foodgrain Losses and Seasonal Fluctuation" by Jagbir Singh and H.V.L. Bathla in Agriculture Situation in India, Jan. 2001, Vol. LVII, No. 10, 551-554.

- Dr. Rajender Parsad received Young Scientist Award for Social Sciences from National Academy of Agricultural Sciences for the Biennium 1999-2000. The award consists of a citation, a medal and a cheque of Rs. 25,000/- and was presented in the inaugural session of the 5th Agricultural Science Congress held at Assam Agricultural University, Guwahati during April 4-7, 2001.

- Dr. Rajender Parsad received APPRECIATION LETTER from Dean, P.G. School, I.A.R.I. for Excellent Teacher in the discipline of Agricultural Statistics for the 3rd consecutive year.

- Dr. Seema Jaggi Received Lal Bahadur Shastri Young Scientist Award of ICAR for the biennium 1999-2000. The award consists of an amount of Rs. 25,000/- and an Adhoc Scheme entitled "Statistical study on competition effects among neighbouring units in field experiments" funded by AP Cess Fund of ICAR.

- The paper entitled Minimal balanced repeated measurements designs by Seema Jaggi, VK Sharma and Cini Varghese received the Best Poster Presentation Award during 89th Indian Science Congress held from January 3-7, 2002 at University of Lucknow, Lucknow.

- Dr. Seema Jaggi received APPRECIATION LETTER from Dean, P.G. School, I.A.R.I. for Excellent Teacher, 2001 in the discipline of Agricultural Statistics

- Sh. H. Ghosh - Received the "ISAS Young Scientist Award 2001" at the 55th Annual Conference of the Indian Society of Agricultural Statistics held at C.I.A.E. Bhopal from 15 - 17 January, 2002.

- Sh. K.C. Gupta has been identified as an excellent teacher in the discipline of Computer Application for the year 2001 by the Dean, P.G. School, IARI, New Delhi.

- Dr. A.K. Paul - Received first prize of Rs 600/- in Hindi Pragya Training programme.

- Dr. Ramasubramanian, V. : Received cash awards for successfully completing Hindi (Praveen & Pragya) examinations conducted by Hindi Teaching scheme, Department of Official Language, Home Ministry, New Delhi during Jan.-Nov., 2001.

- Dr. Sushila Kaul received "Women of the Year 2001" award from the American Biographical Institute.

- Ms. Sonali Das stood joint first and Ms. Anshu Dixit stood second in the declamation contest held on celebration of annual day function of the institute on July 2, 2001 for the topic 'Women's Empowerment and National Development'.

RECOGNITION

Affiliation with Professional Societies/ Institutions

Indian Society of Agricultural Statistics, New Delhi

Prof SD Sharma
Dr AK Srivastava
Dr VK Gupta
Dr PK Malhotra
Dr HVL Bathla
Dr (Smt.) Ranjana Agrawal
Dr RK Pandey
Dr Prajneshu
Dr Randhir Singh
Dr VK Sharma
Dr VT Prabhakaran
Dr VK Bhatia
Dr KK Tyagi
Dr DL Ahuja
Dr Chandrahas
Dr VK Mahajan
Dr R Srivastava
Dr PK Batra
Dr DP Handa
Dr Jagbir Singh
Sh JP Goyal
Sh RS Khatri
Dr UC Sud
Dr Aloke Lahiri
Dr SP Bhardwaj
Dr MS Narang
Sh Lal Chand
Sh SD Wahi
Sh AS Gupta
Sh JK Kapoor
Sh DC Mathur
Sh Balbir Singh
Sh SC Mehta
Sh Madan Mohan
Sh SC Sethi
Sh Satya Pal
Smt Rajinder Kaur
Smt Ajit Kaur Bhatia
Sh GL Khurana
Sh VK Jain
Sh NK Sharma
Sh KK Kher
Sh RM Sood
Dr Rajender Parsad
Sh VH Gupta
Dr Seema Jaggi
Dr LM Bhar
Dr AK Paul
Dr AR Rao
Sh AK Gupta
Dr Tauqueer Ahmed
Dr Ramasubramanian V.
Dr GK Jha
Dr Cini Varghese
Sh Parveen Arya
Sh Sanjeev Panwar
Sh Rajendra Kumar
Sh H Ghosh
Sh SK Mahajan
Dr Ved Prakash
Sh AK Mogha

Society of Statistics, Computer and Applications, New Delhi

Prof SD Sharma

Dr VK Gupta
Dr VK Sharma
Dr (Mrs)Ranjana Agrawal
Smt Asha Saksena
Dr R Srivastava
Dr PK Batra
Dr Aloke Lahiri
Sh MR Vats
Dr Rajender Parsad
Sh DK Sehgal
Dr Seema Jaggi
Dr Ramasubramanian V
Dr AR Rao
Dr Cini Varghese
Ms Sonali Das
Dr Anil Kumar
Ms Anshu Dixit
Dr AK Paul
Sh H Ghosh
Sh Parveen Arya
Sh Sanjeev Panwar

Indian Society of Agricultural Sciences, New Delhi

Dr VK Bhatia
Dr Chandrahas
Sh JK Kapoor
Sh DK Sehgal
Sh Anil Kumar
Sh T Rai
Sh Satya Pal
Sh VK Jain
Sh GL Khurana
Sh HS Sikarwar
Dr Rajender Parsad
Sh Rajendra Kumar

Indian Science Congress Association, Calcutta

Prof SD Sharma
Dr AK Srivastava
Dr HVL Bathla
Dr Randhir Singh
Dr VK Sharma
Dr VK Bhatia
Dr BC Saxena

Dr KK Tyagi
Dr DL Ahuja
Sh RS Khatri
Dr Jagbir Singh
Dr MS Narang
Dr PK Batra
Dr. DK Agarwal
Sh SC Mehta
Sh AS Gupta
Sh JP Goyal
Sh DC Mathur
Sh SC Agarwal
Sh Bhagwan Das
Sh RC Gola
Sh Satya Pal
Sh VK Jain
Sh SC Sethi
Sh RM Sood
Sh AK Gupta
Dr Rajender Parsad
Dr Seema Jaggi
Dr T Ahmed
Dr GK Jha
Dr AK Paul
Sh H Ghosh
Dr Ramasubramanian V
Sh AK Mogha

Institute of Applied Statistics and Development Studies, Lucknow

Dr AK Srivastava

Indian Dairy Association(IDA)

Sh RS Khatri

Indian Society of Agricultural Economics, Mumbai

Dr (Mrs.) Sushila Kaul

Indian Society of Agricultural Marketing, Nagpur

Dr RK Pandey
Dr (Mrs.) Sushila Kaul
Dr SP Bhardwaj

Computer Society of India, Mumbai

Prof SD Sharma
Dr PK Malhotra
Dr RC Goyal
Dr VK Mahajan

Indian Statistical Association, Pune

Dr PK Batra

Indian Econometric Society, New Delhi

Dr VK Sharma

Agricultural Economics Research Association, New Delhi

Dr VK Sharma
Sh Satya Pal
Dr (Mrs.) Sushila Kaul

Indian Society for Medical Statistics, New Delhi

Dr Jagbir Singh

Society of Mathematical Sciences, Delhi

Dr Prajneshu

Farming System Research and Development Association, Modipuram, Meerut

Dr PK Batra
Sh NK Sharma
Smt Rajinder Kaur
Dr Rajender Parsad
Smt Ajit Kaur Bhatia
Sh VH Gupta
Sh Anil Kumar

Indian Society of Genetics and Plant Breeding

Dr VT Prabhakaran
Dr AR Rao

Andaman Science Association

Dr Anil Kumar

Indian Society of Agroforestry

Dr DP Handa

Indian Society of Remote Sensing

Dr Randhir Singh
Ms Prachi Misra

Calcutta Mathematical Society

Sh AK Mogha

Allahabad Mathematical Society

Sh AK Mogha

Ramanujan Mathematical Society

Sh AK Mogha

Indian Academy of Mathematics

Sh AK Mogha

Indian National Science Academy for Indian Journal of Pure and Applied Mathematics

Sh AK Mogha

Indian Statistical Institute, Calcutta for 'Sankhya'

Sh AK Mogha

Journal of Research, Birsa Agricultural University, Ranchi, Jharkhand Sh SD Wahi	**Indian Economic Association, Jabalpur** Dr SP Bhardwaj

(b) Offices in Professional Societies

Indian Society of Agricultural Statistics, New Delhi	
Prof. SD Sharma	Honorary Secretary, Executive Council, Member, Editorial Board
Dr AK Srivastava	Honorary Joint Secretary, Executive Council, Member, Editorial Board
Dr HVL Bathla	Member, Executive Council
Dr VK Gupta	Member, Executive Council, Member, Editorial Board
Dr Prajneshu	Member, Editorial Board
Dr PK Malhotra	Member, Executive Council, Member, Editorial Board
Dr VK Sharma	Member, Executive Council
Dr VK Bhatia	Honorary Joint Secretary, Executive Council, Member, Editorial Board
Dr Randhir Singh	Member, Editorial Board
Sh RS Khatri	Honorary Joint Secretary, Executive Council, Member, Editorial Board
Society of Statistics, Computer and Applications, New Delhi	
Prof SD Sharma	(i) Vice President (ii) Member of the Executive Council
Dr VK Gupta	(i) Managing Editor, Statistics and Applications (ii) Member of the Executive Council.
Dr Aloke Lahiri	Joint Secretary, Executive Council
Dr Rajender Parsad	Member, Editorial Board, Statistics and Applications
The Indian Journal of Agricultural Science	
Prof. SD Sharma	Member, Editorial Board
Indian Society of Agricultural Marketing, Nagpur	
Dr RK Pandey	Vice President
Journal of Statistical Planning and Inference	
Dr VK Gupta	Associate Editor

Aligarh Journal of Statistics	
Dr BC Saxena	Executive member of Editorial Board
Dr Tauqueer Ahmed	Executive member of Editorial Board
Farming Systems Research and Development Association	
Sh Anil Kumar	Joint Secretary of Executive Council
Indian Society of Agricultural Science	
Dr Rajender Parsad	Member, Editorial Board, Basic Sciences for Annals of Agricultural Research
Brassica News, Mustard Research and Promotion Consortium (PRPC), New Delhi	
Dr Seema Jaggi	Member, Editorial Board
Indian Society of Genetics and Plant Breeding	
Dr VT Prabhakaran	Member, Editorial Board
Institute of Applied Statistics & Development Studies	
Dr VK Gupta	Member, Governing Body

(C) Membership/Offices in Committees/Panels/Working Groups

Prof. SD Sharma

- Chairman of the Rajbhasha Implementation Committee of the Institute
- Chairman of the Grievance Committee of the Institute
- Chairman of the Senior Officers Meetings of the Institute
- Chairman of the Institute Joint Staff Council
- Chairman of the Institute Staff Research Council
- Chairman of the Institute Management Committee
- Chairman of the Library Advisory Committee of the Institute

- Chairman of the General Body meetings of the IASRI Co-operative Thrift and Credit Society
- Chairman of General Body meetings of the ICAR (IASRI) Co-operative Store
- Chairman of the Project Management Committee for formulating Long Term Mechanisation Strategy for States/Agro-Eco Zones, Ministry of Agriculture, Government of India, New Delhi
- Chairman of the IASRI Site Committee for NATP Projects
- Member of the Tenth Plan Working Group on Agricultural Statistics, Directorate of Economics & Statistics, Ministry of Agriculture, Government of India, New Delhi
- Member of the Tenth Plan, XIV Sub-Group on Livestock Statistics, Department of Animal Husbandry and Dairying, Ministry of Agriculture, Government of India, New Delhi
- Member of the Technical Advisory Committee for CSO Awards, Ministry of Statistics and Programme Implementation, Government of India, New Delhi
- Member of the National Statistical Commission Sub-Group on Agricultural Statistics, Ministry of Statistics and Programme Implementation, Government of India, New Delhi
- Member of the High Level Coordination Committee on Agricultural Statistics of Uttar Pradesh (Lucknow), Karnataka (Bangalore) and Haryana (Chandigarh) respectively
- Member of the Steering committee for Agricultural Census 2000-2001 and Input Survey 2001-2002, Ministry of Agriculture, Government of India, New Delhi
- Member of the High Level Inter-Divisional Committee for Zero Based Budgeting of Agricultural Engineering Division of ICAR, New Delhi
- Member of the PME Task Force Committee of NATP
- Member of the Review Committee for Interim Report on Financial Management Reviews for ICAR and Projects Manual for ICAR, New Delhi

- Member of the Scientific Advisory Panel for Agricultural Engineering, ICAR, New Delhi
- Member of the Research Advisory Committee, IASRI
- Member of NCAP Site Committee for NATP Projects
- Member of the Management of Productivity Sectional Committees MSD:3 and MSD:4 of the Bureau of Indian Standards, New Delhi
- Member of the Sub-Committee for ISO/TC-69 Working Group, MSD-3:3 of the Bureau of Indian Standards.

Dr AK Srivastava

- Vigilance Officer in the Institute
- Member of the Management Committee of the Institute
- Chairman of the Works Committee in the Institute
- Member of the Institute Joint Staff Council
- Member of the Central Examining Committee for conducting Comprehensive Examination and Pre-comprehensive Examination in the discipline of Agricultural Statistics and Computer Applications
- Chairman of Consultancy Processing Cell of the Institute in which the proposals under resource generation programme through training, consultancy, contract research are processed
- Member Secretary of Quinquennial Review Team (QRT) of IASRI for the period 1996-2000
- Chairman of working group of Experts for reviewing agricultural Census Operations in the country and the Planning of Agricultural Census 2000-2001
- Member of the sub-group to review the improvement of crop statistics (ICS) programme with reference to survey design, constituted by National Statistical Commission
- Member of the Programme Advisory Committee (PAC), National Science and Technology Management Information System (NSTMIS) Scheme constituted by Department of Science and Technology, New Delhi

- Member of the committee to review the contents of the compendium of Environmental Statistics being brought out by Central Statistical Organisation
- Member (alternate) of the Management and Productivity Sectional Committee MSD 3 and 4, Bureau of Indian Standards
- Member of the Technical Committee of Direction for Improvement of Animal Husbandry and Dairying Statistics
- Member of Technical Advisory Committee, Education Surveys, NCERT, New Delhi
- Member of Technical Advisory Committee on Sample Surveys of Registered Small Scale Industries (SSI) Units constituted by Ministry of Industries
- Member of Working group on 59th Round of National Sample Survey (January 2003 to December, 2003) constituted by Ministry of Statistics and Programme Implementation, Govt. of India
- Member of Working group to finalise the sample design, schedules of enquiry and instructions etc. relating to the Situation Assessment Survey (SAS) of Indian Farmers to be conducted by NSSO on behalf of DOAC, Ministry of Agriculture

Dr VK Gupta

- Convenor of Technical Session on Identification of problems for future research in XIII National Conference of Agricultural Research Statisticians held at PAU, Ludhiana during Nov. 6-8, 2001.
- Chaired the XIV session of contributed papers in the International Conference on Design of Experiments- Recent Trends and Future Directions organized jointly by university of Delhi and ISI from Dec. 27-30, 2001 at Department of Statistics, Delhi University.
- Convenor of Symposium on Statistical Models for Optimizing Nutrient Recommendations for Cropping Systems during the 55th Annual Conference of Indian Society of Agricultural Engineering and Indian Institute of Soil Science at Nabi Bagh, Berasia Road, Bhopal during Jan. 15-17, 2002.

Dr. P K Malhotra	• Chairman of Board of Studies in Computer Applications • Member of the "Standing Committee on Scholarships, Financial Assistance and Academic Progress" of the PG School, IARI, New Delhi.
Dr HVL Bathla	• Member-Secretary, Research Advisory Council of the Institute. • Member, Management Committee of the Institute. • Course Director of the International training programme on "Development of Crop Statistics Methodology" sponsored by Food and Agriculture organisation, for the participants from Govt. of Eritrea, organised at the Institute during Apr 13-27, 2001. • Chairman and Course Director of the Workshop on "Economic Accounts for Agriculture" jointly conducted by the Food and Agriculture Organization (FAO) of the United Nations and the United Nations Statistical Institute for Asia and the Pacific (SIAP) organised at IASRI, New Delhi during Dec. 10-15, 2001. • Member of Selection Committee for selection of Research Associate in the NATP project "Pilot study on assessment of harvest and post harvest losses" • Expert at Maharana Pratap University of Agriculture and Technology, Udaipur for the post of Professor (Statistics) • Convenor of the Symposium on "Existing Statistical Methodologies- Current Status and Challenges" in the XIII Agricultural Research Statisticians Conference at PAU, Ludhiana during Nov. 6-8, 2001 • Nominated by the Vice Chancellor, Ch. Charan Singh Haryana Agriculture University, Hisar as an expert for the Assessment Committee • Member of Indigenous Technical Knowledge Information Committee in connection with NATP mission mode project on collection, documentation and validation of ITK. • Team Leader for 6th All India Entrance Examination for admission to Under Graduate Course for the

	session 2001-2002 conducted by the Education Division of the ICAR for the centre at RAU, Samastipur, Pusa, Bihar • Member, Project Management Committee. • Nominated by the Expert Committee of Specifications of imported fertilisers as Chairman of the Committee to review the existing methodology of drawal of samples from urea vessels at ports and suggest improvements. • Member, Technical Committee of Direction for Improvement of Animal Husbandry and Dairy Statistics.
Dr. Ranjana Agrawal	• Member, Committee (IARI) for assessing the cases of scientists for promotion to Scientist (Senior scale) / Scientist (S.G.)/ Sr. Scientist under Career Advancement Scheme. • Member, Committee (IGFRI, Jhansi) for assessing the cases of scientists for promotion to Scientist (Senior scale) / Scientist (S.G.)/ Sr. Scientist under Career Advancement Scheme. • Member, Selection Committee for selecting Research Associate - NCIPM.
Dr Randhir Singh	• Chairman of Selection Committee for selection of Research Associate in the NATP project "Development of weather based forecasting technology systems for crops, pests and diseases" • Member of Selection Committee for selection of Research Associate in the NATP project "INARIS" • Expert Member Selection Committee for selection of Asstt. Professor and Professor of Statistics of PAU, Ludhiana. • Expert Member nominated by the DG, ICAR of DPC for promotion of Scientists under career advancement, scheme of ICAR for CSWRI Avikanagar, CRRI Cuttack, IGFRI Jhansi and CSWCRTI Dehradun. • Course Director of the Senior Certificate Course of the Institute.

	• Project Coordinator of NATP Mission Mode Project "INARIS". • Group Leader for Remote Sensing and GIS Applications Group. • Member of "Committee of experts to examine the use of remote sensing technology in detection of spread of diseases on crops including cotton" constituted by Ministry of Agriculture and Cooperation, Govt. of India. • Examiner for M.Sc./Ph.D. thesis and examinations of University of Rajasthan, Jaipur; Meerut University, Meerut and HAU, Hissar.
Dr VK Sharma	• Convenor of the IV session on Teaching of Agricultural Statistics in NARS-status and challenges ahead in the XIII National Conference of the Agricultural Research Statisticians held at PAU, Ludhiana from Nov. 6-8, 2001 • Chaired Ist contributed paper reading session in the 4th Annual conference of the society of statistics, computer and application held at Saurashtra University, Rajkot from Nov. 24-26, 2001 • Member of the Executive Council and also of the Standing Committee on Faculty and Discipline of the PG School, IARI
Dr Prajneshu	• Member, Screening Committee on Research Collaboration and Doctoral / Post-Doctoral fellowship
Dr KK Tyagi	• Secretary, Divisional Research Committee of Division of Sample Survey. • Associate Course Director of the International training programme on "Development of Crop Statistics Methodology" sponsored by Food and Agriculture organisation, for the participants from Govt. of Eritrea, organised at the Institute during Apr. 13-27, 2001. • Convenor of the Symposium on "Role of Statistics in Farm Mechanisation Studies" to be organised during the 55th Annual Conference of Indian Society of Agricultural Statistics held at CIAE, Bhopal during Jan. 15-17, 2002.

	• Member "Central Examination Committee" at the Institute. • Member, Institute Sports Committee. • Member, Works & Maintenance Committee of the Institute. • Vice-President, IASRI Recreation & Welfare Club.
Dr DK Agarwal	• Member-Secretary, SRC • Nodal Officer of IPR • Nodal Officer regarding the study on deployment of research resources to be carried out by Dr DN Jha, National Professor • Member, Consultancy Processing Cell • Member-Secretary, Senior Officers Meeting • Convenor of the Technical Session on Action taken on the recommendations during the last Conference and Plenary Session on discussion of recommendations made during different Technical Sessions in XIII National Conference of Agricultural Research Statisticians held at PAU, Ludhiana during Nov. 6-8, 2001. • Incharge, Project Management and Evaluation Cell
Dr UC Sud	• Course Director of a training programme on "Sample Surveys related to the estimation of area and production of fruits and vegetables" sponsored by the Department of Horticulture, Govt. of Haryana for four officials of their department organised at the Institute during Aug. 22-25, 2001.
Dr PK Batra	• An invited expert in Scientific Advisory Committee on the NATP Mission Mode Project for Rainfed based production system held at CRIDA, Hyderabad during May, 27-29, 2001.
Dr Jagbir Singh	• Member of Departmental Promotion/ Assessment/ Selection Committees in the Institute.
Sh DC Mathur	• ICAR Observer for "6th All India Entrance Examination for admission to Under Graduate Programme & Award of National Talent Scholarship in Agri. & Allied Subjects" for the academic session 2001-2002 at PAU, Ludhiana.

Sh JP Goyal	• ICAR Observer for "6th All India Entrance Examination for admission to Under Graduate Programme & Award of National Talent Scholarship in Agri. & Allied Subjects" for the academic session 2001-2002 at Birsa Agriculture University, Ranchi.
Sh. K. C. Gupta	• Member, Sampadak Mandal, Sansthan Raajbhasha Karyanvayan Samiti
Sh. H.S. Sikarwar	• Member Secretary, Board of Studies, Computer Applications
Dr Tauqueer Ahmad	• Appointed External Examiner by Aligarh Muslim University (AMU) and conducted the Practical Examination of B.Sc. I year (Statistics) held on May 30-31, 2001 in the Deptt. of Statistics & Operations Research, AMU, Aligarh.
Dr AK Paul	• Member Secretary, Board of Studies • Executive Member, Seminar Association

LINKAGES

CHAPTER -8

LINKAGES AND COLLABORATION IN INDIA AND ABROAD INCLUDING OUTSIDE FUNDED PROJECTS

Sl. No.	Title	Collaborative Agency	Start	Completion
1.	Study of land use statistics through integrated modelling using geographic information system.	AIS & LUS, Ministry of Agriculture. (A.P. Cess Fund)	Sept. 01 1999	Aug.31,2002
2.	Sampling procedure for selection of representative samples of fertiliser from ships.	Central Fertiliser Quality Control & Training Institute, Faridabad. (A.P. Cess Fund)	May 01, 2000	Apr. 30,2001
3.	A study relating to formulating long-term machanisation strategy for each agro-climatic zone/ State.	Department of Agriculture and Cooperation, Ministry of Agriculture. (Funded from Department of Agriculture and Cooperation, Ministry of Agriculture).	July 01, 2000	June 30, 2003
4.	A pilot study on cost of production of Coconut in Kerala.	Central Plantation Crops Research Institute, Kasargod. (Funded from Coconut Development Board, Kochi, Kerala)	Aug. 01, 2000	Dec. 31, 2002
5.	Estimation of wool production – emerging data needs and a methodological reappraisal.	Central Sheep & Wool Research Institute, Avikanagar (A.P. Cess Fund)	Apr. 01, 2001	Mar 31, 2004
6.	Assessment of harvest and post-harvest losses.	Seven ICAR Institutes/NATP.	Apr. 01, 2001	Dec. 31, 2003

Sl. No.	Title	Collaborative Agency	Start	Completion
		(Funded under NATP Mission Mode Programme).		
7.	Crop yield estimation of smaller area level using farmers' estimates. (A small study taken in district Karnal).	Department of Agriculture, Haryana		
8.	Planning, designing and analysis of experiments planned on stations under PDCSR	Project Directorate of Cropping System Research, Modipuram	Apr., 1997	Mar., 2002
9.	Planning, designing and analysis on Farm-experiments under PDCSR	Project Directorate of Cropping System Research	Apr., 1997	Mar., 2002
10.	Planning, designing and analysis of data relating to experiments conducted under AICRP on LTFE	Project Coordinator (LTFE) IISS, Bhopal	Apr., 1997	Mar., 2002
11.	Planning, designing and analysis of experiments relating to AICRP on Soil test crop response correlation	Project co-ordinator (STCR), Indian Institute of Soil Science (I.C.A.R.), Bhopal (IASRI Project)	Mar., 2000	Feb., 2003
12.	Design and Analysis of Agroforestry Experiments	IGFRI, Jhansi	Mar., 2000	Aug., 2003
13.	Design and Analysis of On-Farm and On-Station Agricultural Research: A Revisit	Collaboration with Institute of Applied Statistics and Development Studies, Lucknow (A.P. Cess Fund)	Sept. 15, 2001	Sept. 14, 2003
14.	Assessment of Spatial and temporal variation of soil microbial diversity in rice-wheat cropping	Collaboration with IARI, Environmental Sciences in NATP mode.	Jul., 2001	Mar., 2004

Sl. No.	Title	Collaborative Agency	Start	Completion
	system with different management practices			
15.	Precision farming for sustainable rice-wheat Cropping System	Collaborative with IARI, Division of Agronomy	2001	2003
16.	Development of Statistical procedures for selecting genotypes simultaneously for yield and stability	Collaborative with IARI	Apr. 01, 2000	Mar. 31, 2003
17.	Pilot study on forecasting of brood-lac yield from Butea monosperma (Palas).	I.L.R.I, Ranchi, AP Cess Fund	Aug., 1999	Aug., 2002
18.	Forecasting the loss in yield due to weeds.	IARI, New Delhi	May, 1999	Oct., 2002
19.	Forecasting of fish production from ponds	CIFA, Bhubaneshwar	Aug., 1999	Jul., 2002
20.	Studies on bio-ecology and population dynamics of major pests of mango (hoppers, fruit fly, leaf webber and inflorescence midge) and guava (fruit borer).	CISH, Lucknow	Oct.,1999	Mar., 2004
21.	Epidemiology and forecasting of powdery mildew and anthracnose.	CISH, Lucknow	Oct.,1999	Dec., 2002
22.	To develop model of forewarning about infestation	N. D. Univ. of Agri. & Tech. Kumarganj	Nov.,1999	Oct., 2002

Sl. No.	Title	Collaborative Agency	Start	Completion
	of insects for paddy crop.			
23.	An Econometric Study of Technological Dualism in Egg Production	Punjab Government, Chandigarh	Oct. 01, 2000	Continuing
24.	Jai-Vigyan National Science and Technology ICAR Mission on Household Food and Nutritional Security for Tribal, Backward and Hilly Areas	ICAR Institutes and Agricultural Universities. (NATP Mission Mode)	Apr. 01, 2001	Continuing
25.	Study of Lac Marketing in India	Central Lac Research Institute, Ranchi (AP Cess Fund)	Nov. 15, 2001	Continuing
26.	Institutionalization of Research Priority Setting, Monitoring and Evaluation and Networking of Social Scientists	NCAP and NAARM / NATP (NATP, PME project under O&M)	Jun. 01, 1999	Nov., 2003
27.	Integrated National Agricultural Resources Information System	13 ICAR Institutes / (NATP Mission Mode)	Apr. 01, 2001	Dec. 31, 2003
28.	Expert System of Extension	IARI / NATP CGP	Apr. 01, 2001	Dec. 31, 2003

RCMU UNIT

CHAPTER -9

RESEARCH COORDINATION AND MANAGEMENT UNIT

Research Coordination and Management Unit (RCMU) is responsible for documentation and dissemination of scientific output of the Institute through IASRI News and Annual Report etc. It also organises National Conferences of Agricultural Research Statisticians once in three years and conducts meetings of Sr Officers (SOM) every month. The Unit also assists the Research Advisory Council (RAC) and Quinquennial Review Team (QRT) and is responsible for correspondence with ICAR, ICAR Institutes, SAUs and other organisations in India and abroad. The other functions of the unit are: to examine the new Research Project proposals before these are considered by the SRC in respect of importance of problems, its design and final requirements; to monitor the progress of on-going research projects and to bring out half yearly monitoring progress reports; to prepare Annual Action Plan, Activity Milestone, EFC Memo, to maintain the Research Project Files and also their submission to ARIC (ICAR) and preparation of X Plan proposal. The Unit also provides help in Art, Photography & Reprographic Services.

The following activities were undertaken by the Unit during the year under report:

Publications

- Annual Report of the Institute for the year 2000-01
- IASRI News, Vol. 5, No.4, Jan.–Mar., 2001
- IASRI News, Vol. 6, No. 1, Apr.–Jun., 2001
- IASRI News, Vol. 6, No. 2, Jul.–Sep., 2001
- IASRI News, Vol. 6, No.3, Oct.–Dec., 2001 (Draft)
- Action taken report on the recommendations of XII National Conference of Agricultural Research Statisticians held at RCA, Udaipur (Rajasthan) during Aug. 08-10, 1998
- Background material of IASRI for QRT (1996-2000)

Monitoring Progress Report

Half yearly Summary of progress of on-going research projects ending March 31, 2001 and Sept 30, 2001

Communication of Research Material to:

(i) ICAR

- Material for preparation of DARE-ICAR Annual Report for the year 2001-2002
- Action taken report on the proceedings of the meeting of Directors of ICAR Institutes held on October 12-13, 2000 along with one page brief note about various major accomplishment faced by the Institute during 2000 and agenda items for the next meeting held during July 23-24, 2001.
- Monthly progress report on President's Address to Parliament sent every month to ADG (ESM), ICAR.
- Action taken report on the recommendations made in the 71st Annual General Meeting of the ICAR Society held on September 15, 2000
- Information regarding implementation of persons with disabilities, protection of rights and full participation Act 1995
- Brief note on the directions being followed towards achieving Vision-2020
- Comments on the recommendations of 88th Annual Session of the Indian Science Congress (ISC)
- Follow up action taken report on the proceedings of the Directors' Meeting of ICAR Institute held during July 23-24, 2001
- X Plan proposal
- Zero Base Budgeting as per the guidelines of Council.
- Information of different Research Project Files (RPF I, II, III) of various divisions of the Institute.
- Quarterly Progress Report of various projects as well as financial aspects.
- Quarterly information for 'ICAR Reporter' and 'ICAR News'
- Monthly Progress Report for the Cabinet Secretariat

(ii) Other Organizations in India

Department of Science & Technology, Ministry of Science and Technology, New Delhi

- Questionnaire on National Survey on resources devoted to scientific and technological (S&T) activities, 2000-2002

Central Statistical Organisation, New Delhi

- Quarterly information for CSO Newsletter

Ministry of Statistics and Programme Implementation, New Delhi

- Role of IASRI in strengthening the Statistical System

Conference organised

The XIII National Conference of Agricultural Research Statisticians of the ICAR Institutes, Project Directorates and Agricultural Universities and State Departments of Agriculture and Animal Husbandry was organised at Punjab Agricultural University, Ludhiana (Punjab) during Nov. 06-08, 2001. Prof NS Sastry, Director General, National Sample Survey Organisation, New Delhi inaugurated the Conference on Nov 6, 2001. The theme of the Conference was Research in Agricultural Statistics and Computer Application - Status and Challenges Ahead. Apart from plenary session there were six Technical Sessions as follows:

Session I	:	**Action taken on the recommendations made during the last Conference**
Session II	:	**Existing Statistical Methodologies – Current Status and Challenges**
Session III	:	**Computer Application in Agricultural Research - Status and Challenges**
Session IV	:	**Teaching of Agricultural Statistics and Computer Application – Status and Challenges**
Session V	:	**Identification of Problems in Future Research**
Session VI	:	**Improvement of Quality of Agricultural Statistics**
Plenary Session	:	**Discussion of Recommendations made during different Technical Sessions**

About 94 scientists/statisticians from various ICAR Institu tes and State Agricultural Universities attended the Conference.

The recommendations of the XIII National Conference are as under:

1. It was felt that there should be closer involvement of State Agriculture Universities in the State Agriculture Statistics System. This will help the State Governments in effecting improvements in crop estimation surveys and also the SAUs in having a closer touch with the data generation system in the field of Agriculture. For this purpose, it would be necessary to have a mechanism. For example, a technical advisory committee involving agencies like NSSO, IASRI and SASA's etc. should be formed to look into technical aspects of Agriculture Statistics.
2. States should evolve a system in which live data from Crop Estimation Surveys and other data sources could be shared with Agriculture Universities on requests.
3. Agriculture Universities may also take up methodological studies to provide solution to unresolved issues and grey areas like Remote Sensing Applications, methods of estimation of production from horticulture sector, treatment of mixed crops, floriculture etc. and small area estimation techniques.

4. State Governments should take steps to address the issues raised in ICS Status Reports for bringing improvements in crop production statistics is a time bound manner.

5. Research conducted in newer emerging areas in design of experiments should be need based. Concerted efforts should be made for disseminating and popularising the research for effective usefulness of scientists in NARS.

6. Studies need to be undertaken for examining statistical distribution properties along with robust and resistant estimation of genetic parameters.

7. There is a need to develop Web based Information System as well as modify the existing stand alone system so that information reaches the stake holder on the internet. There is also need to convert or develop information system in Hindi/Regional languages so that information is utilize effectively at the KVKs and by the farmers.

8. The computer application in agriculture research is multi-disciplinary effort requiring collaboration among subject matter specialists and computer professionals in particular in the areas of expert system and decision support system development. The development of these systems requires inter-institutional and inter-disciplinary effort and also collaboration with the international institutions that are leaders in these areas apart from financial support for such programmes.

9. The development of data warehouse is a welcome initiative. However, to sustain the development of data warehouse and its maintenance, continuing financial support will be required due to high cost of such activities. Such a support may be ensured.

10. It has become difficult to maintain the existing software due to increase in the cost of up-grades. It is also difficult to get technical support in case of individual purchases at the Institute level. It is recommended that multi-user/multi-site (Enterprise licence) for commonly used software may be obtained by an Apex Body like ICAR. This will be a cost effective solution and better technical support will be available.

11. Due to shortage of trained manpower for supporting IT activities, it has become difficult to manage the networks and also to develop application software. The recruitment policy does not permit filling up of vacant technical positions. This policy needs a review.

12. The development in the areas of IT are taking place at a very fast pace and it becomes essential to train the manpower in the new emerging technologies on continuing basis. These HRD activities need additional support.

13. The information generated in the Statisticians Conference, in particular the recommendations emerging out of deliberations may be put on IASRI's Web Page/Agricultural Statisticians Network, so that the same are available to the Statisticians for needful action.

14. For admission to M.Sc. (Agril. Stat.) eligibility conditions should be Bachelor's Degree in Science/ Agriculture/Horticulture/Agro-Forestry/Sericulture/Marketing with mathematics atleast upto +2 level.

15. Mathematics and Statistics should be made elective subjects during B.Sc. (Agri.) degree course.

16. The duration of M.Sc. (Agril. Stat.) Course should be the same for both the agricultural and non-agricultural graduates.

17. Since the knowledge in each branch of statistics is increasing at a fast pace, there is a need to shift some of the topics from the syllabus of M.Sc. (Agril. Stat.) to the syllabus of undergraduate programme so that some advanced topics could be included in the M.Sc. (Agril. Stat.) programme.

18. In order to strengthen the professional capabilities of the teachers, the teachers should be given refresher and advanced training, at the national and international level, particularly in the new emerging areas of the Statistical science. Similarly, flow of faculty from Institutions of learning, within and outside the country, should be encouraged to enhance the capabilities of teachers.

19. There should be uniformity in the minimum course curriculum of statistics at all levels of education, namely B.Sc., M.Sc. and Ph.D.

20. While providing computer orientation to course curriculum, the basic principles of statistical tools should not be lost sight of. The students must be given practice to have the essential feel of the basic practical steps and understand the intricacies of essential statistical techniques.

21. The use of computers needs to be integrated with the classroom teaching. The theory needs to be supported and explained by live practical examples through computers.

22. M.Sc. (Agril. Stat.) students need to be trained in the use of computers and application of various standard statistical software packages for analysis of data using different statistical techniques. Some indigenous software packages may also be developed according to the need of the subject. The new audio-visual aids should also be used to improve the quality of teaching and to make it more interesting and informative.

23. There is need to initiate programme of Distance Education in Agricultural Statistics and Computer Application.

24. Statistical modeling techniques such as Fuzzy regression, non-parametric regression, non-linear time series and stochastic differential equations may be employed for the data analysis. Data mining tools and ANN should be used for classification and modeling purposes.

25. Application of Bayesian Inference in the analysis of survey data, designing and analysis of experimental data, estimation of genetic parameters, forecasting, etc. may be explored.

26. Estimation of genetic parameters in non-linear models, genetic evaluation in binary response, robust estimation of parameters in the presence of outlier(s), designing an experiment under non-linear models should be taken up.

27. Design of experiments and statistical models should be developed for cropping systems (both on stations and on farm), agro-forestry experiments, for sustainable agriculture, etc. rather than for individual components.

28. Designing and analysis aspects of post-harvest experiments, food processing experiments, experiments pertaining to fishery sciences need to be taken up.

29. Linkages with the Agricultural Scientists should be strengthened and bottleneck, if any, in implementing the research finding in agricultural research should be identified and steps should be undertaken to remove these. Consultancy should also be strengthened.

30. Efforts should be strengthened for the development of indigenous graphic users interface based, statistical software package and existing packages may be modified or updated to suit to the new computing environment.

31. There is a need to develop decision support systems integrating simulation models with GIS.

32. Re-sampling procedure may be employed for estimation of variance components from complex survey data, genetic parameters, etc.

33. Reappraisal of existing sampling methodologies should be undertaken with special reference to cost of cultivation of major principle crops and estimation of marine fisheries.

34. Modelling for forecasting crop yields, incidence of pests and diseases, etc. need to be strengthened. Remote sensing data and the tools like GIS, ANN, etc. should be rigorously utilized for this purpose. Computer simulation techniques may usefully be employed in developing crop growth models.

35. Security mechanism of integrated data bases against natural disaster and other unforeseen situations need to be developed.

36. There is a need for closer examination on extension of land use statistics from nine fold classifications.

37. Use of remote sensing satellite data for providing frame for the general crop estimation surveys and also for improving estimation of crop yield at small areas and forecasting of crop yield need to be further explored.

38. The quality aspect of various databases need to be seriously looked into while attempting to develop a warehouse environment.

39. There should be closer collaboration between NSSO, CSO, DES, IASRI, State Agricultural Universities and SASA's for taking empirical studies for improving the quality of data.

Meetings organisation

- The Unit organised thirteen Senior Officers meetings of the Institute to discuss the monthly achievements, shortfalls, if any, and obstacles in achievements in terms of various activities of the Institute including research, teaching, training, projects, publications, library, administrative, financial and others. Such meetings were held on Apr 03, May 08, Jun 04, Jul. 06, Aug. 09, Sep. 06, Oct. 05, Nov. 19, Dec. 18, 2001; Jan 1, Jan. 19, Feb. 13, and Mar. 18, 2002. The meetings were chaired by the Director. The proceedings were prepared and distributed.

Research Advisory Council (RAC)

- Unit organised sixth Research Advisory Council (RAC) meeting of the Institute on September 24, 2001 under the Chairmanship of Sh VR Rao, Former Director General, CSO, New Delhi. Proceedings were prepared and Action taken report on the minutes of the last RAC meeting & agenda items were prepared.

Staff Research Council (SRC)

- Material needed for the meetings of the Institute was prepared, action initiated for consideration of new research project proposals and as well as for the review of the progress of the On-Going research projects. SRC meeting organised on August 01, 2001 and February 15, 2002 & proceedings prepared.

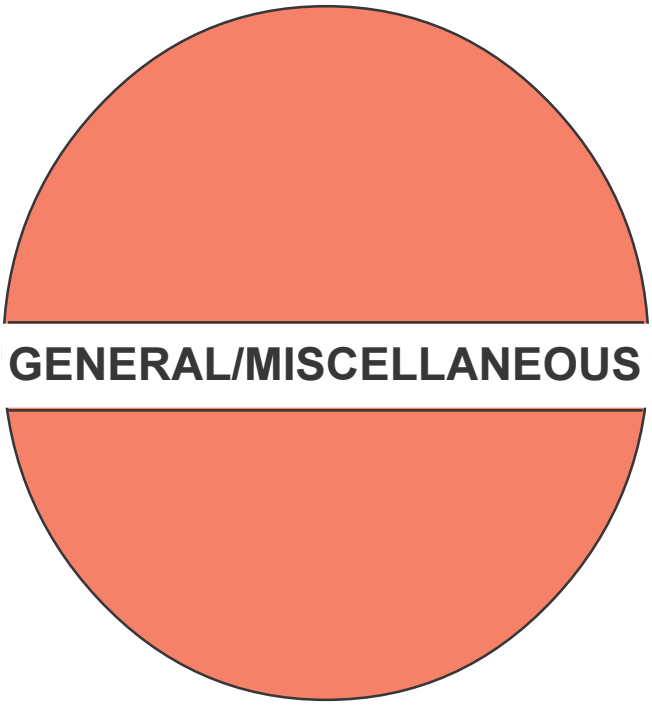
Art, Photography and Reprography

Assisted the scientists in preparing diagrams, charts, histograms and maps for research publications and also visual display of research findings in the exhibition room. It also assisted in transcribing the lectures write-ups on transparencies.

Photographic jobs including exposing, processing and printing of about 650 photographs taken on various important occasions of important research and extension activities of the Institute and some slides were prepared. In addition, enlargement of good number of photographs was also done.

The charts and graphs were up-dated in the light of recent research findings for display in the exhibition room. A number of new charts were also added to the existing ones depicting current research findings. Photographs taken at the special occasions were also displayed. Latest publications were also added.

On Gestetner Copy Printer 5327 machine installed at the unit lab about 2,21 917 copies of 4733 pages for 469 jobs were multi-copied and supplied to various users of the Institute.


GENERAL/MISCELLANEOUS

PUBLICATIONS

CHAPTER -10

LIST OF PUBLICATIONS

Papers Published

1. AGRAWAL, RANJANA; JAIN, R.C. AND MEHTA, S.C. (2001). Yield forecast based on weather variables and agricultural inputs on agro-climatic zone basis. *Indian Journal of Agricultural Science, Vol. 71(7).*

2. BATRA, PK and PARSAD, RAJENDER (2001). Robustness of standard reinforced balanced incomplete block designs against interchange of a pair of treatments. *Journal of the Indian Statistical Association, Vol. 39: 65-78.*

3. BHAR, L. AND GUPTA V.K. (2001). A useful statistic for studying outliers in experimental designs. *Sankhya B, 63: 338-350.*

4. CHAND, LAL; WAHI, S.D, and LAL, PARKASH. (1998) Estimation of heritability and genetic correlation in the parameter space. *Ind. J .Anim. Gen. and Breeding, 20(1), 37-40*.

5. DEKA, BC; SETHI, V; PARSAD, RAJENDER and BATRA, PK (2001). Use of experiments with mixture methodology for quality evaluation of mixed fruit juice/pulp RTS beverages. *Journal of Food Science and Technology, Vol.38(6): 615-618.*

6. DEY, AMITAVA; SRIVASTAVA, R and PARSAD, RAJENDER (2001). Robustness of block designs for diallel crosses against missing observations. *Journal of Indian Society of Agricultural Statistics, Vol. 54(3): 376-384.*

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3. A statistical investigation on the long-term effect of fertilizer on productivity of cereal *by V.K. Sharma and Rajinder Kaur.*

4. Development of early warning and yield assessment models for rainfed crops based on agrometeorological indices *by Asha Saksena, R.C. Jain (Retired on 30.11.99), R.L. Yadav*

5. Forecasting fish production from ponds *by Lalmohan Bhar, S.S. Walia and A.K. Roy*

DISSERTATIONS APPROVED

(a) Ph.D. (Agricultural Statistics)

1. J.S. Dhekale - Analytical Techniques in Intercropping Experiments

Intercropping research attracted worldwide attention and number of experiments are being conducted to study different objectives like maximization of yield, identification intercropping systems or varieties suitable for cultivation, etc. There is no standard method of analysis therefore, an attempt has been made to study various analytical techniques used in analysis of intercropping experiments.

Analytical techniques have been studied by classifying intercropping experiments into two types. Type I with sole crop treatments and type II without sole crop treatments. For type I experiments an analogy between experiments with mixtures and replacement series intercropping experiments is established and analytical method has been proposed, also the type I experiments of replacement series consisting of other factors like spacing fertilizer etc. are analyzed by mixture x process variable techniques. For additive

series experiments, contrast analysis has been used.

Bivariate method of analysis of intercropping experiments is proposed and three tests are proposed for testing single sole crop treatment versus intercropped treatment, both sole crop treatment versus intercropped treatment and for testing difference between two intercropped treatments.

Intercropping is stable cropping system, but when more than one system is available then method for identifying stable intercropping system in presence of environmental covariate is proposed and explained with suitable example.

(Guide: Dr V.K.Gupta)

2. Prachi Misra - Application of Spatial Statistics in Agricultural Surveys

Estimation of crop area and crop production forms the most important dimension around which the overall agricultural statistics system of our country revolves. Forecasting of crop production is one of the important aspects of agricultural statistics system. The Production of the major agricultural crops in the country is estimated on the basis of the estimates of area under the crop and the average yield per unit area. For estimating area under a crop at district level, different approaches have been followed. In agricultural surveys the parameters of interest are often geographical in nature i.e. they carry the effect of location to which they belong. This implies that the data is spatial in nature but it is sampled using the traditional sampling designs like simple random sampling, stratified sampling and systematic sampling which do not give reliable and consistent estimates in case of spatial data. Thus, for spatial data there is need for developing spatial sampling designs, which take care of the dependency in the data. In this study an attempt has been made to improve the conventional survey methodology for agricultural surveys by using the newer technologies of Remote sensing and GIS.

Spatial sampling is a particularly difficult problem to deal with, since spatial units are not independent observations. Spatial sampling requires the researcher to recognize the degree of dependence in the spatial data. The proposed spatial sampling techniques are based on the fact that the neighbouring units tend to be homogeneous when the parameter of interest is geographical in nature. Once a particular unit is included in the sample, the neighboring units are not likely to provide much additional information of the target population. The proposed sampling techniques take care of the location effect, which is the most important property of the spatial data. All units, which are contiguous i.e. the units that touch the boundary of a particular unit are regarded as its neighbours. The spatial correlation for an auxiliary character is used to give higher probability of selection to distant units as compared to neighbouring units. The basic principle of sample selection in case of spatial sampling is that the probability of selection of any unit increases as the distance from the units (area) already selected in the sample increases. Suitable unbiased estimators, which take into account the order of the draw, have been suggested.

On the basis of the method of sample selection and estimation four spatial sampling methods have been suggested. These are (i) Contiguous Unit Based Spatial Sampling (CUBSS) Technique (ii) Stratified Contiguous Unit Based Spatial Sampling Technique (iii) Modified Contiguous Unit Based Spatial Sampling Technique (iv) Stratified Modified Contiguous Unit Based Spatial Sampling Technique. The study has been conducted for Rohtak district of Haryana state at village level. The villages are considered as the regular lattice case i.e. assuming that the population consists of regular units. A simulation study is conducted to study the performance of the proposed estimators as compared to the existing ones generally used for sampling spatial data. For the simulation study, the irrigated area of the district has been taken as the study character and the cultivated area as the auxiliary character. The results of the study reveal that the proposed sampling techniques provide more efficient, stable and reliable estimates as compared to the various existing spatial sampling techniques.

The spatial data are not only dependent in nature but is highly irregular as in case of irregular lattice the shape and size of the units vary to a great extent. This additional problem of irregularity along with dependency of the data has also been studied. To consider this problem the use of distance-based neighbour has been suggested. Based on these neighbours the modified formula for spatial correlation is obtained. Four spatial sampling techniques are proposed for irregular area units. These are (i) Distance Unit Based Spatial Sampling (DUBSS) Technique (ii) Stratified Distance Unit Based Spatial Sampling Technique (iii) Modified Distance Unit Based Spatial Sampling Technique (iv) Stratified Modified Distance Unit Based Spatial Sampling Technique. The efficiency of these estimators are compared with the one obtained for regular lattice case. The results show that the spatial sampling techniques proposed for irregular area provide more efficient estimators.

The advent of remote sensing technology and its potential in the field of agriculture has given new opportunities for improving crop acreage procedures. However, in neither of these approaches spatial information of the crop distribution is taken into consideration though studies have shown that there exist spatial dependence in remotely sensed data. A suitable methodology is developed for estimating crop area by integrating remote sensing and GIS based spatial sampling approach. An empirical study to estimate the area under wheat crop for district Rohtak, Haryana for the year 1995-96 using IRS-1B, LISS-II data has been conducted by using average NDVI of the village as an auxiliary character. Further, the estimates obtained from this approach are compared with those obtained from usual remote sensing method. The results of the study show that inclusion of remote sensing parameter in GIS assisted spatial sampling techniques enhance the performance of the estimators.

Thus, in this study some new and more efficient spatial sampling techniques have been proposed. The results of the study point out that in spatial surveys, a considerable gain in efficiency of the estimators could be achieved by using a GIS and remote sensing assisted spatial sampling strategy, which helps in better allocation of resources leading to higher levels of accuracy of the estimates

(Guide: Dr. Randhir Singh)

(b) M.Sc. (Agricultural Statistics)

1. Jawaid Ashraf - Designs for two Non-interacting Sets of Treatments Applied in Succession.

The use of same experimental material for several successive experiments is quite prevalent in the fields like horticulture, animal sciences and forestry, where subject under investigation is long lived. At every succession or stage a different set of treatments is applied and the response is recorded only at the end after the final application of treatments. Designs with v_1 and v_2 treatments in first and second sets applied at first and second stages respectively have been considered with the arrangement of the experimental material in a structure of b blocks. It is assumed that the two sets of treatments are non-interacting. Some methods of construction of block designs for different characterizations have been obtained that are structurally complete.

Design patterns with these characterizations admit simple and straightforward analysis. The methods have been obtained by developing the initial block consisting of pair of treatments from both the sets. The characterization properties like variance balance of these designs have been studied. The methods are also developed based on the superimposition principle. A catalogue of the designs obtained by these methods for two non-interacting sets of treatments has been prepared. Method of constructing structurally incomplete block designs for two sets of treatments applied in succession has been developed making use of combination of some known designs like randomized block designs, Balanced incomplete block designs etc. A catalogue of the designs obtained giving layout plans of the designs is also prepared.

(Guide: Dr. Seema Jaggi)

2. S.K.Satpati - Nested Block Designs and their Applications

A nested block design is defined as a design with two systems of blocks where the second system (called sub-blocks) is nested within the first system (called blocks). These designs have been developed to take care of the heterogeneity in the experimental units or the experimental conditions caused by two factors (one factor is nested within the other factor). A nested block design with sub-block size 2 can also be used for obtaining efficient designs for diallel crosses. Keeping in view the importance of these designs in agricultural experimentation, the combinatorial aspects of block designs have been investigated. An exhaustive review of methods of construction of nested balanced incomplete block (NBIB) designs has been made. Some new methods of construction of NBIB designs and nested balanced block (NBB) designs have been obtained. The catalogue of NBIB designs with v£16,r £ 30 has been updated by including the NBB designs. Some non-proper nested variance balanced block designs have also been obtained. New methods of construction of nested partially balanced incomplete block (NPBIB) designs have

been developed using NBIB designs, Latin square association scheme and rectangular association scheme. NPBIB designs with v£25,r £30 obtainable from existing and new methods of construction have been catalogued. Some nested block designs that are variance balanced with respect to block classification and partially balanced with respect to sub-block classification have also been obtained. The concept of nested balanced treatment incomplete block (NBTIB) designs has been introduced to deal with the experimental situations where the experimenter is interested in comparing several test treatments with a control treatment. Several methods of construction of NBTIB designs have been obtained. NBTIB designs with v£25,r £30 obtainable from these methods of construction have been catalogued.

(Guide: Dr. Rajender Parsad)

(c) M Sc.(Computer Application)

1. G.V.V.Shyamla Jyoti - Automation of Circulation Control System in the Library

The library serves as a centre for arousing and simulating intellectual curiosity and thus satiating the desire to learn by offering reading materials and bibliographic searches to satisfy the quest for knowledge. Circulation Control concerns the record keeping of books and other literature issued to users and what has been returned by them. It also helps in checking pilferage and losses and in promptly locating which of the documents stand with whom and when it is due. To manage such information manually is not only tiring and time consuming, but difficult to manage correctly. Thus the circulation section of a Library is very important as it controls and regulates the entries and exits to the library. Keeping the soul aspect of Circulation Control of a Library in mind, CIRCOSYS (Circulation Control System) is developed as the Intranet solution for the smooth running of Circulation activities of a Library. CIRCOSYS brings the Circulation Control System on the web and overcomes the limitations of the manual system. That is, it helps manage circulation of materials more rapidly, more accurately and less expensively. CIRCOSYS keeps a record of all the books available in the Library and to whom they are issued currently. When an item is overdue it sends reminders through e-mail automatically. Besides this, it also collects some useful statistics about the system. CIRCOSYS is developed using Java Server Pages (server side programming) and JDBC (Java Database Connectivity), which makes it platform independent. The client side programming is done using HTML and Java Script. It is divided into three separate modules for End User, Circulation Assistant and Administrator. Depending on the user type they will have pre-assigned privileges.

(Guide: Dr.S.D.Sharma)

2. Nguyen The Cuong - Information System on Agronomic Practices for Wet Seeded Rice in Cantho-Vietnam

The dynamic of agricultural systems include complex biological, social and economic processes. Future possibilities are affected by many different factors that influence their biological and economic efficiency. Successful management of these systems can be facilitated by a

proper tool to support rational decisions. Such a tool should follow the logic of the decision making process, and include the capacity to support management activities.

The purpose of present study was to develop a web-based "Information system on agronomic practices for wet-seeded rice in Cantho province - Vietnam" (ISAPWER), which would help the users to be more informed about decisions related to rice production in the region. The ISAPWER contains the information of agronomic practice on wet-seeded rice in the form of text and pictures on agronomic aspects from the land preparation up to post-production activities.

The ISAPWER is developed using the concepts of web-based client-server 3rd tier model. The user interface layer is constructed using HTML and JavaScript. The application layer is implemented in Java Server Pages and JDBC. The database layer is built in Microsoft Access 2000. The ISAPWER can run at any computer that connects to the Internet through the Java-enabled browser.

The ISAPWER, with a user-friendly interface, allows any user who has access to the Internet to quickly get the desired information. It can be implemented as a web application, which allows simultaneous access to many users. There is a provision to insert, delete and update the information at the remote computer. The ISAPWER was developed in response to the recognition that many farmers do not have access to information on how to grow the rice. Information technology offers new ways to present information to these farmers through present package

(Guide:Dr.I.C.Sethi)

3. Preeti Tanwar - Web-based information system on infrastructural facilities available in NARS.

An information system related to various Infrastructural facilities available in NARS has been developed. Various General and Specific Reports are generated with the complete description of facilities. Reports in the software emphasize list of Labs, Divisions, Veterinary Hospitals, Library, Lecture Rooms, Hostels, Central Instrument Labs, Vehicles etc in various Institutes and Some Reports are generated according to the user options like various divisions in selected Institute, Facility description after selecting division even if Institute is not known, list of all Institutes after selection of type of facility, Description all existing Infrastructural facilities after selection of Institute. Database can accommodate any kind of facility, irrespective of its type. Help is also provided in the software so that the end user will have no problems in navigating the system. Being web based, it is made platform as well as server independent. It could act as comprehensive Information directory for the end users & also for the Administrators in managing huge databases of Infrastructural facilities available in NARS.

(Guide:Dr.R.C.Goyal)

4. Ratan Jyoti - Development of Information System for the National Pusa Insect Collection

The National Pusa Insect Collection (NPIC) is one of the biggest insect collections in Asia. This insect store house comprises of a space of more than 6000 sq. ft. area, 200 dust

proof insect cabinets and 150 insect almirahs and has a collection of more than 2 lakhs specimens comprising of around 17000 identified species, some of which are more than a hundred years old. New specimens are being added regularly. Collections are important not only for research, bio-diversity studies and variation but also serve as reference material for the species. A systematic collection always provides many ways of diagnosis which opens the way to new classification. Searching from this large database is time consuming and tedious job often resulting damage to the stored specimens. The frequent repeated handling of these fragile and nearly extinct specimens requires computerization of NPIC.

The present investigation was carried out with the idea of developing web based Information System for National Pusa Insect Collection (ISNPIC). ISNPIC provides information on various aspects of insects. The information is provided in the form of text as well as pictures. ISNPIC is a best possible approach for Insect identification Service. A person with little computer knowledge can operate and get desired information. It also provides information on Insects, NPIC and Indian Agricultural Research Institute.

It has a three-layered architecture. Client Side Interface Layer is implemented in HTML and JavaScript. Server Side Application Layer is implemented in Java Server Pages and Java Database Connectivity. Database Layer is implemented in Microsoft Access 2000. ISNPIC can be implemented as a network-based system with a server at NPIC so that information is available on-line. ISNPIC runs at any node of the Internet through a browser. Security features are provided in such a way that only administrator can access the database. There is provision to insert, update and delete the information. It has facility to browse and search the collection in the NPIC. It is possible to get enlarged view of the image of insect specimen in the NPIC for making comparison with the specimen available with the user. It has on-line help to facilitate smooth navigation. Facility has been provided for interaction with the System Administrator of NPIC through email. Links are also provided for information on insects that is currently available on Internet.

(Guide:Dr.P.K.Malhotra)

5. Ruby Susana Kujur - Development of Software for Agricultural Discussion Forum

The recent advances in computer and communication technology have made computer hardware and software more affordable and user-friendly and have resulted in faster movement of information and its utilization. Information systems are assuming an ever-increasing importance in the agricultural development and computer based information systems/databases and computer communication networks are today and in the foreseeable future, a pre-requisite for taking coherent and balanced decisions. Agricultural Discussion Forum (ADF) is one such step in this direction. Discussion Forum is an informal forum where people discuss issues of their interest with no fixed agenda except trying to provide solutions for some specific problems. Keeping in view the requirements of the users, the Agricultural Discussion Forum has been

developed and is a feasible Internet solution. It has provision for reliable data and information and also for future research.

(Guide:Dr.R.C.Goyal)

6 *Vikas Kumar - Development of Search Engine for Agriculture Community*

The present era has seen an exponential growth and diversification of all forms of information, which is sometimes called as information explosion. This has been made possible due to the impact of computer technology on the present society. Today the Word Wide Web grows by roughly a million electronic pages, adding to the hundreds of millions already on-line. This volume of information is loosely held together by more than a billion annotated connections, called links. For the first time in the history, millions of users have virtually instant access from their home and offices to creative output of a significant and growing fraction of the world's population. Any user connecting to a web site will just get an electronic copy of the part of the document one is interested in. Simultaneously any number of other users can also get this document. This definitely is a major landmark in the evolution of the manner of sharing knowledge.

Due to the web's rapid growth, the resulting network of the information lacks organization and structure. In fact, the Web has involved into a global mess of previously unimagined proportions. Individuals with any background, education, culture, interest and motivation can write web pages in any language, dialect or style. Each page may range from a few characters to a few hundred thousand pages. The extraction of relevant information in response to a specific need from this digital mass has become a challenge. The main tool that has emerged for getting at the information in this environment is the Search Engine.

A number of Search Engine software have been developed but most of searching software are coded as a legacy code of 'c' or in 'c++', which make them platform dependent and difficult to incorporate with web server, because it require special configuration of server.

The agriculture is a specialized field and information related to this is present on specific sites, generally institutional site, state sponsored sites or agricultural industry sites. For the information requirement of Agriculture related fields, searching on these sites will be more relevant than searching on whole Internet. In Agriculture sector particularly in India not much effort has been made to develop and deploy a search engine, which may serve the vast agriculture community. Most people with Web sites are customers of commercial Internet providers and they use commercial search engines. So there is a need to develop a web-based agricultural search engine.

In the present investigation efforts has been made for developing software for a Search Engine using robust functionality of JAVA, simple and efficient algorithm of best search engine and a search engine that is suitable for small site or for intranet. AgriKhoj is developed for Internet purpose. It has a three-layered architecture. Client Side Interface Layer is implemented in HTML, JavaScript and Cascading Style Sheet

(CSS). Server Side Application Layer is implemented in Java Servlets & JDBC. Database Layer is implemented in Microsoft Access 2000. AgriKhoj can be implemented as a network-based system with a server. A person with little computer knowledge can operate and set it to work.

(Guide:Dr.R.C.Goyal)

PROJECTS

CHAPTER -11

LIST OF APPROVED ON-GOING PROJECTS

Sl. No.	Project title	Project leader and Associates
	Remote Sensing and Geographic Information System	
1.	Study of Land Use Statistics through integrated modelling using Geographic Information System (Funded through A.P. Cess Fund, ICAR)	Anil Rai AK Srivastava Randhir Singh HC Gupta VK Jain
2.	Development of GIS based techniques for identification of potential agro-forestry area	Tauqueer Ahmad Randhir Singh Anil Rai
	Assessment and Evaluation Studies	
3.	Assessment of harvest and post-harvest losses – a mission mode project under NATP	HVL Bathla Anil Rai RS Khatri Jagbir Singh Tauqueer Ahmad Girish Kumar Jha Vipin Kumar Dubey
4.	Sampling procedure for selection of representative sample of fertilizer from ship (Funded through A.P. Cess Fund, ICAR)	UC Sud HVL Bathla Anil Rai
5.	Study relating to formulating long term mechanisation strategy for each agro-climatic zone/state (Funded by Department of Agriculture and Cooperation, Ministry of Agriculture)	KK Tyagi HVL Bathla DL Ahuja MS Narang Satya Pal RM Sood

		Bhagwan Dass SC Agarwal AK Gupta KK Kher DC Mathur RC Gola Man Singh
Production and Area Estimation		
6.	Estimation of wool production – emerging data needs and a methodological reappraisal (Funded through A.P. Cess Fund, ICAR)	RS Khatri JP Goyal J. Jayasankar (CSWRI, Avikanagar) V. Geethalakshmi (CSWRI, Avikanagar)
7.	A study for estimation of crop yield at block level using crop cut and farmers' estimate (Funded through A.P. Cess Fund, ICAR	UC Sud AK Srivastava HVL Bathla DC Mathur GK Jha
Cost of Production Studies		
8.	A pilot study on cost of production of coconut in Kerala (Funded from Coconut Development Board, Kochi, Kerala)	UC Sud HVL Bathla Jagbir Singh DC Mathur KK Kher GK Jha K. Murlidharan (CPCRI, Kasaragod)
Cropping Systems Research		
9.	Planning, designing and analysis of experiments planned on stations under the Project Directorate of Cropping Systems Research	Rajinder Kaur Ajit Kaur Bhatia Anil Kumar (Since August 2001)
10.	Planning, Designing and Analysis of 'On Farm Research Experiments' planned under Project Directorate of Cropping Systems Research	N.K. Sharma P.K. Batra Mahesh Kumar (Retired on July 2001)

11.	Planning, designing and analysis of data relating to experiments conducted under AICRP on Long-Term Fertilizer Experiments	M.R. Vats D.K. Sehgal D.K. Mehta
12.	A statistical investigation on the long term effect of fertilizers on productivity of cereal crop sequences	V.K. Sharma Rajinder Kaur
13.	A diagnostic study of design and analysis of field experiments	Rajender Parsad V.K. Gupta P.K. Batra R. Srivastava Rajinder Kaur Ajit Kaur Bhatia Praween Arya
14.	Planning, designing and analysis of experiments relating to AICRP on STCR	Aloke Lahiri V.K. Sharma A. Subbarao (IISS, Bhopal) M. R. Vats D.K. Mehta Rajender Parsad
	Information System for Agricultural and Animal Experiments	
15.	Agricultural Field Experiments Information System	P.K. Batra O.P. Khanduri (on leave) D.C. Pant G.L. Khurana
	Experimental Design for Agricultural, Animal, Agroforestry and Fisheries Research	
16.	Designs for fitting response surfaces in Agricultural Experiments (Funded through AP Cess Fund, ICAR)	Rajender Parsad R. Srivastava P.K. Batra
17.	Statistical investigation on the fertilizer use efficiency in relation to cultural practices	Rajendra Kumar J.K. Kapoor
18.	Three-associate class partially balanced incomplete block designs and their application in partial diallel crosses	Cini Varghese V.K. Sharma Seema Jaggi Saurabh Prakash
19.	Design and analysis of agro-forestry experiments	D. P. Handa Seema Jaggi V.K. Sharma

		A.S. Gill (IGFRI, Jhansi)
20.	Design and Analysis of on Station and on Farm Agricultural Research Experiments: A Revisit (Funded through AP Cess Fund, ICAR)	A.K.Nigam (IASDS, Lucknow) Rajender Parsad V.K.Gupta
21.	Statistical study on competition effects among neighbouring units in field experiments (Funded through A.P. Cess Fund, ICAR)	Seema Jaggi V.K. Gupta
Computer Simulation Studies and Applications of Re-Sampling Techniques Like Bootstraps, Jackknife, Balanced Repeated Replications in Agricultural Statistics		
22.	Development of statistical procedures for selecting genotypes simultaneously for yield and stability.	A.R.Rao V.T.Prabhakaran A. K. Singh
23.	Studies on data processing techniques for statistical analysis of large field variability in hilly and salt affected soil regions (CGP, NATP)	V. K. Bhatia Rajender Parsad
Studies on Gene Action, Estimation of Genetic Parameters and Genetic Merit, Genetic Progress and Other Related Statistical Methods		
24.	On some robust estimation of heritability.	V.K. Bhatia A.K.Paul
25.	Empirical investigations on the influence of fixed effects on the estimates of heritability.	S.D.Wahi A.R.Rao Lal Chand
26.	Studies on growth pattern and heritability of fitness traits in Indian breeds of goats.	Lal Chand V.K. Bhatia Shri S.D.Wahi
Non-linear statistical modelling of biological, ecological and economic phenomena		
27.	Study of non-linear time series modelling in agriculture	Himadri Ghosh Prajneshu A. K. Paul
Forecasting Techniques in Agricultural System		
28.	Development of early warning and	Asha Saksena

	yield assessment models for rainfed crops based on agro-meteorological indices.	R.C.Jain (Retired on 30.11.99) R.L.Yadav, (Dte. Of CSR, Modipuram Meerut)
29.	Forecasting the loss in yield due to weeds.	Madan Mohan Ranbir Sharma (IARI, New Delhi) T.Rai Ranjana Agrawal
30.	Forecasting of fish production from ponds	L.M.Bhar, S.S. Walia, A.K.Roy (CIFA, Bhubaneshwar)
31.	Pilot study on forecasting of brood-lac yield from Butea monosperma (Palas) (Funded through A.P. Cess Fund, ICAR)	A.K. Jaiswal (ILRI, Ranchi) K.K. Sharma (ILRI, Ranchi) Chandrahas
32.	Studies on bio-ecology and population dynamics of major pests of mango (hoppers, fruit fly, leaf webber and inflorescence midge) and guava (fruit borer).	R.P.Shukla (CISH, Lucknow) S.C. Mehta Shashi Sharma (CISH, Lucknow)
33.	Development of model for forewarning about infestation of the insects of paddy crop.	M.K. Sharma (NDUAT, Faizabad) V. Pandey (NDUAT, Faizabad) R.S.Singh (NDUAT, Faizabad) Ramasubramanian V. S.S. Walia
34.	Epidemiology and forecasting of powdery mildew and Anthracnose.	A.K.Misra (CISH, Lucknow) Om Prakash (CISH, Lucknow) Ramasubramanian V.
35.	Forecasting sugarcane yields using Multiple Markov Chains.	Ramasubramanian V. Ranjana Agrawal L.M. Bhar

36.	Development of weather based forewarning system for crop pests and diseases. (Mission Mode project under NATP. Lead centre CRIDA).	Ranjana Agrawal S.C.Mehta L.M.Bhar Amrender Kumar
Study of Technological Change, Risk and Uncertainty in Agriculture		
37.	An econometric study of technological dualism in egg production	S.P. Bhardwaj R.K. Pandey Sushila Kaul Wasi Alam R.N. Malik
38.	Technical efficiency analysis of rice-wheat system in Punjab (Funded through A.P. Cess Fund, ICAR)	S.S. Kutaula
Study on Food Security		
39.	Jai-Vigyan national science and technology project on household food and nutritional security for Tribal, Backward and Hilly Areas (Mission Mode NATP)	R.K. Pandey Sushila Kaul Dharam Raj Singh
Modelling for Agricultural Marketing		
40.	Study of lac marketing in India (Funded through A.P. Cess Fund, ICAR)	S.P. Bhardwaj V.K. Bhatia Sushila Kaul Sanjeev Panwar R. Ramani (ILRI, Ranchi)
Development of Databases and Information System for National Agricultural Research System		
41.	Institutionalisation of research priority setting, monitoring and evaluation and networking of social scientists (NATP, PME project under O&M component)	S.D. Sharma P.K. Malhotra R.C. Goyal V.H. Gupta Sanjeev Kumar Sudeep Kumar Sangeeta Ahuja Saurabh Prakash Ashok Mittal
42.	Integrated National Agricultural Resources Information System (INARIS) (Mission Mode NATP)	Anil Rai PK Malhotra Randhir Singh M.S. Narang

		T. Ahmed Prachi Mishra V.K. Jain P.K. Batra S.P. Bhardwaj V. Ramasubramanian A.R. Rao Sudeep Kumar Sonali Das Vipin Kumar Dubey Alka Arora Anshu Dixit K.K. Chaturvedi
43.	Development of expert system of extension. (CGP, NATP)	Ram Bahal, (IARI, New Delhi) Sudeep Kumar
44.	Network of social scientists	Rajni Jain, (NCAP, New Delhi) Alka Arora
45.	Development of software for online information on personnel management in ICAR system.	Balbir Singh Alka Arora Samir Farooqi Shashi Dahiya
	Revolving Fund Scheme	
46.	Short term training programs in Information Technology (Funded through ICAR RFS)	S.D. Sharma V.K. Mahajan
	Program under Centre of Advanced Studies in Agricultural Statistics and Computer Applications	
47.	National Information System on Agricultural Education on Internet (NISAGENET)	R.C. Goyal V.H. Gupta Vipin Dubey Pal Singh
	Others	
48.	Information support for management of agriculture – State of Indian Farmers – A Millennium Study (Funded through IIM, Ahmedabad)	S.D. Sharma A.K. Srivastava

CONSULTANCY

CHAPTER -12

CONSULTANCY, PATENTS, COMMERCIALISATION OF TECHNOLOGY

- Provided technical guidance to Board of Revenue, Ajmer (Rajasthan) under centrally sponsored scheme on "Crop estimation surveys on fruits, vegetables and Minor Crops".
- Provided guidance to Sh. R.K. Arora and his SRF in field data collection of CSWRI Centre at Bikaner in connection with the Mission Mode NATP project entitled "Assessment of harvest and post-harvest losses".

Advisory Services Provided:

- Dr. S.S. Singh, Senior Scientist, Division of Genetics, IARI, New Delhi was advised on the analysis of data pertaining to an experiment conducted using a RCB design with 28 treatments (25 tests and 3 controls). Contrasts analysis was performed on the data to compare the test treatments among themselves, control treatments among themselves and test vs. control treatments.
- Sh. M.Daryaei, Ph.D. student of Division of Environmental Sciences of IARI, New Delhi has been advised on the analysis of data pertaining to an experiment conducted to quantify the yield losses due to multiple pests (disease, insects and weed) in Rice and wheat. The experiment was conducted using 15 treatments with three replications using a RCB design. Due to the natural occurrence of pests, the distinct treatments were only 12. Therefore, the analysis of orthogonal block designs where three of the treatments are replicated twice and some are replicated once in each of the blocks was suggested.
- Sh. Sunil Mahajan, A student of Division of Seed Science and Technology, IARI, New Delhi was advised on the analysis of data pertaining to the experiments conducted for testing the storability of seed treated with 10 different chemicals under different storage conditions viz. controlled conditions (15^0 C and 30 % relative humidity) and ambient conditions. A part of the seed is taken out and responses were observed. It has been suggested that the period may be taken as artificially created environments and data may be analysed as per procedure of groups of experiments.

- A student of Division of Biotechnology, IARI, New Delhi was advised on the analysis of data pertaining to the experiment conducted for testing the efficacy of various plant growth regulator in inducing regeneration in various explants. The parameters taken were % explants responded and number of merismetic loci involved/ explant. Basically one-way classified ANOVA, Arcsine transformation and Duncan's multiple range test were suggested.
- Sh. Dhiraj Singh, M. Sc. Student of Division of Agronomy, IARI, New Delhi was advised on the analysis of data pertaining to an experiment conducted to study
- Shri RN Yadav, Ph.D. Student was advised to conduct experiment at IARI Regional Station, Karnal for pollination studies under different environments and population geometry in Sunflower Hybrid Seed production. There were three planting ratios and three environments (date of sowing) and three planting designs (separate rows of male and female, mixed rows of males and females and blocks of males within females). The planting ratios were required to be isolated to avoid contamination in pollination due to bees. Therefore, the experiment was conducted at three isolated places and since date of sowing also has an effect on pollination, therefore this experiment was considered as nine different experiments which were tested for homogeneity of error variances and then the procedure of groups of experiments was followed for the analysis.
- Dr. A.K. Singh, Project Director, Water Technology Centre IARI, New Delhi was advised on the analysis of singly replicated factorial experiments. The experiment was related to study the effect of irrigation, nitrogen, depth, classes of soil aggregates on organic carbon in rice-wheat cropping system.
- The Institute has developed and implemented Expert Management Information System (EMIS) for ASRB and provided technical guidance for the conduct of ARS/ SRF/NET Exam.
- Dr. R.C.Goyal Provided consultancy for the development of an Information System on Indigenous Technical Knowledge (ITK) at Directorate of Extension Services, JNKVV, Jabalpur under an NATP-Mission Mode Project on Collection, Documentation and Validation of Indigenous Technical Knowledge.

MEETINGS

CHAPTER -13

QRT, RAC, MANAGEMENT COMMITTEE, SRC, ETC. MEETINGS WITH SIGNIFICANT DECISIONS

Quinquennial Review Team (QRT)

The Director General, ICAR has constituted a Quinquennial Review Team (QRT) to review the work done by the Indian Agricultural Statistics Research Institute, New Delhi for the period 1996-2000. the composition of the QRT is as given below:

1.	Dr. Padam Singh, Additional Director General, Indian Council of Medical Research and Chairman, QRT Ansari Nagar, New Delhi – 110 029.	Chairman
2.	Dr. SN Mishra, Society for Economic & Social Research, J.R. Complex No. 2, HCMR Farms, Village – Mandoli, Delhi – 110093.	Member
3.	Sh. DK Trehan, Economic & Statistical Advisor, Directorate of Economic & Statistics, Ministry of Agriculture, Krishi Bhawan, New Delhi – 110 001	Member
4.	Dr. G. Nageswara Rao, Former Professor, Deptt. of Statistics, ANGRAU, 3-4-63/19/J, Krishna Sai, Shri Ramana Puram Uppal P.O., Hyderabad – 500039 (A.P.)	Member
5.	Shri M. Moni, Deputy Director General, National Informatics Centre, CGO Complex, A-Block, Lodhi Road, New Delhi – 110 003.	Member
6.	Dr. AC Kulshreshtha, Deputy Director General, Ministry of Statistics & Programme Implementation, Central Statistical Organisation, Sardar Patel Bhavan, Sansad Marg, New Delhi – 110 001.	Member
7.	Dr. AK Srivastava, Joint Director, I.A.S.R.I., New Delhi-110012	Member-Secretary

The QRT initiated its work with a preliminary and planning meeting on 18 October,2001. The meeting was attended by all the QRT members and Dr. Anwar Alam, DDG (Engg.), ICAR, Dr. J P Mishra, ADG (ESM), ICAR and Dr. S.D. Sharma, Director of the Institute. A work plan to review, consultations, meetings, visits, writing and finalisation of the report was discussed. As a preliminary requirement, a document prepared by the Institute consisting of background information regarding the Institute was provided to each member of the QRT. It was planned that in subsequent meetings, interaction/ feedback should be carried out with Research Advisory Council (RAC), Management Committee (MC), Staff Research Council (SRC), Divisional Research Committee (DRC), interaction with scientists, other mandatory bodies within the Institute like Institute Joint Staff Council (IJSC), Grievance Cell etc.

As a follow up, a meeting was held on November 10, 2001 between QRT Chairman and Prof. V.R. Rao who was the Chairman of the Research Advisory Council of the Institute from October, 1998 to September, 2001. In this meeting, Prof. Rao apprised the QRT Chairman about the functioning of RAC and its role in providing an overall direction towards the research priorities of the Institute.

Subsequent meetings were held on November 12-13, 2001 with Heads of Divisions of the Institute to discuss the research achievements in representative Divisions. It was felt that the research achievements should be evaluated vis a vis the mandate of the Institute. As such a feed back was taken from each Division on the basis of various activities of Scientists.

The next QRT meetings were held on December 6-7, 2001. During this period, QRT members had meetings with SRC (in which all the scientists of the Institute were present), DRC's (in which the QRT members met in groups with scientist of different Division), Management Committee, Institute Joint Staff Council (IJSC) and Grievance Cell. Discussions were also held on individual projects of the Institute, particularly on some of the important projects in the main thrust areas. In Division wise discussions following QRT members interacted with various Divisions in meetings held on December 6-7, 2001.

Division	QRT Members
Design of Experiments & Biometrics	Dr. G. Nageswara Rao Dr. A.C. Kulshreshtha
Forecasting Techniques & Econometrics	Dr. S.N. Mishra Dr. A.K. Srivastava
Sample Survey	Dr. Padam Singh Dr. A.K. Srivastava
Computer Application	Sh. M. Moni

A meeting was held on March 13, 2002 in which QRT Chairman discussed projects undertaken in two important areas in Sample Survey Division *i.e.* Remote Sensing Application in Agriculture and study to formulating long-term mechanisation strategy for each agro-climatic zone/state.

Research Advisory Council (RAC)

The sixth meeting of the Research Advisory Committee of the Institute was held on September 24, 2001 under the chairmanship of Shri VR Rao, Former Director General, Central Statistical Organisation (CSO). The meeting was attended by Dr SD Sharma, Director; Dr JP Mishra, ADG(ESM), ICAR; Prof S Mohanty; Dr Ratan Mandal as members and Dr HVL Bathla, Head, Division of Sample Survey and Member-Secretary. Joint Director, All HDs, Professors, CAO and FAO also attended the meeting as special invitee. In the meeting the action taken on the recommendations made in the last meeting, all research programmes completed, ongoing, initiated, proposed, submitted for external funding, revolving fund scheme, NATP Projects, the training and teaching programmes organised and proposed and other important activities like Agricultural Research Data Book, the use of small area approach suggested under National Agricultural Insurance Scheme and preparation of a status paper for the millennium study – the status of the farmer were discussed at length. After detailed discussions, the following recommendations were emerged.

1. Separate provision of funds in selected projects should be kept for inviting experts from outside who may spend time in the Institute and work alongwith the scientists involved in the project.
2. The methodology evolved under AP Cess funded remote sensing project needs to be examined as to whether it has reached the stage that it can be passed on to the user organisations. Can this method be used for getting satisfactory estimators with lesser number of crop cutting experiments?
3. The conclusions drawn from the project entitled "Pilot study for developing Bayesian probability forecast model based on farmer appraisal data on wheat crop" are encouraging. Accordingly, a project should be prepared for large-scale adoption.
4. The report pertaining to the project entitled " Study of demand for agricultural products and its implementation for food security" should be widely circulated.
5. The methodology being used for estimation of fish catch from inland resources in the country should be reviewed.
6. As informed by the Chairman, the Central Statistical Organization has proposed to have a data warehouse. The Institute should also have technical involvement in such projects.
7. In new project proposed/undertaken in different ICAR Institutes/Ministry of Agriculture for development of techniques and statistical methods, the IASRI involvement/collaboration is necessary.
8. The National Statistical Commission has made certain recommendations pertaining to methodological studies. The Institute should collaborate with NSSO and other research Institutes in these studies.
9. The scheme entitled "Improvement of Crop Statistics" should be reviewed by a technical group involving scientists from IASRI.

The three year term of the RAC was upto October 22, 2001. Accordingly, the RAC of the Institute has been re-constituted as under by the Council for a period of three years w.e.f. October 23, 2001 except the membership of non-official members mentioned at Sl. No. 8 & 9 whose term will be upto March 19, 2004 and July 19, 2004.

1.	Dr NS Sastry, Former Director General, National Sample Survey Organisation, 272, Sector – 19, Pocket – C, Rohini, New Delhi-110085	Chairman
2.	Dr N Vijayaditya, Director General, National Informatics Centre, A-Block, CGO Complex, New Delhi-110003	Member
3.	Dr Prem Narain, Ex-Director, IASRI B-3/27A, Lawrence Road, Keshav Puram, Delhi-110035	Member
4.	Dr Lal Chand, Former Professor (Statistics), JNKVV, C/0 Dr US Singh, S-1/44-Gillet Bazar,Varanasi (UP)	Member
5.	Sh DK Trehan, Economic and Statistical Advisor, Govt. of India, Directorate of Economics & Statistics, Deptt of Agril. & Cooperation, \Ministry of Agriculture, Krishi Bhavan, New Delhi-110001	Member
6.	Assistant Director General (ESM), ICAR, Krishi Bhavan, New Delhi-110001	Ex- officio Member
7.	Director, IASRI, New Delhi-110012	Ex-officio Member
8.	Dr Ratan Mandal Lecturer, Department of English TNB College, Bhagalpur (Bihar) (IMC Member)	Member
9.	Sh. Bipin Kumar Singh 7, Rajinder Nagar, Patna (Bihar) Or AT&P.O. Dumra, P.S. Maranchi via Hathidah District Patana, Bihar – 803301 (IMC Member)	Member
10.	Dr HVL Bathla, Principal Scientist & Head, Division of Sample Survey, IASRI, New Delhi-110012	Member-Secretary

Management Committee

The Director of the Institute, who is in-charge of the overall management of the Institute, is assisted in the discharge of his functions by the Management Committee of the Institute (constituted by the Council) by providing a broad-based platform for decision making process by periodically examining the progress of the Institute activities and by recommending suitable remedial measures for bottlenecks, if any.

The present Management Committee of the Institute consists as follows:

1.	Prof SD Sharma Director, IASRI	Chairman
2.	Director of Agriculture, Delhi Administration, Old Secretariat, NCT, Delhi	Member
3.	Director of Agriculture, Govt. of Uttar Pradesh, Lucknow	Member
4.	Director, Indian Agricultural Research Institute, New Delhi-110012	Member
5.	Dr AK Srivastava, Joint Director IASRI(ICAR), New Delhi-110012	Member
6.	Dr VK Gupta, Principal Scientist & Head (DE), IASRI(ICAR), New Delhi-110012	Member
7.	Sh RS Khatri, Senior Scientist IASRI(ICAR), New Delhi-110012	Member
8.	Dr HVL Bathla, Principal Scientist & HD (SS), IASRI(ICAR), New Delhi-110012	Member
9.	Asstt. Director General(ES&M), ICAR, Krishi Bhavan, New Delhi-110001	Member
10.	Sh Naveen Jain, Finance & Accounts Officers, ICAR Headquarters, Krishi Bhavan, New Delhi-110001	Member
11.	Sh Bipin Kumar Singh 7, Rajinder Nagar, Patna (Bihar)	Non-official Member

12.	Dr Ratan Mandal, Lecturer, Department of English, TNB College, Bhagalpur (Bihar)	Non-official Member
13.	Chief Administrative Officer IASRI, New Delhi-110012	Member-Secretary

The 43rd meeting of the Management Committee was held on April 20, 2001 under the Chairmanship of Prof. SD Sharma, Director. The following agenda items were discussed:

- Presentation of the Divisional activities by the Head, Division of Sample Survey & Head, Division of Forecasting Techniques
- Confirmation of proceedings of the 42nd meeting of the Management Committee held on July 20, 2000
- Review of action taken on the recommendations of the 42nd meeting of the Management Committee
- Consideration of proceedings of the Staff Research Council meeting held on January 30-30, 2001.
- Consideration of progress report of Revolving Fund Scheme for the year 1999-2000 and 2000-2001.
- Revised estimate for the year 2000-2001 and budget estimate for the year 2001-2002 in respect of Non-Plan (approved by the Council) and Plan (tentative)

The 44th meeting of the Management Committee was held on August 24, 2001 under the Chairmanship of Prof. SD Sharma, Director. The following agenda items were discussed:

- Confirmation of proceedings of the 43rd meeting of the Management Committee held on April 20, 2001.
- Review of action taken on the recommendations of the 43rd meeting of the Management Committee held on April 20, 2001.
- Consideration of proceedings of the Staff Research Council meeting held on August 01, 2001.
- Consideration of progress report of Revolving Fund Scheme for the period from April 01, 2001 to July 31, 2001.
- Consideration of the Institute's X Five Year Plan Programs, (01.04.2002 - 31.03.2007)
- Constitution of QRT and its guidelines – information thereof.
- Approval of the Re-constitution of the Grievance Committee of IASRI

The 45th meeting of the Management Committee was held on December 7, 2001 under the Chairmanship of Prof. SD Sharma, Director. The following agenda items were discussed:

- Confirmation of proceedings of the 44th meeting of the Management Committee held on August 24, 2001.
- Review of action taken on the recommendations of the 44th meeting of the Management Committee held on August 24, 2001.
- Condemnation of office jeep (5329)
- Consideration of progress report of Revolving Fund Scheme for the period from August 1, 2001 to November 30, 2001.

Staff Research Council

The Staff Research Council (SRC) of the Institute is an important forum to guide the scientists in the formulation of new research projects and to review the progress of on-going research

projects periodically. It also, monitors the follow up action on the recommendations of the Quinquennial Review Team (QRT) in respect of technical programmes of the Institute. Dr. SD Sharma, Director is the Chairman and Dr. D.K. Agarwal Principal Scientist In-Charge (RCMU) is the Member-Secretary of the SRC.

As per the guidelines of SRC, the new research project proposals were sent to the outside expert.

Two meetings of the Staff Research Council (SRC) were held during August 01, 2001 and February 15-16, 2002. In the first meeting 35 on going research projects were discussed. In the second meeting, 5 new projects were approved and review of progress of 35 research projects were discussed.

CHAPTER -14

PARTICIPATION OF SCIENTISTS IN CONFERENCES, MEETINGS, WORKSHOPS, SYMPOSIA, ETC. IN INDIA AND ABROAD

(A) Participation of Scientists in Conference/Workshop/Symposia, etc.

Sr. No.	Name of the Scientist	Programme	Venue	Period
1.	Dr Rajender Parsad	Fifth Agricultural Science Congress	Assam Agricultural University, Guwahati	Apr. 04-07, 2001
2.	Prof SD Sharma Dr AK Srivastava Dr HVL Bathla Dr Ranjana Agrawal Sh RS Khatri Dr Jagbir Singh Dr MS Narang Dr GK Jha	Launching/ interaction Workshop on Mission Mode NATP project entitled "Pilot study on assessment of harvest and post harvest losses"	IASRI, New Delhi	Apr. 11, 2001
3.	Prof SD Sharma Dr AK Srivastava Dr HVL Bathla Dr Randhir Singh Dr Ranjana Agarwal Dr MS Narang Sh VK Jain Ms Prachi Misra Dr Ramasubramanian V. Dr AR Rao	Launching/ interaction Workshop on Mission Mode NATP project entitled "Integrated National Agricultural Resources Information System" IASRI	(INARIS) New Delhi	Apr. 12, 2001
4.	Dr HVL Bathla	Confederation of Indian Industry (CII) National Conference on "Crossing the divide: Agriculture – Industry Partnerships"	Hotel Ashoka, New Delhi	Apr. 25, 2001
5.	Dr. R.K. Pandey Dr. Sushila Kaul	Annual Workshop of Jai Vigyan Project on "Household and Nutritional Food Security in	N.B.P.G.R., New Delhi	May 03-04, 2001

Sr. No.	Name of the Scientist	Programme	Venue	Period
		Tribal, Backward and Hilly areas.		
6.	Prof SD Sharma Dr Ranjana Agrawal	Workshop on Use of RS/GIS technique for mapping water resources for fishery sector	Ministry of Agriculture, New Delhi	May 09, 2001
7.	Dr RK Pandey Dr BC Saxena Dr KK Tyagi Sh RS Khatri Dr Jagbir Singh Sh JP Goyal Dr Sushila Kaul Dr T Ahmed	International Seminar on "Understanding Socio-Economic Changes Through National Surveys" in the Golden Jubilee Year Celebration of NSSO	Vigyan Bhawan, New Delhi	May 12-13, 2001
8.	Dr Ranjana Agrawal	Launching Workshop of NATP project entitled "Weather based forewarning system for crop pests and diseases"	CRIDA, Hyderabad	May 17 -19, 2001
9.	Prof SD Sharma	National Seminar on WTO, Trade Liberalization and Future of Indian Agriculture	PHD House, Siri Fort Road, New Delhi	May 25, 2001
10.	Sh RS Khatri	National Seminar on "WTO Trade Liberalization & Future of Indian Agriculture" organised by Farmer's Education & Welfare Society		May 28, 2001
11.	Prof SD Sharma Dr Randhir Singh Dr B.C. Saxena Dr K.K. Tyagi Dr D.L. Ahuja Dr UC Sud Dr Anil Rai Dr Jagbir Singh	National Workshop on "Improvement of Agricultural Statistics" organised by Directorate of Eco. & Stat., Deptt of Ag. and Coop., Min. of Agriculture, Govt. of India	Vigyan Bhawan, New Delhi	Jun. 13-14, 2001
12.	Ranjana Agrawal	Interaction Workshop of NATP Project entitled "Monitoring	VPKAS, Almora	Jun. 12, 2001

Sr. No.	Name of the Scientist	Programme	Venue	Period
		of diseases, insects and weeds of wheat, maize and rice crops"		
13.	Dr UC Sud	National Symposium on "Statistical Methods for plantation Crop Research"	Kayangulam Research Station of CPCRI	Jun. 19-20, 2001
14.	Dr Ramasubramanian V.	Requirement analysis Workshop of NATP project - INARIS	CPCRI, Kasargod	Jun. 29, 2001
15.	Dr. A.R. Rao Ms Prachi Misra	Requirement Analysis Workshop on Animal Genetic Resources of India under NATP Mission Mode project "INARIS"-	NBAGR, Karnal	Jun. 30, 2001
16.	Dr Ramasubramanian V.	Requirement analysis Workshop of NATP project - INARIS	IISR, Calicut	Jun. 30 – Jul. 02, 2001
17.	Dr RC Goyal	Review Workshop of the NATP- Mission Mode Project on Collection, Documentation and Validation of Indigenous Technical Knowledge (ITK)	Directorate of Extension Services, JNKVV, Jabalpur.	Jul. 10-12, 2001
18.	Dr Ramasubramanian V.	Requirement analysis Workshop under NATP Mission Mode Project - INARIS	CRIDA, Hyderabad	Jul. 12-13, 2001
19.	Dr T. Ahmad	Requirement Analysis Workshop under NATP Mission Mode project "INARIS"	IIHR, Bangalore	Jul. 28, 2001
20.	Dr HVL Bathla	Sensitization Workshop- cum-Interaction meet between the RPC members and PI's of approved sub-projects under EOE & MM	IASRI, New Delhi	Aug. 06, 2001

Name of the Scientist	Programme	Venue	Period
Ms Prachi Misra	Requirement Analysis Workshop under NATP Mission Mode project "INARIS"	PDCSR, Modipuram	Aug. 13-14, 2001
Prof SD Sharma Dr PK Malhotra Sh VK Jain Dr AR Rao	Requirement Analysis Workshop on Indian plant genetic resources information system under NATP Mission Mode project "INARIS"-	NBPGR, New Delhi	Aug. 16-17, 2001
Dr Randhir Singh	"Geometrica- Open House 2001" organised by PCI Canada and CDAC India	New Delhi	Aug. 20, 2001
Dr Randhir Singh Dr MS Narang Sh VK Jain	Requirement Analysis Workshop under NATP Mission Mode project "INARIS"	CIAE, Bhopal	Aug. 24-25, 2001
Dr RK Pandey Dr Randhir Singh Dr MS Narang Sh VK Jain	Requirement Analysis Workshop under NATP Mission Mode project "INARIS"	NCAP, New Delhi	Aug. 30-31, 2001
Sh VK Jain	Requirement Analysis Workshop under NATP Mission Mode project "INARIS"	NRC-AF, Jhansi	Sep. 04-06, 2001
Ms Alka Arora	Technology Seminar conducted by HCL	New Delhi	Sep.12, 2001
Prof SD Sharma Dr HVL Bathla Sh RS Khatri Dr Jagbir Singh Dr MS Narang Dr T Ahmad Dr GK Jha	1st Interaction Workshop of the Mission Mode NATP project " Assessment of Harvest and Post-Harvest Losses"	IASRI, New Delhi	Sep. 13-15, 2001
Dr Randhir Singh Dr AR Rao Ms Prachi Misra	Requirement Analysis Workshop on Fishery under NATP Mission Mode project "INARIS".	NBFGR, Lucknow	Sep. 26-27, 2001

Sr. No.	Name of the Scientist	Programme	Venue	Period
30.	Prof SD Sharma	National Conference for Rabi Campaign	Vigyan Bhavan, New Delhi	Sep. 27-28, 2001
31.	Prof SD Sharma Dr PK Malhotra Ms Alka Arora Sh Sudeep Ms Hem Lata	DOT NET seminar organised by Microsoft Corporation Ltd.	New Delhi	Oct. 12, 2001
32.	Sh Anil Kumar Sh Rajendra Kumar	National Symposium on Farming Systems Research in the New Millennium	PDCSR, Modipuram	Oct. 15-17 2001
33.	Prof SD Sharma Dr HVL Bathla Dr KK Tyagi Dr Jagbir Singh	Workshop for considering the survey design for collecting information on feed fodder consumption rates and related parameters pertaining to the project entitled "India's livestock feed balance and its environmental implications" organised jointly by NCAP, New Delhi and Society for Economic and Social Research	Mandoli, Delhi	Oct. 19, 2001
34.	Sh Sudeep	DOT NET seminar organised by Microsoft Corporation Ltd.	New Delhi	Oct. 19, 2001
35.	Prof SD Sharma	Dr. MS Swaminathan Research Foundation Seminar on preparing Atlas for food security for Urban Poor	Indian International Center, New Delhi	Oct. 31, 2001
36.	Prof. SD Sharma	2001 International Conference on the Development of Agricultural Information Management Technology and Markets in the 21st Century	CECAT, Beijing, China	Nov. 4-6, 2001

Name of the Scientist	Programme	Venue	Period
Dr AK Srivastava Dr VK Gupta, Dr PK Malhotra Dr HVL Bathla, Dr VK Sharma Dr Randhir Singh Dr Prajneshu Dr VK Bhatia Dr RC Goel Dr VK Mahajan Dr UC Sud Dr DK Agarwal Dr Anil Rai Dr Rajender Parsad	XIII National Conference of Agricultural Research Statisticians	Punjab Agricultural University, Ludhiana	Nov. 06-08, 2001
Dr VK Bhatia	Diamond Jubilee Symposium	IARI, New Delhi	Nov. 06- 09, 2001
Prof SD Sharma	Live-talk seminar by Microsoft India Pvt. Ltd.	Oberai Hotel, New Delhi	Nov. 12, 2001
Prof SD Sharma Dr HVL Bathla	National Horticulture Conference of Ministry of Agriculture	SCOPE, New Delhi	Nov. 16-17, 2001
Dr RK Pandey	Workshop on Network of Social Scientist in ICAR-SAUs System	NCAP, New Delhi	Nov. 20, 2001
Dr. R.K. Pandey Dr. Sushila Kaul	Ninth Annual Conference of Agricultural Economics Research Association of India"	IARI, New Delhi	Nov. 21-22, 2001
Prof SD Sharma Dr V.K. Sharma Dr P.K. Batra Dr Aloke Lahiri Dr Rajender Parsad Sh. H. Ghosh	IV Annual Conference of the Society of Statistics, Computer and Applications	Saurashtra University, Rajkot	Nov. 24-26 2001
Dr Randhir Singh	National Symposium on "Recent advances on remote sensing and GIS technologies for natural resources management"	CSRE, IIT, Bombay	Dec. 05-07, 2001
Dr UC Sud	National Congress Centenary of	IARI, New Delhi	Dec. 05-07, 2001

Sr. No.	Name of the Scientist	Programme	Venue	Period
		Nematology in India Division of Nematology,		
46.	Prof SD Sharma Dr HVL Bathla Dr KK Tyagi Dr UC Sud Sh RS Khatri Dr MS Narang Sh DC Mathur Sh VK Jain Sh SC Sethi	International FAO/SIAP Regional Workshop on "Economic Accounts for Agriculture"	IASRI, New Delhi	Dec. 10-15, 2001
47.	Dr. V.K. Bhatia	Workshop on Statistical and Computational Genomics	ISI, Kolkata	Dec. 11-13, 2001
48.	Dr. A.R. Rao	-do-	-do-	Dec.11-20, 2001.
49.	Sh Satya Pal Sh SC Agarwal Sh SC Sethi Sh RM Bhasin Sh AK Gupta Sh D.K. Sehgal Sh G.L. Khurana Sh D.K. Mehta Sh Anil Kumar Dr LM Bhar Dr Ramasubramanian V. Sh Amrender Kumar Sh Pal Singh Mohd. Sameer Farooqui Ms Shashi Dahiya Sh Shahnawajul Islam	Special Hindi Workshop for Scientists	IASRI, New Delhi	Dec. 20-22, 2001
50.	Prof SD Sharma	Directors' Conference of ICAR Institutes	NBPGR, New Delhi	`Dec. 27-28, 2001
51.	Dr V.K. Gupta Dr R. Srivastava Dr P.K. Batra Mrs Ajit Kaur Bhatia Dr Seema Jaggi Dr Rajender Parsad Dr Cini Varghese Sh H Ghosh Dr LM Bhar	International Conference on Design of Experiments: Recent Trends and Future Directions	Department of Statistics, University of Delhi, Delhi	Dec. 27-30 2001

Name of the Scientist	Programme	Venue	Period
Dr. R.K. Pandey	84th Annual Conference of Indian Economic Association	Indian Institute of Technology, Vellore (T.N.)	Dec. 28-30, 2001
Dr Prajneshu Dr Seema Jaggi	89th Indian Science Congress	University of Lucknow	Jan. 03-07, 2002
Prof SD Sharma	Workshop on Monitoring and Evaluation for local institution regarding PIMS training	IASRI, New Delhi	Jan. 03, 2002
Prof SD Sharma Dr HVL Bathla Dr Randhir Singh Dr MS Narang Sh VK Jain Dr RC Goyal Dr T. Ahmad Ms Prachi Misra Dr AR Rao	INARIS Workshop	IASRI, New Delhi	Jan. 08-10, 2002
Dr L.M. Bhar	National workshop cum training programme on Bio informatics and statistics in Aquaculture Research	CIFA, Bhubaneshwar	Jan. 08–11, 2002
Sh M.R. Vats	Workshop of AICRP on LTFE	BAU, Ranchi	Jan 14-16, 2002
Dr SD Sharma Dr AK Srivastava Dr HVL Bathla Dr Randhir Singh Dr KK Tyagi Dr Jagbir Singh Dr UC Sud Sh AK Gupta Dr V.K. Gupta Dr V.K. Sharma Dr VK Bhatia Dr R. Srivastava Sh SD Wahi Dr Aloke Lahiri Rajender Parsad Dr(Mrs.) Cini Varghese Dr. S.P. Bhardwaj Dr AR Rao	55th Annual Conference of Indian Society of Agricultural Statistics	Central Institute of Agricultural Engineering and Indian Institute of Soil Science Nabi Bagh, Berasia Road, Bhopal	Jan. 15-17, 2002

Sr. No.	Name of the Scientist	Programme	Venue	Period
	Sh H Ghosh Sh Sudeep			
59.	Dr Ranjana Agrawal	Review Workshop of the NATP project entitled "Development of weather based forewarning system for crop pests and diseases (cotton)".	CICR, Nagpur	Jan. 18, 2002
60.	Dr Anil Rai	GIS /Country Almanac Workshop/ Training program on Rice-Wheat Consortium for Indo Gangetic Plains	IIT, New Delhi	Jan. 22-26, 2002
61.	Sh Sudeep	International Workshop on REWIN-II	CIMMYT, India	Jan. 27-31, 2002
62.	Prof SD Sharma Dr. R.K. Pandey	Workshop on "Library Inter Connectivity within ICAR/SAUs Libraries"	IASRI, New Delhi	Jan. 30-31, 2002
63.	Dr Aloke Lahiri	National Workshop of AICRP on Soil Test Crop Response Correlation.	B.C.K.V.V. Kalyani, (W.B.)	Jan. 31- Feb. 02
64.	Dr Ranjana Agrawal	Regional seminar and group training on Monitoring and assessment of rice crop	ESCAP region at SAC, Ahmedabad	Feb. 02-Feb. 15,
65.	Sh KK Chaturvedi	Workshop on 'Codification of crop resources databases' of the project INARIS under NATP	IISR, Calicut	Feb. 05-06, 2002
66.	Dr Randhir Singh	Map India – 2002, the 5th Annual International Conference on GIS, GPS Aerial Photography and Remote Sensing	New Delhi	Feb. 06-08, 2002
67.	Sh RS Khatri	XXXI Dairy Industry Conference on	Nehru Centre, Worli, Mumbai	Feb. 07- 08, 2002

Name of the Scientist	Programme	Venue	Period
	"Marketing of milk & milk products – Challenges ahead"	(Maharashtra)	
Dr Randhir Singh Dr Ranjana Agarwal	ESCAP/ISRO regional Seminar and Group Training on Monitoring and Assessment of Rice Crop in the ESCAP Region	SAC, Ahmedabad	Feb. 12-15, 2002
Dr SS Srivastava	National workshop of CALIBER	Univ. of Rajasthan, Jaipur	Feb. 14-16, 2002
Prof SD Sharma	National Workshop for Comprehensive Scheme for Cost of Cultivation, organised by Directorate of Economics and Statistics	Vigyan Bhavan, New Delhi	Feb 21, 2002
Dr. D.R. Singh	National Symposium on Agriculture In Changing Global, Scenario	IARI, New Delhi	Feb .21-23 , 2002
Dr. S.P. Bhardwaj	15th Annual Conference of Agricultural Marketing organised by Indian Society of Agricultural Marketing	I.G.D.R., Mumbai	Feb. 24-26, 2002
Dr VK Bhatia	Workshop on CGP – NATP Peer Review Team	CCS Haryana Agricultural Uni., Hissar	Mar. 01-02, 2002
Dr Ranjana Agrawal Dr Seema Jaggi	Conference on Women Scientists and Technologists for National Development organised by Department of Bio-technology and Deptt. of Women and Child Development, Govt. of India	Vigyan Bhawan, New Delhi	Mar. 08-09, 2002
Sh Sudeep	Workshop of Expert System of Extension	IARI, New Delhi	Mar. 26-27, 2002

(B) Participation of Scientists in Training Programmes

Sr. No.	Name of the Scientist	Programme	Venue	Period
1.	Sh Sudeep Sh Vipin Dubey Sh KK Chaturvedi Sh S Islam	73rd Batch of Foundation Course on Agricultural Research Scientists	NAARM, Hyderabad	
2.	Sh Sanjeev Panwar Sh Prawin Arya Dr Ramasubramanian V	Summer School on "Quantitative Techniquein .Production Economic Research organised by Division of Econometrics, IASRI	IASRI, New Delhi	May 15 – Jun. 04, 2001
3.	Dr Anil Rai	3-day ICAR training programme on Intellectual, Proper Rights (IPR) and WTO	IARI New Delhi	Jun. 20-23, 2001
4.	Ms Cini Varghese	Training programme on Visual Basic Programming under RFS	IASRI, New Delhi	Jul. 16-28, ,2001
5.	Sh Sunil Dutt Sharma Sh Anil Kumar	Training programme on Development of Internet and Internet Using Linux operating system	CIRG, Makhdoom, Mathrua	Aug. 10-15, 2001
6.	Ms Anshu Dixit	Training programme on WEB Programming and Internet Technology under RFS	IASRI, New Delhi	Aug. 20-Sept.01, 2001
7.	Sh HK Samaddar	Taining course on Zero Bases Budgeting conducted by National Productivity Council	Mount Abu, Rajasthan Jaipur	Oct. 10-14, 2001
8.	Dr Ranjana Agrawal	Course on 'Gender and Development'	U.P. Academy of Administration, Nainital	Oct. 17 –24, 2001.
9.	Dr Randhir Singh	"Sr. Course on Stress Management" organised by NAARM, Hyderabad	NAARM, Hyderabad	Oct. 17-24, 2001
10.	Sh HS Sikarwar	Training programme on JAVA under RFS	IASRI, New Delhi	Oct. 29-Nov.10, 2001
11.	Ms Anshu Dixit	Training programme under the INARIS on Remote	National Remote	Nov. 19,2001 – Feb. 08, 2002

	Sensing Technology and its applications	Sensing Agency, Hyderabad	
Dr. R.K. Pandey	Network of Social Scientist in ICAR-SAUs System	NCAP, New Delhi	Nov 20, 2001
Ms Prachi Misra	DEMO on Remote Sensing Software ENVI	Ag. Physics Division, IARI, New Delhi	Nov. 21, 2001
Dr T. Ahmad Ms Cini Varghese	A training programme on "Biometric methods for agricultural research" under the aegis of CAS	IASRI, New Delhi	Nov. 22-Dec. 12, 2001
Dr PK Malhotra	Sensitization –cum-Training Workshop of Scientists of PME Cells in ICAR Institutes and SAUs	NCAP, New Delhi	Jan. 14-15, 2002
Shri Anil Agarwal	Training Course on Financial Management in Government conducted by Institute of Secretariat, Training & Management, Deptt. of Personnel & Training	New Delhi	Jan. 21- Feb. 01, 2002
Shri Sivaramane N.	Training Programme on C++ Programming conducted under Revolving Fund Scheme	IASRI, New Delhi	Jan. 21–Feb. 02, 2002
Dr GK Jha Sh Amrender Kumar Sh Pal Singh	Training programme on "Designing Vortals for NARS" organised by IASRI, New Delhi under the aegis of Centre of Advanced Studies in Agricultural Statistics and Computer Applications	IASRI, New Delhi	Feb. 06-26, 2002
Dr Randhir Singh Sh VK Jain Ms Prachi Misra	Training Programme entitled "Advanced Software Training covering RDBMS Concepts, Java 2, Networking & Oracle essentials, D2K, GIS and Spatial Data Management Concepts"	NIIT Ltd., New Delhi	Mar. 13- Apr. 12, 12, 2002

(C) Participation of the Institute in various meetings/discussions/functions, etc.

Related to National Agriculture Technology Projects

1. Review meeting of the NATP with World Bank Mid Term Review Mission-I at New Delhi on Apr. 11, 2001

2. Meeting with World Bank Review Mission Team led by Dr. Ashok Seth & Dr. PS Siddhu held at New Delhi to discuss ATR on previous Review Mission (Oct 2000) on Apr. 23, 2001

3. Meeting of M & E of ITD component of NATP under the chairmanship of Dr. Ashok Seth along with Dr Siddhu, Dr RP SIngh, Dr VV Sadamate, Dr GR Desai, Dr Rajashekharan at World Bank Office, New Delhi on May 02, 2001

4. Wrap-up meeting with NATP World Bank Review Mission Team Dr Ashok Seth & Dr Siddhu under the Chairmanship of Director General, ICAR & Secretary, DARE at New Delhi on May 03, 2001

5. Meeting for appointing a Developer for Central Data Base Management System (CDBMS), a data warehouse (DW) at Mumbai : Dr RB Barman, Sr. Executive, RBI in Chair, on May 19, Jun 09, Jun 16-17, 2001

6. NATP PMC meeting with Director General in Chair and presented PIMS at New Delhi on Jul. 20, 2001

7. First meeting of the National Steering Committee of NATP at New Delhi on Aug. 13, 2001

8. A meeting of the newly constituted PME (Prioritization, Monitoring and Evaluation) Task Force under NATP at New Delhi on Aug. 20, 2001

9. Meeting of the Scientific Advisory Panel (SAP) of Irrigated Agro-Ecosystem under NATP at Modipuram, Meerut on Aug. 23, 2001

10. A meeting on Library Information Services under Information System Development/NATP with DDG (Engg.) at New Delhi on Aug. 31, 2001

11. IV meeting of ITK Information Committee of the NATP Mission Mode project on “Collection, Documentation & Validation of Indigenous Technical Knowledge (ITK)” under the chairmanship of Dr. A. Alam, DDG (Engg.) for screening and clarifications of ITK’s received through voluntary disclosure at New Delhi on Aug. 31, 2001

12. Review meeting of the NATP with World Bank Mid Term Review Mission at New Delhi on Sep. 25, 2001

13. A Desk Review Meeting by World Bank Review Mission for O & M component M&E, PIMS at PIU

NATP, New Delhi on Sep. 28, 2001

14. A Sensitization meeting for monitoring & evaluation under PME of NATP followed by SAP (Arid Zone) at Jodhpur on Oct. 03, 2001

15. A meeting with Mr Johannes Keizer, (GILW) FAO, system & tools for managing documentation regarding project databases PIMS at New Delhi on Oct. 16, 2001.

16. A meeting with INARIS group to decide about the DW tools to be procured at New Delhi on Oct. 16, 2001

17. NATP Meeting regarding training feedback from NATP trainings at New Delhi on Oct. 23, 2001. The meeting was chaired by the Director.

18. Meeting with FAO Mission comprising of Dr. Stephan Rudgard and others on Information Support to Rural Livelihood, DFID, UK, especially regarding PIMS training on Nov. 21, 2001

19. The screening committee meeting for screening concept notes submitted under NATP CGPIII on Nov 21, 2001

20. A meeting with INARIS project of NATP as Mission leader to review the progress on Dec. 04, 2001

21. The review taken by the Director General regarding follow up Action on Aide Memoir of WB Supervision mission (Sept-Oct 01) at New Delhi on Dec. 05, 2001

22. Review meeting of the NATP project entitled “Monitoring of diseases, insects and weeds of wheat, maize and rice crops” at Dehradun on Dec. 10-11, 2001

23. Meeting with Dr. RK Gupta, Sr. Director, NIC regarding Data Warehousing at New Delhi on Dec. 18, 2001

24. Project Management Committee meeting NATP projects chaired by Director General on Dec. 24, 2001

25. Meeting with National Director, NATP regarding the strengthening of Library Information System on Jan. 7, 2002

26. 19th meeting of the RPC of the NATP at New Delhi on Jan. 18-19, 2002

27. SITE Committee meeting for reviewing NATP projects at New Delhi on Feb. 02, 2002. The meeting was chaired by the Director.

28. ITK Information Committee meeting under the Chairmanship of DDG (Engg.) at New Delhi on Feb. 08, 2002

29. Meeting for Library Information System Development with National Director, NATP in chair on Feb. 12, 2002

30. Review Meeting of NATP project entitled "Development of weather based forewarning system for crop pests and diseases" for the crops: Groundnut at Hyderabad on Feb. 16, 2002

31. Meeting of sub-committee to finalize investment plan for Library Information System Development & ISD with National Director, NATP and others on Feb 19, 2002

32. 13th Meeting of the PME Task Force of the NATP at New Delhi on Feb. 21, 2002

33. Review Meeting of NATP project entitled "Development of weather based forewarning system for crop pests and diseases" for the crops: Mustard at NRCRM, Bharatpur on Feb. 27, 2002

34. Review meeting of the NATP with World Bank Mid Term Review Mission- II at New Delhi on Mar. 05, 2002

Related to Agricultural Statistics Systems

1. 7th Meeting of National Statistical Commission subgroup on Agricultural Statistics to discuss Statistics of Agricultural Inputs, Area under mixed crops, index numbers & food balance sheets, work of expert group on ICS & rationalization of village records etc. held at New Delhi on Apr. 04, 2001

2. Two meetings of the Technical Committee of Direction (TCD) for Improvement of Animal Husbandry & Dairying Statistics organised by Department of Animal Husbandry & Dairying, Min. of Agriculture, Govt. of India under the Co-chairmanship of Director at New Delhi during Apr. 9-10, 2001 and Feb. 19-20, 2002.

3. Meetings of the working group on agricultural statistics for formulation of the Tenth Five Year Plan held at New Delhi on Apr. 18, Apr. 27, May 04, May 23 and Jun. 19, 2001

4. Meetings of Tenth Plan XIV subgroup on Livestock Statistics especially methodological issues in Integrated Sample Surveys at New Delhi on Apr. 16, May 04, May 16 and May 23, 2001

5. Meeting/demonstration to discuss use of Remote Sensing and GIS for the fisheries sector at New Delhi on May 09, 2001

6. Project Management Committee (PMC) meeting of the project entitled "Study relating to formulating long term mechanisation strategy for each agro-climatic zone/state", at New Delhi on May 16, 2001 and Feb. 11, 2002 respectively. The meeting was chaired by Director, IASRI.

7. Meeting of the Scientific Advisory Panel meeting for Agricultural Engineering Chaired by DDG (Engg.) for considering AP Cess funded projects at New Delhi on May 28-29, 2001.

8. Meeting with Hon'ble Minister of State Agriculture Shri Pad Naik and Dr Shalini Rajneesh PS MOS Ag. Shri Paul Joseph JS, Shri Dohre, Addl. Commissioner in Minister's Office chamber to discuss progress of study for formulating long term mechanization strategy for State/Agro-eco zones in the country on May 29, 2001. The meeting was chaired by the Director, IASRI.

9. Meeting for National Agricultural Insurance Scheme (NAIS) at New Delhi with Mr. Bhuria, Joint Secretary (Credit) on Jun. 20, 2001

10. Meeting regarding selection of software development/consultancy firm for modification of ARFIS software to Web-based ARFIS software : under the chairmanship of DDG (Engg.) at New Delhi on Jul. 03, 2001

11. Third meeting of steering group on Agriculture and Allied Sectors, chaired by Dr. MS Swaminathan at Yojana Bhavan, New Delhi on Jul. 09, 2001

12. UP High Level Coordination Committee (HLCC) meeting for improvement of Agricultural Statistics Chaired by Shri Ajay Prakash Verma, Agricultural Production Commissioner UP at Lucknow on Jul. 11, 2001

13. Meeting with Dr. Prem Vashist, Director, Agro Economic Research Centre, University of Delhi, Delhi regarding Cost of Cultivation Studies on Jul. 17, 2001

14. Executive Council meeting of Farming System Research and Development Association at Modipuram, Meerut, Aug. 09, 2001

15. Haryana High Level Coordination Committee (HLCC) meeting for Agricultural Statistics under the Chairmanship of Shri Naseem Ahmad, Principal Financial Commissioner & Principal Secretary Agriculture, Haryana at Chandigarh on Aug. 14, 2001.

16. Presentation cum meeting with Dr KR Satyamurthi, Advisor (Stat.) regarding integration of livestock census and agricultural census on Aug. 22, 2001. Livestock group form Sampling Division was present.

17. First meeting of the Steering Committee for Agricultural Census 2000-01 and Input Survey 2001-02, chaired by Shri Hemendra Kumar, Special Secretary (A & C) at New Delhi on Sep. 25, 2001

18. Group meeting of AICRP on Cropping System, Agricultural Research Station, Karamana, Thiruvananthapuram on Nov. 23-24, 2001

19. Meeting regarding the plan scheme on strengthening on data base and information networking for the fishery sector and the methodology of collection of fisheries statistics in the country under the Chairmanship of Jt. Secretary (Fisheries) at New Delhi on Jan 09, 2002

20. Agricultural Engg. SMD meeting to chalk out strategy for X Plan finalization and starting centers of Institutes on Feb. 28 and Mar. 01, 2002

21. Meeting regarding the project entitled “A pilot study on cost of production of Coconut in Kerala” with the experts from KAU, CDB & CPCRI at CPCRI, Kasargod on Mar. 22, 2002

Related to Teaching Activities

1. Emergent meeting of the Faculty of Mathematical Sciences, Delhi University on May 30, 2001

2. Meeting of the Board of Studies in the discipline of Agricultural Statistics on May 17, and for allotment of courses on Jun 28, 2001.

3. Director acted as a Chief Guest for a talk on e-Agriculture and GIS at PG School, New Delhi on Jun.

22, 2001

4. Meeting of the Board of Studies in the discipline of Computer Application for Allotment of Courses 2001-02 on July 3, 2001

5. Meeting of the Academic Council, PG School, IARI, New Delhi on Jul. 19, 2001

6. 352nd Academic Council Meeting of PG School IARI for M.Sc./Ph.D. result approval on Jul. 19, 2001

7. Board of Study meeting in agricultural statistics for guide allotment on Aug. 27, 2001

8. Directors' meeting for center of Advanced Studies of Education Division of ICAR at New Delhi during Aug. 30-31, 2001 and presentes the Annual Report for CAS in Agricultural Statistics and Computer Applications.

9. Board of Studies meeting in computer applications for guide allotment on Sept. 04, 2001

10. 353rd Meeting of the Academic Council of IARI pn Nov. 08, 2001

11. Academic procession and Attended IARI PG School Convocation of Feb. 08, 2002

12. Board of Studies meeting in Ag. Statistics for number of seats and applications for research guides on Feb. 14, 2002

13. 355th meeting of IARI PG School, Academic Council on Mar. 15, 2002

14. Meeting of Central Examination Committee at New Delhi on Mar. 16, 2002.

Related to Administrative

1. Meetings of the quartely Rajbhasha Karyanvan Samiti (Official Language Implementation Committee) of the Institute held on Apr. 17, Jul. 5, Oct. 8, 2001 and Jan. 5, 2002. The meetings were chaired by the Director.
2. Meeting with DG ICAR, DG CPWD for reviewing the progress of Civil works of ICAR at New Delhi on Jul. 19, 2001

3. Meeting of the committee for developing inter institutional linkages among institues, NRCs, PDs and Bureau located at Delhi on Jul. 23, 2001.

4. Meeting of the Library Advisory Committee of the Institute held on Aug. 18, 2001 at New Delhi. The meeting was chaired by the Director.

5. Meetings with CPWD, on Aug. 22, Sept. 7, Sept. 10, Sept. 19, Oct. 17, 2001.

6. Hindi Chetna Maas (Month) Samaroh followed by Kavya Paath on Sep. 1, 2001 chaired by the Director of the Institute.

7. Meeting of Directors of Institutions on IASRI Campus to discuss common issues on Sep. 4, 2001

8. Hindi Samaroh- Vaad-Vivaad Pratiyogita: "NIJIKARAN DESH KE HIT MEIN HAI" on Sep. 11, 2001

9. Hindi Samaroh- Dr. Daroga Singh Memorial Lecture: Dr. D.N. Jha Delivered a talk on "Agricultural Research Management-New Challenges". HINDI DIVAS on Sep. 14, 2001.

10. Hindi Samaroh on Antakshri Pratiyogita on Sep. 19, 2001 chaired by the director.

11. Heads of Divisions meeting at IASRI to finalize QRT (1996-2000) document on Sep. 20, 2001. The meeting was chaired by the Director.

12. Hindi Chetna-Maas Samapan Samaroh. Chief Guest, Shri Pratyush, Financial Adviser, DARE, New Delhi held on Oct. 1, 2001.

13. The ASRB examination for Scientist recruitment and SRF on Oct 22-24, 2001. Director of the Institute conducted and supervised the examination as Chief Supervisor.

14. Administered pledge to the staff regarding abstaining from corruption at the beginning of Vigilance awareness week on Oct. 31, 2001.

15. Meeting with Delhi Jal Board, regarding excessive billing of water for connection no. 13967 at IASRI (12000KL/pm) on Jan. 2, 2002. The meeting was chaired by the Director.

16. Meeting with Addl. Secretary, DARE & Secretary, ICAR regarding computerization at New Delhi on Jan. 04, 2002.

17. High Level Inter Divisional Committee (HLD) meeting to discuss Zero Based Budgeting at New Delhi on Feb. 01, 2002.

18. Hindi Workshop for Technical staff on Feb. 12, 2002 inaugurated by the Director of the Institute.

Related to Professional Society ISAS/SSCA

1. ISAS Executive Council meeting as Secretary held at New Delhi on Apr. 3, 2001.

2. Executive Council Meeting of the Society of Statistics, Computer and Applications at Delhi on Oct. 8, 2001.

3. Editorial Board Meeting of the Journal of India Society of Agricultural Statistics Chaired by Dr. BBPS Goel on Jun. 23 and Oct. 20, 2001.

4. ISAS PV Sukhatme Gold medal award committee meeting chaired by Dr. BN Singh on Nov. 15, 2001.

5. ISAS Dr. DN Lal memorial Lecture award committee meeting chaired by Dr. KC Seal on Nov. 15, 2001.

6. Executive Council meetings of Indian Society of Agricultural Statistics, Chaired by Dr. R.S. Paroda on Jul. 04 and Nov. 16, 2001.

Miscellaneous

1. Inaguration of CAB International's New Delhi Office at NASC Complex (Dr. Denis Blight, DG, CAB Intl., UK) on May 8, 2001

2. Advisory Committee Meeting chaired by Secretary, Ministry of Statistics & P.I., for the CSO Awards for CR Rao Young Scientist at New Delhi on May 11, 2001.

3. Meeting with Dr. Rip Landes Senior Economist, Economic Research Service, USDA regarding collaboration in developing Socio-Economic database on Jun. 20 and 28, 2001.

4. ICAR Annual General Meeting (AGM) and ICAR award ceremony on Jul. 16, 2001.

5. 40th All India Wheat Research Workers Meet- 2001 at New Delhi on Aug. 22, 2001.

6. Panel Discussion arranged by Agricultural Economics Division, IARI on WTO and New International Trade Regime: Implications for Indian Agriculture at New Delhi on Aug. 25, 2001.

7. Meeting with DDG (Engg.) for DDE ORG presentation on Intranet Solution Informa at New Delhi on Aug. 30, 2001

8. Review meeting for Interim Report on financial management reforms for ICAR and purchase manual for ICAR in ICAR CR No. 1, Financial Advisor in Chair on Sep. 05, 2001

9. Meeting regarding MIS development for ICAR and information system development to DARE International Cooperation Section on Sep. 05, 2001.

10. Meeting with Dr. Vijayaditya, DG, NIC and his team for a possible solution to IASRI networking problems held on Sep. 7, 2001.

11. Meeting with Dr. Rip Landes from Economic Research Service, USDA, for digitization of Databases in Socio economics related to Agriculture on Sep. 11, 2001

12. Presentation on Project of Nationa Bureau of Fishery Genetic Resources at New Delhi on Sept. 12, 2001

13. Discussions about the role of IASRI with the visiting dignitary to the Institute, Mr. Thierry Boisseaux, Commercial Attache, Economic Trade and Finance Commission Embassy of France in India on Nov. 20, 2001.

14. Wrap up meeting of the FAO Mission on Formulation of Information Support Programmes at New Delhi on Nov. 29, 2001

15. 2nd meeting of Regional Working Group for Information Management and Networking at New Delhi on Jan. 26-31, 2002

16. Meeting of sports committee for Inter Zonal sports meet at IARI from Feb. 27 to Mar 3 in Kabaddi & Carrom on Feb. 14, 2002. The meeting was chaired by the director.

17. Meeting of Evaluation Committee for hiring training Institute to organize Computer Training for Scientific, Technical and Agministrative Staff at ICAR Headquarters on Feb. 21, 2002

18. Opening Ceremony for ICAR Inter Zonal Sports at PG School Ground : Secretary ICAR inaugurated on Feb. 27, 2002.

Lectures Delivered by the Scientist at other organisations

Prof. SD Sharma

- Delivered a lecture on National Agricultural Statistics Systems – Relevance to Social Sciences during training workshop at the Division of agricultural Extension, IARI on Aug 27, 2001
- Delivered an invited lecture on 'Role of Statistics and Computers in Agricultural Research' during the Annual conference of Society of Statistics, Computer and Applications at Rajkot (Gujarat) during Nov 24-26, 2001
- Delivered inaugural address on Database applications in dairy research and Management at NDRI, Karnal on Dec 19, 2001
- Delivered PV Sukhatme Memorial Lecture entitled 'Agricultural Statistics System' at the Valedictory Function of the National Conference on 'Research and Development in Farm Sector with a human face' held at BCKV, Mohanpur, Kalyani, West Bengal on Feb 7, 2002

Dr. P.K. Malhotra

- Delivered a lecture on M & CE and PIMS in the "Sensitisation -cum-Training Workshop of Scientists of PME Cells in ICAR Institutes and SAUs" held at NCAP, New Delhi on 14-15 January, 2002

Dr. Ranjana Agrawal

- Delivered a lecture on 'Sampling procedures' in the training course on 'Advances in Extension Research' on 27.8.2001 at Division of Agril. Extension, IARI, New Delhi.

Dr. R.K. Pandey

- Delivered two lectures entitled (i) Measurement of technological change in agriculture on 10th October, 2001 and ii) Construction of cost of living index number for rural India on 12th October, 2001 in the training programme organised under CAS in IARI, New Delhi.

Dr. VK Sharma

- Delivered a seminar talk on A statistical investigation on the long-term effect of fertilizers on productivity of cereal crop sequences at the Department of Statistics, University of Pune on 10th July, 2001

Dr. R.C.Goyal

- Presented the final version of M&CE and PIMS in the workshop on "Operationalisation of Strategic Research Initiatives" under NATP during 15th to 16th January, 2002 at National Institute on Agricultural Extension Management (MANAGE), Hyderabad.

Dr. S.S. Kutaula

- Delivered three lecture entitled (i) Profit Function Models: An Eclectic View of Economic Emprism via UOP Profit Function, (ii) Testing Relative Economic Efficiency of Punjab Farmers and (iii)

Estimating Farm-Specific Technical Efficiency of Haryana Farmers to the participants of CAS Training Course on Role of Social Science in Agrobiological Research, at Division of Agricultural Economics, Indian Agricultural Research Institute, New Delhi-110012 on 28.03.02.

Dr. Rajender Parsad

- Delivered four lectures on i). Characterization properties and analysis of general block designs (2 lectures) ii). BIB designs (1 lecture) iii). SPSS: An Overview (1 lecture) to the participants of the Refresher Course in Statistics entitled "Recent Developments in Statistics" at Department of Statistics, University of Delhi, Delhi-110 007 during May 1- May 21, 2001. The lectures were delivered on May 3, May 4, May 11 and May 14, 2001 respectively.

- Delivered two lectures on Concepts and Applications of Multivariate Techniques in Economics Research to the participants of the training programme on the theme Sustainable Agricultural Development for Food Security held at Division of Agricultural Economics, IARI, New Delhi during October 9 - 29, 2001. The lecture was delivered on October 22, 2001.

- Two lectures on Response Surface Methodology during the International Conference on the Use of Technology in teaching and learning of Mathematics and Mathematics held at University of Delhi, South Campus, New Delhi 110 021 during December 15-19, 2001. The lectures were delivered on December 19, .2001.

Dr. A.R. Rao

- Delivered a lecture on "Biostatistics" to P.G. students, Biotechnology programme, Jiwaji University, Gwalior from 19.11.2001 to 24.11.2001.

Dr. L.M. Bhar

- Delivered a lecture on **"**Non-linear models for forecasting fish production from ponds" in National workshop cum Training Programme on Bio informatics and statistics in Aquaculture Research, held during Jan. 8 to Jan. 11, 2002 at CIFA, Bhubneshwar.

Dr. Ramasubramanian, V.

- Delivered two lectures entitled i) " SPSS - Correlation & Regression" and ii) "SPSS - Non-parametric Analysis" on 1.3.2002 at NRC on Camel, Bikaner in the training programme "Advances in information technology & data base management" held from 6.2.2002 to 5.3.2002.

Dr. D.R. Singh

- Delivered a lecture on sustainability efficiency and equity implications of groundwater markets in advance training course in the Division of Agricultural Economics, IARI, New Delhi on October 20, 2001.

Dr. Anil Rai

- Delivered a lecture "Data Warehousing concepts in context of NARS in a workshop on "Database Applications in Dairy Research and Management" at NDRI, Karnal on 20th December, 2001.

Sh. Sudeep

- Delivered a lecture "Expert System in Animal Sciences" in a workshop on "Database Applications in Dairy Research & Management" held at NDRI, Karnal on 20th December, 2001.

Visits Abroad

Prof SD Sharma

- Visited Beijing, China during Nov 4-6, 2001 for attending '2001 International Conference on the Development of Agricultural Information Management, Technology and Markets in the 21st Century' and presented a paper on 'Agricultural Information Management – Systems and Services

Dr AK Srivastava

- Visited Rome, Italy to participate a meeting on 'Technical Review of the Programme for the World Census of Agriculture at FAO Headquarter' during June 4-8, 2001. During this period he also participated in an 'International Conference on Agricultural and Environmental Statistical Applications in Rome (CAESAR) held at Rome from June 5-7, 2001. In this Conference, he also presented an invited paper entitled 'National Agricultural Census in Developing Countries and the Programme for the World Census of Agriculture-2000'

Visits to other Organizations

- Prof. SD Sharma, Chief Supervisor, visited the Examination Center for ASRB examination for drive recruitment for North East Region during Dec. 26-28, 2001
- Prof. SD Sharma visited NAARM, Hyderabad as a member of team comprising of Secretary, IcAR and National Director, NATP for NAARM Infrastructural Development Program under NATP on Jan. 9-10, 2002.
- Sh. V.K. Jain, Dr. Man Singh, Sh. G.M. Pathak and Sh. B. Patel visited Lalitpur district (U.P.) for ground truth data collection and supervision of field data collection relating to the AP Cess funded project entitled "A study of land use statistics through integrated modelling using GIS" during May 31-June 02, 2001.
- Sh. V.K. Jain, Dr. Man Singh and Sh. Santosh Kumar visited Lalitpur district (UP) for ground truth data collection of Kharif season and supervision of field data collection relating to the AP Cess funded project entitled "A study of land use statistics through integrated modelling using GIS".
- Scientists visited to the commodity concerned co-operating centres under the "Mission Mode NATP project entitled "Assessment of Harvest and Post-harvest Losses".
- Dr. Randhir Singh visited NIC office to look into code structure of GISTNIC project and Andhra Pradesh Technology Services Ltd to see their warehousing project at Hyderabad.
- Dr Randhir Singh visited NAARM, Hyderabad during Oct. 17-24, 2001 for attending the "Sr. Course on Stress Management"

- Sh. R.S. Khatri and Sh. J.P. Goyal visited to Bangalore during Oct. 6-12, 2001 to have discussions with Director/ Jt. Director (Statistics), Directorate of Animal Husbandry and Vety. Services to work out the modalities for the commencement of the field work under the project "Estimation of wool production-emerging data needs and a methodological reappraisal".

- Sh. J.P. Goyal visited Bangalore during Nov. 17-27, 2001 to recruit the Field Investigators for the data collection and also to impart training for filling the schedules, selection of households and sheep in the selected households. The field work under the survey started on Nov. 26, 2001.

CHAPTER -15

PAPERS PRESENTED BY THE SCIENTISTS OF THE INSTITUTE AT THE CONFERENCES/ WORKSHOPS/SEMINARS, ETC.

Sr.No.	Author(s)	Title of the paper	Programme	Venue	Period
1.	Srivastava, AK Ajayi, OO	The National Agricultural Census in Developing Countries and the Programme for the World Census of Agriculture 2000	International Conference on Agricultural and Environmental Statistical Applications	Rome	June 05-07, 2001
2.	Rai, Anil	National Agricultural Insurance Scheme	National Workshop on "Improvement of Agricultural Statistics" organised by Directorate of Eco. & Stat., Deptt. of Ag. and Coop., Min. of Agriculture	Vigyan Bhawan, New Delhi	June 13-14, 2001
3.	Sud, UC	Contemporary issues relating to agricultural statistics	-do-	-do-	-do-
4.	Sud, UC	Remote sensing & GIS applications in Agriculture	National Symposium on "Statistical Methods for plantation Crop Research"	Kayangulam Research Station of CPCRI	June 19-20, 2001
5.	Dhillon, BS Singh, M Gupta, VK Parsad, Rajender Singh, BB	Evaluation and use of plant genetic resources: advances, Issues and opportunities	Symposium on Plant Genetic Resources Management: Advances and Challenges	NBPGR, New Delhi	Aug 1-4, 2001
6.	Kumar, Amrender Agrawal, Ranjana	Forecasting of wheat yield using weather parameter	National Seminar on Agrometeo--rological Research for Sustainable Agricultural Production.	Gujarat Agriculture University, Anand	Sept. 27-28, 2001.
7.	Mehta, SC Agrawal, Ranjana, Sharma, Shashi; Shukla, RP	A statistical model for prediction of mango fruitfly outbreak.	-do-	-do-	-do-
8.	Baboo, R Kumar, M Singh, D Kumar, Anil Garg, RN Kumar, Rajendra	Response of cluster bean (Cyamopsit tetragonoloba) to rhizobium inoculation, nitrogen and phosphorus application	National Symposium on Farming Systems Research in New Millennium	Modipuram, Meerut	Oct. 15-17, 2001
9.	Gupta, VH, . Singh, RP Kumar, Anil	Study of correlation between physical properties of sandy loam soil and yield of late sown wheat as influenced by various tillage practices	-do-	-do-	-do-
10.	Kumar, Anil Panwar, Sanjeev Kaur, Rajinder Kaur, Ajit	Statistical assessment of viability pattern of various crops grown in Agra district of U.P.	-do-	-do-	-do-
11.	Kumar, M Baboo, R Kumar, Anil	Response of carrot seed crop to N and P fertilization under varying row spacings	-do-	-do-	-do-
12.	Sharma, SD	Agricultural Information Management – System and Services	2001 International Conference on the Development of Agricultural Information Management, Technology and Markets in the 21st Century	Beijing, China	Nov 4 - 6, 2001
13.	Bhatia, VK	Recent Developments and current status in Statistical Genetics and Biostatistics	XIII National Conference of Agricultural Research Statisticians	PAU, Ludhiana	Nov 6-8, 2001
14.	Bhatia, VK	Identification of problems for	-do-	-do-	-do-

Sr.No.	Author(s)	Title of the paper	Programme	Venue	Period
		future research in the area of statistical genetics and bio-statistics			
15.	Gupta, VK Parsad Rajender	Current status of experimental design and challenges ahead	-do-	-do-	-do-
16.	Kumar, Vikas Goyal, RC	A searching solution for small site or Intranet	-do-	-do-	-do-
17.	Mahajan, VK Malhotra, PK	Teaching and Training in Computer Applications in Agriculture	-do-	-do-	-do-
18.	Malhotra, PK	Computer Application in Agriculture Research and Development-Research Needs	-do-	-do-	-do-
19.	Parsad, Rajender Sharma, SD Gupta, VK	Agricultural statistics - problems for future research	-do-	-do-	-do-
20.	Prajneshu	Statistical Modelling : Some future research problems	-do-	-do-	-do-
21.	Rai, Anil Misra, Prachi	Some aspects of computer intensive statistical techniques for future research	-do-	-do-	-do-
22.	Rai, Anil	Data Warehousing in NARS Status, Prospects and Issues in Future	-do-	-do-	-do-
23.	Rai, Anil Misra, Prachi	Some aspects of computer intensive statistical technique for future research.	-do-	-do-	-do-
24.	Sharma, SD Malhotra, PK Goyal, RC Arora, Alka	Networking of Agricultural Statisticians	-do-	-do-	-do-
25.	Sharma, SD Sharma, VK Jaggi Seema	Teaching of agricultural statistics status and challenges ahead.	-do-	-do-	-do-
26.	Singh, Randhir	Use of satellite data and farmers eye estimate of yield for crop yield forecasting	-do-	-do-	-do-
27.	Singh, Randhir Misra, Prachi	Integrated National Agriculture Resource Information System (INARIS) – A step towards quality data	-do-	-do-	-do-
28.	Sud, UC Bathla, HVL	Agricultural Statistics-Current Status and Challenges	-do-	-do-	-do-
29.	Rao, AR Prabhakaran, VT	A bootstrap method of estimating heritability from varietal trial data	Diamond Jubilee Symposium	IARI, New Delhi	Nov. 6-9, 2001
30.	Ghosh, H. Das, A	Optimal diallel cross design for interval estimation of heritability	4th Annual Conference of SSCA	Saurashtra University, Rajkot	Nov. 23-25, 2001
31.	Lahiri, Aloke Das, MN	An alternative treatment of systematic sampling	4th Anuual Conference of the Society of Statistics, Computer and Applications	Saurashtra University, Rajkot, (Gujarat)	Nov. 24-26, 2001
32.	Satpati, Subrata -Kumar Parsad, Rajender	Nested partially balanced incomplete block designs	-do-	-do-	-do-

Sr.No.	Author(s)	Title of the paper	Programme	Venue	Period
33.	Sharma, SD Batra, PK Sharma, VK Sharma, NK	Evaluation of fertilizer response ratios for different crops at regional and national level	-do-	-do-	-do-
34.	Sharma, VK Kaur, Rajinder	On analysis of long-term fertilizer experiments	-do-	-do-	-do-
35.	Sud, UC	System modelling in Nematology – Current status & future prospectus	National Congress Centenary of Nematology in India	Division of Nematology, IARI, New Delhi	Dec. 5-7, 2001
36.	Singh, Randhir	Use of satellite data and farmers' eye estimate for crop yield modelling	National Symposium on "Recent advances on remote sensing and GIS technologies for natural resources management"	CSRE, IIT, Bombay	Dec 5-7, 2001
37.	Bhar, Lalmohan, Gupta, V.K. Sarkar, Subhra	Outliers in block designs	International Conference on Design of Experiments: Recent Trends and Future Directions	Department of Statistics, University of Delhi, Delhi	Dec. 27-30, 2001
38.	Ghosh, H. Das, A.	E-optimal design for interval estimation of heritability	-do-	-do-	-do-
39.	Gupta, VK Bhar, LM Sarkar, S	Outlier in block designs.	-do-	-do-	-do-
40.	Parsad, Rajender Gupta, VK Parsad, NSG	Structurally incomplete row-column designs and their applications	-do-	-do-	-do-
41.	Pandey, RK Kaul, Sushila Joshi, Sanchi	Economic Liberalization and its Impact on Employment in Indian Agriculture	84th Annual Conference of Indian Economic Association	Institute of Technology, Vellore	Dec. 28-30, 2001
42.	Garg, RN Kumar, Rajendra Gupta, VH Gupta, VK Das, DK Arora, R.P. Pathak, H	Study of correlation between physical properties of sandy loam soil and yield of wheat influenced by biogas slurry and fly ash	89th Session of Indian Science Congress Association	University of Lucknow	Jan. 3-7, 2002
43.	Jaggi, Seema Sharma, VK Varghese, Cini	Minimal balanced repeated measurements designs	-do-	-do-	-do-
44.	Singh, RN Sharma, SD	A generalized probability model for forward birth interval	-do-	-do-	-do-
45.	Vats, MR	Planning,designing & analysis of LongTerm FertilizerExperiments	Workshop on LTFE	Birsa Agril. Uni. Ranchi,	Jan. 14-16 , 2002

Sr.No.	Author(s)	Title of the paper	Programme	Venue	Period
46.	Bhardwaj, SP	Economic Study of Poultry Production in India	55th Annual Conference of ISAS	CIAE & IISS, Bhopal	Jan 15-17, 2002
47.	Bhatia, VK	Statistical modelling of spatial variability in intercrop experiment	-do-	-do-	-do-
48.	Ghosh, H	Optimal design for point X interval estimation of ratio of variance components in one way ANOVA model	-do-	-do-	-do
49.	Gupta, AK Mogha, AK Jain, VK	Estimation of wheat production in 2020	-do-	-do-	-do-
50.	Lahiri, Aloke Mehta, DK Parsad, Rajender	On designing and analysis of experiments under AICRP on soil test crop response correlation	-do-	-do-	-do-
51.	Pal, Satya Singh, Jagbir Narang, MS	Agro-techno status of farming community	-do-	-do-	-do-
52.	Pal, Satya Sood, RM Gupta, AK	Estimation of contribution of input factors on the milk yield	-do-	-do-	-do-
53.	Panda, DK Parsad, Rajender Sharma, VK	Robustness of block designs for complete diallel crosses against interchange of a pair of crosses	-do-	-do-	-do-
54.	Rao, AR Prabhakaran,VT	Simultaneous selection of genotypes for yield and stability in crop improvement trials	-do-	-do-	-do-
55.	Satpati, Subrata Kumar Parsad , Rajender	Nested block designs for making test treatments - control treatment comparisons	-do-	-do-	-do-
56.	Sharma, VK Kaur, Rajinder	Estimation of return from a permanent plot experiment with two crop sequences.	-do-	-do-	-do-
57.	Singh, Jagbir Jain, VK	Estimation of varietal yields and standards of pepper	-do-	-do-	-do-
58.	Singh, Randhir	Land use/Land cover statistics and extent of floods in district Rohtak, Haryana during 1997-98 using remote sensing satellite data	-do-	-do-	-do-

Sr.No.	Author(s)	Title of the paper	Programme	Venue	Period
59.	Srivastava, R Parsad, Rajender Gupta, VK	Non-proper block designs for balanced confounded Factorial Experiments	-do-	-do-	-do-
60.	Sud, UC Srivastava, AK Sethi, IC	On Some aspects of proximal estimators in repeat surveys	-do-	-do-	-do-
61.	Sudeep, Goyal, RC Malhotra, PK	Intranet solutions for research organizations	-do-	-do-	-do-
62.	Varghese, Cini Sharma, VK Jaggi, Seema	On higher-associate class partially balanced incomplete block designs	-do-	-do-	-do-
63.	Parsad, Rajender Gupta, VK	Statistical techniques for optimizing input requirements for cropping systems	Symposium on Statistical Model for optimizing nutrient recommendations for cropping systems organised during the above conference	-do-	-do-
64.	Lahiri, Aloke Mehta, DK Parsad, Rajender	Status paper on designing and analysis of experiments conducted under AICRP on soil test crop response correlation	National Workshop of AICRP on Soil Test Crop Response Correlation.	B.C.K.V.V., Kalyani (W.B.)	Jan. 31-Feb. 2, 2002
65.	Sharma, VK Kaur, Rajinder	On analysis of long-term fertilizer experiments Integrated National Agricultural Resources	Map India – 2002, the 5th Annual International Conference on GIS, GPS Aerial Photography and Remote Sensing	New Delhi	Feb 6-8, 2002
66.	Singh, Randhir	Information System (INARIS)- concept and development	-do-	-do-	-do-

CHAPTER -16

WORKSHOPS, SEMINARS, SUMMER INSTITUTES, FARMERS' DAY ETC.

Workshops

- Institute organised a launch/ interaction Workshop on a Mission Mode NATP project entitled "Pilot study on assessment of harvest and post harvest losses" on April 11, 2001. Dr. HVL Bathla, Principal Scientist and Head of the Sample Survey Division & Principal Investigator of the project convened the workshop. Dr A. Alam, DDG(Engg.) was in chair. All the CCPIs attended the Workshop.

- Institute organised another launch/ interaction Workshop on a Mission Mode NATP project entitled "Integrated National Agricultural Resources Information System" on April 12, 2001. Dr. Anil Rai, Senior Scientist & Principal Investigator of the project convened the workshop. Dr A. Alam, DDG(Engg.) was in chair. All the CCPIs attended the Workshop.

- First Interaction Workshop of the Mission Mode NATP project "Assessment of Harvest and post-harvest losses" was organised at lead centre, IASRI, New Delhi during Sept. 13-15, 2001. Apart from the scientists involved in the project, the Mission Leader, National Coordinator (NATP), subject matter specialists from Non Government Organisations, PI's of other related projects also participated in the deliberations of the workshop. At the outset, PI of the project presented an overall view. Thereafter the CCPI's from the cooperating centres made a presentation regarding the schedules and detailed document pertaining to their respective commodities. After introduction, the relevant review of the literature regarding assessment of losses, causes of losses and reduction of losses, marketing channels and respondents to be covered in the sample, the sampling design to be followed, the periodicity of data collection, sample size to be selected at various levels and the different schedules to be used were presented by the CCPI's and discussed at length. Suggestions made by the experts were incorporated.

- A Workshop on "Economic Accounts for Agriculture" conducted jointly by the Food and Agriculture Organization (FAO) of the United Nations and the United Nations Statistical Institute for Asia and

the Pacific (SIAP) was organised at IASRI, New Delhi during December 10-15, 2001. The participants were from Bangladesh, Bhutan, Cambodia, Islamic Republic of Iran, Laos, Nepal, Pakistan, Sri Lanka and India. Dr. H.V.L. Bathla, Principal Scientist & Head, Division of Sample Survey was the Course Director for the workshop and also Chairman for all the technical sessions of the workshop. Dr. S.D. Sharma, Director of the Institute was one of the resource persons.

Summer School

A Summer School on "Quantitative Techniques in Production Economics Research" was organised by the Division during 15th May to June 4, 2001. Twenty five participants working in various ICAR Institutes and State Agricultural Universities participated in this course which was inaugurated by Prof. S.D. Sharma, Director, IASRI. The faculty for the course was drawn from IASRI, IARI, NCAP, ICAR, Indian Council of Medical Research, Indian Statistical Institute, Agricultural Economics Research Centre, Delhi University, National Council of Applied Economic Research, Indian Institute of Public Administration, New Delhi. The valedictory function organised on 4th June, 2001, was chaired by Director, IASRI, New Delhi.

The Annual Day

The Annual Day of the Institute was celebrated on July 2, 2001. As part of these celebrations, a debate contest for Technical and Administrative Staff on the topic 'Voluntary Retirement Scheme is Desirable for Healthy Work Culture' was held on June 30, 2001. Prizes were awarded to first and second speakers namely Sh. U.C. Bandooni T-5/ Sh.Anil Agarwal, Jr. F. & A.O. (tied at first place) and Sh. S.K. Upadhayay T-6. Won second prize.

In the forenoon of July 2, 2001, another declamation contest for students and scientists was held on the topic 'Women Empowerment for National Development'. The prizes were awarded to Ms Sonali Das Scientist CA/ Dr. G.K. Jha Scientist AS (tied at first place) and Ms Anshu Dixit Scientist as second prize winner. Among the students the first two prizes were bagged by Sh.Jugnu Ansari Ph.D.(Ag.Stat.) and Sh. Bijay Kumar Behra M.Sc.(Ag.Stat.).

In the afternoon session, the main Annual Day function was celebrated in which Sh. J.N.L. Srivastava, Secretary, Department of Agriculture and Cooperation, Ministry of Agriculture Govt. of India was the Chief Guest. Dr. N.S. Sastry, Director General & C.E.O., National Sample Survey Organisation, Ministry of Statistics and Programme Implementation delivered the eleventh Nehru Memorial Lecture entitled 'Scope for improvement in Agricultural Statistics' The late Shri V.V.R. Murthy Award was awarded to Shri Amitava Dey, M.Sc. (Ag.Stat.) course during the year 1998-2000. The Nehru Memorial Gold Medals were awarded to Shri Amitava Dey M.Sc. (Ag.Stat.) student during the year 1998-2000 and Miss Rachna Chadha, M.Sc. (C.A.) student during the year 1997-2000. Late Shri M.K. Bose Memorial Prize was awarded to Shri Arun Pratap Singh, departmental candidate securing highest marks in the examination for Senior Certificate Course in Agricultural Statistics and Computing during the year 2000.

Seminars

Salient outcome from the completed research projects undertaken in different aspects of Agricultural Statistics and Computer Application were presented in the seminars organised regularly in the Institute. Open seminars were organized for new research projects proposed. Outline of Research Work (ORW) seminars, Course seminars and thesis seminars were delivered by the students of M.Sc. and Ph. D. Agricultural Statistics and M.Sc. Computer Application.

During the year a total of 73 (seventy three) seminar talks were held. Out of these, 53 were delivered as student seminars (9 thesis seminars, 13 ORWs and 31 course seminars), 13 by scientists of the Institute and 7 by Guest speakers. The details of guest speakers are as follows:

Sr. No.	Name	Date	Title
1	Dr Rajiv Mehta, Additional Statistical Advisor, NCFC, Ministry of Agriculture Krishi Bhavan, New Delhi-1210001	July 7, 2001	Coping Strategies for WTO agreement
2	Sh SC Rai, Ex-Principal Scientist, UASRI, New Delhi-110012	Sept 21, 2001	Regional Disparities in Socio-Economic Development of M.P.
3	Prof Aloke Dey, Head, ISI, Delhi Centre, 7 SJS Sansanwal Marg, Delhi-110016	Oct 19, 2001	Optimal main effect plans with non-orthogonal blocking
4	Prof VL Chopra, Former Secretary, DARE and Director General, ICAR	Nov 28, 2001	Genetically Altered Crops
5	Sh Naval Khosla, Microsoft Crop (India) Pvt. Ltd.	Dec 01, 2001	Microsoft technology offering in business productivity
6	Prof TJ Rao, ISI, 203, BT Road, Kolkatta-700 035	Dec 26, 2001	Allocation problems in stratified sampling
7	Professor Feng Shun Chai, Institute of Statistical Science, Academia Sinica, Taipei, Taiwan	Jan 02, 2002	Block designs for asymmetric parallel line assays

Seminar Association has compiled a complete write ups of the student course seminars and the abstracts of other seminars conducted during September-December, 2001 for the benefit of the students and research personnel in national agricultural research system.

CHAPTER -17

DISTINGUISHED VISITORS

INDIAN

1. Dr Panjab Singh,
   Director,
   IARI, New Delhi-110012
   (Presently Director General, ICAR)

2. Dr Padam Singh,
   Additional Director General,
   Indian Council of Medical
   Research
   & Chairman, QRT
   Ansari Nagar,
   New Delhi-110029

3. Sh JNL Srivastava,
   Secretary,
   Department of Agriculture &
   Cooperation, Ministry of
   Agriculture
   New Delhi

4. Dr NS Sastry,
   Former DG & CEO,
   NSSO, Ministry of Statistics and
   Programme Implementation,
   New Delhi

5. Prof. VL Chopra,
   Former Secretary,
   DARE & Director General,
   ICAR, Krishi Bhavan,
   New Delhi-110001

6. Dr Anwar Alam,
   Dy. Director General (Engg.)
   ICAR, Krishi Anusandhan
   Bhavan, KAB-II,
   Pusa, New Delhi-110012

7. Dr AC Kulshreshtha,
   Deputy Director general,
   Ministry of Statistics &
   Programme Implementation,
   Central Statistical Organisation,
   Sardar Patel Bhavan,
   Sansad Marg,
   New Delhi-110001

8. Sh M. Moni,
   Deputy Director General,
   National Informatics Centre,
   CGO Complex, A-Block,
   Lodhi road,
   New Delhi-110003

9. Sh M Neelkantan,
   Dy. Director General(FOD),
   National Sample Survey
   Organisation (NSSO), Faridabad

10. Dr JP Mishra,
    Asstt. Director General (ES&M),
    ICAR, Krishi Bhavan,
    New Delhi-110001

11. Dr Bal BPS Goel,
Former Director,
B-77, Naraina Vihar,
New Delhi110028

12. Sh DK Trehan,
Economic & Statistical Advisor,
Directorate of Economic and
Statistics, Ministry of Agriculture,
Krishi Bhavan, New Delhi-10001

13. Dr VK Srivastava,
Additional Statistical Advisor,
Directorate of Economic &
Statistics, Ministry of Agriculture,
Govt. of India, New Delhi-110001

14. Dr G Nageswara Rao,
Former Professor,
Deptt. of Statistics, ANGRAU,
3-4-63/19/J, Krishna Sai,
Shri Ramana Puram Uppal, P.O.
Hyderabad-500 039 (AP)

15. Dr Rajiv Mehta,
Additional Statistical Advisor,
NCFC, Ministry of Agriculture,
Krishi Bhavan,
New Delhi-110001

16. Dr SN Mishra,
Chairman,
Society of Economic & Social
Research,
JR Complex No. 2,
HCMR Farms, Village-Mandoli,
Delhi-110093

17. Dr. KR Satyamurthy,
Advisor (Statistics),
Deptt. of Animal Husbandry &
Dairying, Ministry of Agriculture,
Krishi Bhavan,
New Delhi – 110 001

18. Sh SK Sinha,
Dy. Registrar General,
Office of the Registrar
General of India,
RK Puram, New Delhi

19. Sh. AK Srivastava
Joint Director (FOD),
National Sample Survey
Organisation (NSSO),
Faridabad

20. Sh SC Rai,
Ex-Principal Scientist,
IASRI,
New Delhi – 110012

21. Dr. Aloke Dey,
Head, ISI, Delhi Centre,
7, SJS Sansanwal Marg,
Delhi-110016

22. Sh Naval Khosla,
Microsoft Crop (India) Pvt. Ltd.,
New Delhi

23. Prof TJ Rao,
ISI, 203, BT Road,
Kolkata-700 035

24. Dr. S. Mohanty,
VIM-242, Saila Shree Vihar,
Bhubaneshwar 751021 (Orissa)

25. Sh Ratan Mandal,
Lecturer,
Deptt. Of English,
TNB College, Bhagalpur
Bihar

26. Dr Ram P Katyal,
19-C MIG Flats,
Rajouri Garden,
New Delhi

27. Sh HT Mohan Kumar
Dimbada Estate,
Hurudi Oist, 577 119,
Sakleshpur Taluk,
Hasan Distt.
Karnataka

28. Dr. LS Kaushik
Deptt. Of Mathematics & Statistics
CCS Haryana Agricultural
University, Hissar

29. Sh Fateh Jang Singh,
Statistician,
Department of Agriculture,
Govt. of Punjab, Punjab

30. Dr Parmatma Singh,
Dean,
IARI, New Delhi-110012

31. Sh Rajesh Kumar Gupta,
Dy. Director (Stat.),
Govt. of UP

FOREIGN

1. Mr. Carmelita Ericta,
Phillippines

2. Mr. LR Naiken
Mauritius

3. Mr. Pratap Narain,
Senior Officer,
FAO

4. Mr. Thomas Africa,
Director
SIAP

5. Mr. Xiaoning Gong,
Lecturer,
SIAP

6. Prof. Feng-Shun Chai,
Institute of Statistical Sciences,
Academia Sinica, Taipei,
Taiwan

7. Mr. Robert Mose,
Director,
Synergy Oxford Centre for
Innovation,
Mill Street, Oxford, UK

8. Mr. Dylan Winder,
Communication Manager,
Rural Livelihood Department,
1 Palace Street, London

9. Mr. Thierry Boisseaux,
Commercial Attache,
Economic Trade & Finance
Commission, Embassy of
France in India

10. Dr. Rip Landes,
Senior Economist,
Economic Research Service
U.S. Department of Agriculture,
A-11, West End, New Delhi-23

CHAPTER -18

IASRI PERSONNEL
(As on 31.03.2002)

Prof. SD Sharma, **Director**
Dr AK Srivastava, **Joint Director**

Division of Sample Survey

Dr HVL Bathla,
Principal Scientist and Head

Principal Scientist

Dr Randhir Singh
Dr KK Tyagi
Dr DL Ahuja
Dr BC Saxena
Dr UC Sud
Shri RS Khatri
Shri SRS Arya

Sr. Scientists

Dr MS Narang
Dr Jagbir Singh

Scientists (SG)

Shri DC Mathur
Shri JP Goyal
Shri SC Agarwal
Shri Satya Pal
Shri RC Gola
Shri VK Jain
Shri KK Kher

Scientist (Sr. Scale)

Shri SC Sethi
Shri Bhagwan Das
Shri RM Sood

Scientist

Dr. Tauqueer Ahmad
Dr. GK Jha
Shri AK Gupta
Mrs Prachi Misra Sahu
Shri RM Bhasin

Division of Design of Experiments

Dr VK Gupta, *Principal Scientist & Head*

Principal Scientist

Dr VK Sharma
Dr Ravindra Srivastava
Dr DP Handa
Dr PK Batra

Sr. Scientists

Shri JK Kapoor
Dr Aloke Lahiri
Dr Rajender Parsad
Dr Kishan Lal

Scientist (SG)

Smt. Rajinder Kaur
Shri MR Vats
Shri NK Sharma

Scientist (Sr Scale)

Shri DK Mehta
Shri DK Sehgal
Shri GL Khurana
Smt Ajit Kaur
Dr Seema Jaggi

Scientist

Dr Cini Varghese
Shri Rajendra Kumar
Shri Anil Kumar

Division of Biometrics

Dr. AK Srivastava, *Joint Director & Head*

Principal Scientist

Dr Prajneshu,
Dr VT Prabhakaran
Dr VK Bhatia
Dr PS Rana
Shri SD Wahi

Scientist (Sr. Scale)

Shri Indra Singh

Scientist

Dr. Amrit Kumar Paul
Shri Himadri Ghosh
Dr. A Rama Krishan Rao
Md. Wasi Alam

Division of Forecasting Techniques

Dr. Ranjana Agarwal, *Principal Scientist & Head*

Principal Scientist

Dr Chandrahas
Smt Asha Saksena

Scientists (SG)

Shri SS Walia
Shri SC Mehta
Shri T Rai

Scientist (Sr Sccale)

Shri Madan Mohan
Dr Lal Mohan Bhar

Scientist

Dr Ramasubramanian V
Shri Amrender Kumar

Division of Econometrics

Dr. AK Srivastava,
Joint Director & Head

Principal Scientist

Dr RK Pandey

Sr. Scientist

Dr SP Bhardwaj
Dr SS Kutaula
Dr. Ashok Kumar

Scientist (Sr. Scale)

Smt Sushila Kaul
Shri Mahinder Singh Kaushik

Scientist

Shri Parveen Arya
Shri Sanjeev Panwar
Sh Sivaramane N.
Dr. Dharam Raj Singh

Division of Computer Application

Dr PK Malhotra,
Principal Scientist and Head

Principal Scientist

Dr RC Goyal
Dr IC Sethi
Dr VK Mahajan
Shri KC Gupta

Sr. Scientist

Dr Anil Rai, *Scientist (SG)*

Dr RK Jain
Shri OP Khanduri
Shri HS Sikarwar
Shri HO Aggarwal
Shri Balbir Singh

Scientists

Shri VH Gupta
Ms Alka Arora
Ms Sonali Das
Ms Shashi Dahiya
Shri Mohmmad Samir Faroqui
Ms Sangeeta Ahuja
Shri Sudeep Kumar
Shri Saurabh Parkash
Shri Pal Singh
Shri Krishan Kumar Chaturvedi
Shri Vipin Kumar Dubey
Ms Anshu Dixit
Shri Shahnawazul Islam
Smt. Anu Sharma

Training Administration Cell

Dr. AK Srivastava, Joint Director
Dr VK Sharma, Professor (Ag. Stat.)
Dr. PK Malhotra, Professor (CA)

Research Coordination and Management Unit

Dr. AK Srivastava, Joint Director
Dr. DK Agarwal, Principal Scientist
-in-Charge

Library

Dr. SS Srivastava
Head (T9)

Administration

Shri Chironji Lal, Chief Administrative Officer
Shri HK Samadar, Finance & Accounts Officer

CHAPTER -19

ANY OTHER RELEVANT INFORMATION SUCH AS SPECIAL INFRASTRUCTURAL/ DEVELOPMENT

Joint Staff Council

The Institute has a Joint Staff Council (IJSC) to promote harmonious relations and secure the best means of co-operation between the Council/IASRI as employer and the general body of its employees in matters of common concern for ensuring a high degree of efficiency in the service.

The Joint Staff Council of the Institute was reconstituted for the period of three years w.e.f. March 27, 2001 as under:

Prof. SD Sharma	Director	Chairman
Official-side Representatives		
1.Dr AK Srivastava	Joint Director	Member
2.Dr VK Gupta	Principal Scientist & HD(DE)	Member
3.Sh RS Khatri	Principal Scientist	Member
4.Dr LM Bhar	Scientist (SS)	Member
5.Sh. Chironji Lal	CAO	Member-Secretary (Official Side)
6.Sh HK Samadar	F&AO (Ex-Officio)	Member
Staff-side Represetnatives		
7.Sh DPS Man	Assistant	Secretary
8.Sh KB Sharma	UDC	Member
9.Sh Ghasi Ram	Technical Officer (T-5)	Member
10.Sh RK Saini	Technical Officer (T-5)	Member
11.Sh Jarnail Singh	Field Investigator (T-4)	Member
12.Sh Ram Paras	S.S. Gr. III	Member
13.Sh Raj Pal Singh	S.S. Gr.II	Member

Five Meetings of the Institute Joint Staff Council were held on April 28, May 31, September 07, December 07, 2001 and January 5, 2002 respectively under the chairmanship of Prof SD Sharma, Director of the Institute to resolve various matters for the benefit of IASRI staff.

IASRI EMPLOYEE CO-OPERATIVE THREFT AND CREDIT SOCIETY

The society is registered with Registrar Co-operative societies, Delhi Administration, Delhi carried its activities in the similar manner as during the past years by advancing regular and emergent loan to the member of the society and looked after the welfare of the members. The main sources of funds of the society as Share money (value of each share of Rs. 50/-) , compulsory deposit (Rs. 100/- pm from each member) and fixed deposit. The present strength of members are 467.

Management Committee for 2001-2002

S.No.	Name	Post
1.	Sh DC Pant	President
2.	Sh SK Sublania	Vice-President
3.	Sh RS Tomar	Secretary
4.	Sh Pramod Kumar	Treasurer
5.	Sh anil Agarwal	Internal Auditor
6.	Sh Arbind Kumar	Member
7.	Sh Manoj Kumar	Member
8.	Sh AK Gupta	Member
9.	Sh NP Singh	Member
10.	Smt Kanta Behl	Member
11.	Smt Pushpa Bareja	Member
12.	Sh VK Mishra	Ex-officio
13.	Sh UC Bandooni	Ex-officio

Main achievement of the Society

- During the period 2001-2002 society advanced Rs. 6433200 to the member as loan
- An amount of Rs. 751/- was given as gift to the each 17 members on their retirement from the Institute
- The financial help was extended from the member welfare fund to the following members :
  1. Sh Rattan Singh (Rs. 5000/-)
  2. Smt Sushila (Rs. 5000/-)
  3. Sh Munshi Ram (Rs.5000/-)
  4. Sh Ram Kumar (Rs. 2000/-)
- During this financial year 66 members were benefit by refunding 50% CD from their CD Amount

Other features

- Any members of the society can apply for regular loan up to Rs. 35,000/
- subject to 10 times of the share money or 10 times of basic pay of the members which ever is less.
- Maximum loan limit is Rs. 35,000/1 (Regular loan + Emergent loan)
- Emergent loan maximum Rs. 5,000/
- Any members who has completed 5 years can apply for 5-% CD refund from his/her CD Account.

NATP Cell

NATP Cell was constituted in the Institute to streamline the coordination and monitoring of the NATP sponsored sub projects. The following are the members of the Cell:

(i) Dr SD Sharma, Director, IASRI
(ii) Dr PK Malhotra, HD(CA) and Nodal Officer
(iii) Sh VH Gupta, Scientist

(iv) Sh Pradeep Kumar, Sr Clerk
(v) Sh Sunil Bhatia, T-1
(vi) Smt Shakuntala Arora, Sr Stenographer

Activities undertaken by the NATP Cell during 2001-02

- Assisted in the recruitment of Research Associates and Senior Research Fellows under NATP Sub-Projects
- Remittance of funds to Cooperating Centres received at IASRI as a lead center of various projects.
- Maintained the expenditure register of NATP sub projects. Quarterly/Half Yearly and Annual Expenditure statements are prepared in consultation with the Accounts Section.
- Information regarding statement of expenditure, equipments procured during the financial year and other information were supplied as and when required by the NATP/ICAR
- Various workshops/meetings were organised under the NATP sub-projects
- Assisted the Audit Party for auditing of the accounts of NATP sub-projects
- Correspondence with the other sections/cells in the Institute, cooperating centres of the projects and PIU, NATP

Grievance Committee

The Grievance Committee of the Institute (constituted as per ICAR rules) provides the employees a forum to ventilate their grievances relating to official matters and for taking remedial measures. The Grievance Committee of the Institute was reconstituted with the approval of the Management Committee of the Institute for a period of two years w.e.f. Aug. 30, 2001 as follows:

Official-side Representative	
1. Prof SD Sharma	Chairman
2. Dr VK Gupta	Member
3. Sh Chironji Lal	Member
4. Sh HK Samadar	Member
5. Sh DN Bhatia	Member
Staff-side Representative	
6. Sh Mahendar Singh	Member
7. Sh Satya Pal Singh	Member
8. Sh Chander Ballabh	Member
9. Sh Purshotam Sharma	Member

Ten meetings of the Grievance Committee of the Institute were held on Apr 30, June 02, June 29, July 19, Sept. 29, Oct 30, Nov 22, 2001 and Jan 5, Feb 22, Mar 27, 2002 under the chairmanship of the Director.

Women Cell

A Women Cell has been set up at the Institute on Jan 27, 2000. The Cell functions for the Welfare of women in General. It caters to the issues grievances pertaining to the women employees. Women Cell consists of the following members:

1. Chief Administrative Officer Chairman
2. Smt Cini Verghese, Scientist , Member
3. Smt Meena Nanda, Technical Officer, Member
4. Smt Pushpa Bareja, Assistant, Member
5. Smt Usha Sood, SS Gr. I, Member
6. Smt Seeta Malhotra, Asstt. Admn. Officer, Convener

Hostel Activities:

There are two well furnished hostels viz. Panse Hostel and Sukhatme Hostel to cater the residential requirements of the trainees and students of M.Sc., Ph.D. courses and Senior Certificate Courses (SCC) at the Institute within its premises. Officers and other trainees of the various other refresher, short-term and ad-hoc courses organised at the Institute are also provided residential accommodation at the Panse Hostel (Guest House). Ample facilities exists for the cultural activities and sports for the hostel inmates. Hostel mess is run by the students on co-operative basis. The general management of the hostels is vested with the Warden, who is assisted by the Prefect and the other students. The main activities included are as follows:

A General Body meeting of IASRI hostel inmates was held under the Chairmanship of Shri RS Khatri, Warden. For smooth functioning of the hostel activities, the following executive committee members were elected for the sessions 2001-2002.

1. Sh K.P. Chandran, Prefect
2. Sh Subrata Kr. Satpati, Assistant Porefect/Mess Secretary
3. Sh Dinesh Kr. Pateria, Sports Secretary
4. Sh Ajeet Kumar, Computer Secretary
5. Sh Praveen Krishna, Chief Auditor
6. Sh Shalendra Tripathi, Maintenance Secretary
7. Sh Rama Krishna Singh, Health & Sanitation Secretary

On the eve of the annual day on July 2, 2001, a sports week was organised by IASRI in Sukhatme Hostel where students at IASRI including girls participated in various sports like table-tennis, badminton etc. Several other sport events like table-tennis and tug-of-war were also organised between faculty members and students.

Boarding and lodging arrangements were made in Panse Hostel (Guest House) for the participants of various training programmes organised at the Institute. Similar arrangements were made for the guests who stayed in guest house from different departments/organisations.

Benevolent Fund

The employees of the Institute have constituted a Benevolent Fund from their own contributions to provide relief to the families of the employees who die in harness and are left in an indigent condition and a gift of Rs.500/- is being given to the retiring employees of the Institute. During the year, a sum of Rs. On 31st March, 2002, an amount of Rs 8559/- only was as balance in the account. This year, gifts of Rs. 11,000 were distributed to 22 retiring personnel of the Institute @ of Rs. 500/- each. A relief of Rs. 1,000/- each was provided to the families of three IASRI personnel i.e. Sh Ratan Singh, SS Grade-IV, Sh Munshi Ram, SS Grade-III and Smt. Sheela, SS Gr.-I on their untimely death. 11, 148/- only was collected from members as well as donation received.

Co-operative Store

The cooperative store registered with the Registrar, Cooperative Societies, Delhi Administration, Delhi continued to be run for the benefit of the staff members of the Institute. Cold drinks, coffee, snacks provisions and general merchandise etc. were made available at reasonable rates to the staff members of the Institute.

Member's Children Education Welfare Scheme was introduced by the Managing Committee during the year 1997-98 for the promotion of educational improvement for the children of the members of the cooperative store. Under the scheme 50 children of the members of the cooperative store were benefited so far.

At present, office bearer of the Co-operative Store are as follows:

1.	Shri SK Mahajan	President
2.	Dr. SS Srivastava	Vice-President
3.	Shri SC Agarwal	Secretary
4.	Shri NK Sharma	Treasurer
5.	Shri Asha Ram Sharma	Member
6.	Shri DN Bhatia	Member
7.	Shri KB Sharma	Member
8.	Shri Mohan Lal	Member
9.	Shri Vinod Kumar Mishra	Member
10.	Ms Vijay Bindal	Member
11.	Mrs Harsh Kapoor	Member

The total membership of the cooperative store as on 31st March, 2002 was 406.

Recreation and Welfare Club

The Institute has a Recreation and Welfare Club which provides facilities for indoor and outdoor games, promotes social and friendly relations among the members and general recreation and welfare of its members. The club organises sport tournaments annually at Institute level for different games/events e.g. Table Tennis, Carrom, Volleyball, Card games etc. The sport tournaments for the year 2001 were organised during 2001-2002.

The prize distribution function of the Recreation and Wlefare Club was held on July 2, 2001 on the Annual Day function of the Institute. Sh Ram Bhool, Sr Clerk was adjudged the Best Sportsman of the Year 2000-2001.

Following is the Executive

Committee of R&W Club:

1.	Prof. SD Sharma	President
2.	Dr. KK Tyagi	Vice-President
3.	Sh. Santosh Kumar	Secretary
4.	Sh. Ram Bhool	Sports Secretary
5.	Sh. KK Hans	Treasurer
6.	Sh. Mohan Lal	Member
7.	Sh. Naresh Kumar	Member
8.	Sh. Pradeep Kumar	Member
9.	Sh. Diwan Singh	Member

Sports Activities

- During Nov. 05-07, 2001, Sh. S.K. Upadhayay as Captain, Dr. K.K. Tyagi and Sh. G.M. Pathak, as members of Institute Table Tennis team participated in the ICAR Zone-IV Sports Meet organized by CIRB, Hissar and was instrumental in winning runners-up position for the Institute.
- Dr. K.K. Tyagi acted as Chairman-sub-committee- Table Tennis and assisted in the organising of ICAR Inter-Zone Sports Meet held at IARI, New Delhi during Feb 27-March 3, 2002.

राजभाषा

अध्याय-20

भारतीय कृषि सांख्यिकी अनुसंधान संस्थान में राजभाषा के बढ़ते चरण

भारतीय कृषि सांख्यिकी अनुसंधान संस्थान में वर्ष-दर-वर्ष हिन्दी के प्रयोग में चौमुखी अभिवृद्धि हो रही है । प्रतिवेदनाधीन अवधि में संस्थान की राजभाषा कार्यान्वयन समिति की बैठकें नियमित रूप से आयोजित की गई । इन बैठकों में अध्यक्ष महोदय ने महत्वपूर्ण एवं कारगर निर्णय तो लिए ही साथ ही उनके कार्यान्वयन में भी व्यक्तिगत रूचि ली जिसके फलस्वरूप संस्थान में इस वर्ष संस्थान के दैनिक काम-काज में हिन्दी का प्रगामी प्रयोग कुल मिलाकर 54.5 प्रतिशत रहा जो अपने आप में एक उल्लेखनीय उपलब्धि है ।

इस वर्ष प्रशासनिक अनुभागों में तो हिन्दी का प्रयोग आशानुकूल रहा ही साथ ही वैज्ञानिक प्रभागों में भी हिन्दी के प्रयोग में उल्लेखनीय वृद्धि हुई है । यहां यह उल्लेख करना उचित होगा कि संस्थान के प्रतिदर्श सर्वेक्षण एवं संगणक अनुप्रयोग प्रभाग के कुछ प्रशिक्षण एवं परियोजना संबंधी कार्यों में लगभग 85 प्रतिशत हिन्दी और मिलीजुली भाषाओं का प्रयोग हुआ । जबकि गत वर्ष नगण्य था । दोनों ही प्रभागों से जो आंकड़े मिले हैं उन पर नजर डाली जाए तो संगणक अनुप्रयोग प्रभाग में लगभग 25 प्रशिक्षण कार्यक्रमों में प्रशिक्षण देते समय अनुदेशकों द्वारा 70 प्रतिशत से अधिक हिन्दी माध्यम का सहारा लिया । ये प्रशिक्षण कार्यक्रम अधिकतर भारतीय कृषि अनुसंधान परिषद के संस्थानों और राज्य कृषि विश्वविद्यालयों में काम कर रहे अधिकारियों और कर्मचारियों के लिए चलाए गए । इसी प्रकार प्रतिदर्श सर्वेक्षण प्रभाग से जो सूचना मिली है यदि उस पर नजर डाली जाए तो आप देखेंगे कि इस प्रभाग द्वारा 22-25 अगस्त, 2001 तक एक प्रशिक्षण कार्यक्रम चलाया गया जिसका विषय था- "फलों व सब्जियों के क्षेत्रफल व पैदावार के आकलन संबंधी प्रतिदर्श सर्वेक्षण" इसका समस्त कार्यक्रम, यहां तक कि व्याख्यान भी विशुद्ध रूप से हिन्दी में ही दिए गए । इसी प्रभाग द्वारा कृषि मंत्रालय द्वारा वित्तीय सहायता प्राप्त एक परियोजना नामतः प्रत्येक कृषि जलवायु क्षेत्र / राज्य के दीर्घकालीन यांत्रिकीकरण की नीति तैयार करने के लिए अध्ययन के लिए क्षेत्रीय कर्मचारियों को जारी की जाने वाली अनुसूची और उसमें दिए गए निर्देश अंग्रेजी के साथ-साथ हिन्दी में तैयार किए गए । इसी परियोजना में क्षेत्रीय आंकड़े एकत्रित करने के लिए क्षेत्रीय आन्वेशकों को जो तीन दिवसीय प्रशिक्षण दिया गया वह भी पूरी तरह से हिन्दी में दिया गया । इसके अलावा प्रभाग के वैज्ञानिकों द्वारा लोकप्रिय लेख भी हिन्दी में लिखे गए । संस्थान के प्रत्येक प्रभागों द्वारा उनके यहां आयोजित की जाने वाली प्रभागीय अनुसंधान समिति की बैठको के कार्यवृत अंग्रेजी के साथ-साथ हिन्दी में भी जारी किए गए हैं तथा आयोजित किये जाने वाले विभिन्न प्रशिक्षण कार्यक्रम के बैनर द्विभाषी में तैयार किये गये हैं । संस्थान में हिन्दी अनुभाग द्वारा नियमित रूप से प्रतिदिन लिखे जाने वाले "आज का शब्द" 15 दिन के अन्तराल पर क्रमशः वैज्ञानिक, तकनीकी एवं प्रशासनिक शब्द लिखे गये है । राजभाषा विभाग, गृह मंत्रालय द्वारा जारी वार्षिक कार्यक्रम के अनुसार संस्थान में 7 अनुभागों को अपना कार्य शत-प्रतिशत हिन्दी में करने के लिए विनिर्दिष्ट किया जाना है। इस समय संस्थान

में शत-प्रतिशत अपना काम हिन्दी में करने के लिए 8 अनुभाग विनिर्दिष्ट किया जा चुका हैं जो कि निर्धरित लक्ष्य से एक अनुभाग अधिक है ।

संस्थान के वैज्ञानिकों को मूल लेखन हिन्दी में लिखने के लिए प्रोत्साहित एवं जागरूकता पैदा करने के लिए वैज्ञानिकों के लिए दिनांक 20-22 दिसम्बर, 2001 तक तीन दिवसीय कार्यशाला तीन दिवसीय हिन्दी कार्यशाला का आयोजन किया गया जिसमें वैज्ञानिकों सहभागियों को "हिन्दी में वैज्ञानिक विषयों पर मूल लेखन कैसे लिखें", भारतीय कृषि अनुसंधान परिषद द्वारा हिन्दी सबसे अधिक कार्य करने वाले संस्थान को दिये जाने वाले "राजर्षि टण्डन योजना पुरस्कार", हिन्दी में काम करने की संवैधनिक अनिवार्यता, राजभाषा नियम एवं अधिनियम की जानकारी दी । इसी प्रकार प्रशासनिक अधिकारियों, तकनीकी अधिकारियों/कर्मचारियों तथा अवर श्रेणी लिपिकों एवं उच्च श्रेणी लिपिकों के लिए भी हिन्दी कार्यशाला का आयोजन किया गया जिसमें उन्हें संस्थान में राजभाषा हिन्दी के प्रयोग में और वृद्धि लाने के लिए नियम, अधिनियम, संवैधानिक अनिवार्यता के विषय मे बताया । एक विशेष निर्णय के तहत हिन्दी टंकण में प्रशिक्षित आशुलिपिकों, सहायकों, उच्च श्रेणी लिपिकों एवं अवर श्रेणी लिपिकों को हिन्दी में टंकण कार्य स्वयं करने के लिए हिन्दी अनुभाग द्वारा चार-चार कर्मचारियों की बैच बनाकर 15 दिवसीय हिन्दी टंकण का प्रशिक्षण कार्यक्रम कम्प्यूटर पर दिया गया । परिणाम स्वरूप प्रशिक्षित कर्मचारी अपने-अपने हिन्दी टंकण में निपुणता से कार्य कर रहे है । संस्थान में वैज्ञानिक पद पर काम कार्यरत 3 वैज्ञानिकों - सर्वश्री डॉ. अमृत कुमार पॉल, डॉ. रामासुब्रामनियन. वी., श्री हिमाद्री घोष एवं अवर श्रेणी लिपिक पद पर कार्यरत श्री रोरेल संग पायटे को हिन्दी का कार्यसाधक ज्ञान नहीं था जिन्हें अपेक्षित ज्ञान प्राप्त करने लिए भेजा गया था । जिसमें से 2 वैज्ञानिक सर्वश्री डॉ. सुब्रामनियन वी. एवं डॉ. अमृत कुमार पॉल ने अंतिम परीक्षा (प्राज्ञ) क्रमषः 70 एवं 81.5 प्रतिशत अंक से उत्तीर्ण कर प्रथम पुरस्कार प्राप्त किया । इसके अलावा हिन्दी आशुलिपि में प्रशिक्षण के लिए तीन आशुलिपिकों को प्रशिक्षण के लिए भेजा गया जिसमें से 2 आशुलिपिक श्री महेश चन्द्र एवं श्रीमती सुषमा निगम ने परीक्षा उत्तीर्ण कर ली है । दैनिक प्रयोग में आने वाली सामान्य टिप्पणियों की सूची बनाकर प्रत्येक प्रभाग /अनुभाग /एकक /कक्ष में वितरित किया गया जिसका लाभ अधिकारी एवं कर्मचारी उठा रहे हैं ।

भारतीय कृषि सांख्यिकी अनुसंधान संस्थान में हर वर्ष की भांति इस वर्ष भी चेतनामास का आयोजन किया गया । यह आयोजन हिन्दी दिवस के सुअवसर पर किया गया और इस पूरे महीने के दौरान संस्थान में अनेक प्रतियोगिताएं की गई । दिनांक 14 सितम्बर, 2001 के दिन डॉ दरोगा सिंह स्मारक व्याख्यानमाला का आयोजन किया गया । इस व्याख्यानमाला का दसवॉ व्याख्यान डॉ दयानाथ झा, पूर्व निदेशक एनकेप एवं राष्ट्रीय प्रोपफेसर द्वारा दिया गया उनके व्याख्यान का विषय था- कृषि अनुसंधान एवं प्रबंधन में नई चुनौतियाँ । हिन्दी दिवस के अवसर पर भारतीय कृषि सांख्यिकी अनुसंधान संस्थान की वेबसाइट हिन्दी में भी शुरू की गई जिसका उद्घाटन एन.ए.टी.पी. के राष्ट्रीय निदेशक डॉ. पी. एल. गौतम द्वारा किया गया । इसके साथ ही हमारा संस्थान समूची भारतीय कृषि अनुसंधान प्रणाली का एक ऐसा अग्रज संस्थान बन गया है जिसकी बेबसाइट अंग्रेजी के साथ-साथ हिन्दी में भी उपलब्ध है। हिन्दी वैबसाईट खोलने के लिए http:/iasri.delhi.nic.in/hindex.html क्लिक करें ।

चेतनामास के दौरान आयोजित किए गए विभिन्न कार्यक्रमों में से तीन आकर्षक एवं लोकप्रिय कार्यक्रम थे - प्रश्न-मंच, अन्ताक्षरी तथा काव्यपाठ । तीनों ही कार्यक्रम संस्थान के सभी कर्मियों के लिए आकर्षण का केन्द्र रहे और सभी ने इन कार्यक्रमों का पूरी तरह से आनंद उठाया ।

इन कार्यक्रमों के अलावा चेतना मास के दौरान किए गए अन्य कार्यक्रम थे :

1. वाद - विवाद
2. निबंध लेखन
3. टिप्पण एवं प्ररूप लेखन
4. हिन्दी व्यवहार प्रतियोगिता (व्यक्तिगत एवं सामूहिक)

संस्थान में इस वर्ष के दौरान हिन्दी अनुभाग के कर्मचारियों ने दो बार सम्पर्क अभियान चलाया जिसके तहत हिन्दी अनुभाग के कर्मचारी संस्थान के विभिन्न प्रभागों/अनुभागों में व्यक्तिगत रूप से प्रत्येक व्यक्ति की सीट पर जाकर उनकी समस्याओं का तत्काल समाधान किया ताकि संस्थान में हिन्दी के प्रचार-प्रसार को गति मिल सके । इस कार्यक्रम के कारण अधिकाशतः अधिकारी /कर्मचारी अंग्रेजी की अपेक्षा राजभाषा हिन्दी को अपने प्रयोग में लाये है । इसके अलावा संस्थान की उप निरीक्षण समिति ने भी इस वर्ष संस्थान के विभिन्न प्रभागों/अनुभागों का दौरा किया और वहां पर हो रहे हिन्दी के काम का मूल्यांकन किया । निरीक्षण के बाद निरीक्षण समिति ने संस्थान में हिन्दी के प्रयोग में अभिवृद्धि के लिए सिफारिशें की । इन सिफारिशों को संस्थान में कार्यान्वित करने के लिए निदेशक महोदय ने जरूरी आदेश पारित किए जिनके फलस्वरूप संस्थान में हिन्दी के व्यवहार में आशातीत वृद्धि हुई है ।

इस वर्ष हिन्दी अनुभाग द्वारा विभिन्न प्रभागों से प्राप्त अनेक लोकप्रिय लेख, रिपोर्ट, साराशों, परियोजना अनुसूचियों एवं मार्ग निर्दशों का अनुवाद तो किया ही गया साथ ही संस्थान के समाचार पत्र का भी अनुवाद एवं टंकण किया गया । संस्थान की वार्षिक रिपोर्ट को अनुवाद एवं टंकित कर प्रकाशनार्थ आर.सी.एम.यू. को भेजा गया ।

इस प्रकार आप देखेंगे कि भारतीय कृषि सांख्यिकी अनुसंधान संस्थान में राजभाषा हिन्दी के प्रयोग में आशातीत वृद्धि हुई है ।

अध्याय -21

विशिष्ट सारांश

भारतीय कृषि सांख्यिकी अनुसंधान संस्थान (भा.कृ.अ.प.) की स्थापना सन 1959 में कृषि सांख्यिकी अनुसंधान संस्थान के रूप में हुई थी और तभी से यह संस्थान कृषि सांख्यिकी में अनुसंधान को बढावा दे रहा है और शिक्षा/प्रशिक्षण प्रदान करने का अपना महत्वपूर्ण दायित्व निभा रहा है । सूचना प्रौद्योगिकी के क्षेत्र में हो रही उन्नति के साथ-साथ इस संस्थान ने स्वयं को कृषि अनुसंधान की वर्तमान जरूरतों के अनुकूल बनाया है । आज इस बदले हुए परिवेश में संस्थान को सौंपे गए कार्य हैं- कृषि सांख्यिकी में मौलिक, व्यावहारिक और अनुकूल अनुसंधान करना, राष्ट्रीय कृषि सांख्यिकीय प्रणाली को विकसित करने एवं सुदृढ़ बनाने में सहायता करना, कृषि सांख्यिकी एवं कम्प्यूटर उपयोग में स्नातकोत्तर और सेवाकालीन पाठयक्रम चलाना, परामर्श सेवाएं प्रदान करना, कृषि सांख्यिकी में सूचना भण्डार के रूप में कार्य करना, कृषि सांख्यिकी और कंप्यूटर उपयोग में एक उन्नत और श्रेष्ठ शिक्षा एवं प्रशिक्षण केन्द्र के रूप में संस्थान को विकसित करना और भा.कृ.अ.प. के संस्थानों एवं राज्य कृषि विश्वविद्यालयों, राज्य कृषि/ पशुपालन विभागों के साथ सम्पर्क करना तथा इन विषयों में राष्ट्रीय एवं अन्तर्राष्ट्रीय संगठनों के प्रायोजित अनुसंधान करना और प्रशिक्षण प्रदान करना ।

संस्थान के विभिन्न प्रभागों, जैसे प्रतिदर्श सर्वेक्षण, परीक्षण अभिकल्पना, जैव-सांख्यिकी, पूर्वानुमान तकनीक, अर्थमिति और कम्प्यूटर अनुप्रयोग में अनेक अनुसंधान परियोजनाएं चलाई जातीं हैं। प्रतिवेदनाधीन वर्ष के दौरान 48 अनुसंधान परियोजनाएं चलाई जा रही हैं, जिनमें से 12 संस्थान आधारित हैं, 14 राष्ट्रीय कृषि अनुसंधान प्रणाली के तहत अन्य संस्थानों के सहयोग से चल रही हैं, 10 परियोजनाओं को ए.पी. सैस फण्ड से वित्तीय सहायता प्राप्त हो रही है, 3 परियोजनाएं बाह्य सहायता प्राप्त हैं, 7 एन.ए.टी.पी. की हैं, 1 रिवॉल्विंग फण्ड और 1 सी.ए.एस. परियोजना है। संस्थान में जिन परियोजनाओं पर विशेष बल दिया गया, वे हैं - सूदुर संवेदी और भौगोलिक सूचना प्रणाली, फसल प्रणाली अनुसंधन, कृषि एवं पशु परीक्षणों के लिए सूचना प्रणाली, पशु, कृषि वानिकी और मत्स्य अनुसंधान के लिए परीक्षण अभिकल्पना, कम्प्यूटर अनुकार अध्ययन और बूटस्ट्रैप, जैकनिफ, कृषि सांख्यिकी में संतुलित पुनरावर्तित पुनरावृति, जैसी पुनः प्रतिचयन तकनीकों को लागू करना, जीन क्रिया पर अध्ययन, आनुवंशिक प्राचलों और आनुवंशिक गुणों का आकलन, आनुवंशिक प्रगति एवं अन्य संबंधित सांख्यिकीय गतिविध्यिां, जैविक, परिस्थितिकीय और आर्थिक प्रक्रिया की अरैखिक सांख्यिकीय मॉडलिंग, कृषि प्रणाली में पूर्वानुमान तकनीक, कृषि में प्रौद्योगिकी संबंधी बदलाव, कृषि में जोखिम और अनिश्चितता, खाद्य सुरक्षा, कृषि बाजार की मॉडलिंग, राष्ट्रीय कृषि अनुसंधान प्रणाली (एन.ए.आर.एस.) के लिए आंकड़ों का आधर और सूचना प्रणाली तैयार करना ।

प्रतिदर्श सर्वेक्षण प्रभाग, आमतौर पर, फसल, पशुपालन, मात्स्यिकी और दूसरे संबंधित क्षेत्रों के विभिन्न प्राचलों का आकलन करने के लिए प्रतिदर्श सर्वेक्षण की तकनीको का विकास करने का महति दायित्व निभाता है । इस प्रभाग द्वारा, (i) सुदर संवेदन एवं

भूगोलिक सूचना प्रणाली, (ii) मूल्यांकन एवं मानांकन अध्ययन, (iii) उत्पादन और क्षेत्र का आकलन और (iv) उत्पादन लागत अध्ययन जैसे विशेष प्रबलित क्षेत्रों पर आठ अनुसंधान परियोजनाएं चलाई गई। राष्ट्रीय कृषि अनुसंधान प्रणाली के संस्थानों, राज्य कृषि विभागों आर्थिक एवं सांख्यिकीय निदेशालय, पशुपालन एवं डेरी विभाग, कृषि मंत्रालय; केन्द्रीय सांख्यिकी संगठन और राष्ट्रीय प्रतिदर्श सर्वेक्षण संगठन इत्यादि द्वारा इन अनुसंधन परियोजनाओं के साथ-साथ परामर्श सेवाओं का भरपूर लाभ उठाया जाता है ।

''कटाई के समय और कटाई के बाद हुई क्षति का मूल्यांकन'' नामक एक एन.ए.टी.पी. की मिशन मोड परियोजना शुरू की गई है । इस अध्ययन का मुख्य उद्देश्य, उत्पादक, उपभोक्ता और बाजर के स्तर पर, दूध, मात्स्यिकी, तिलहन, ऊन, मांस और कुक्कुट पालन जैसी जिंसों को हुई हानि का मूल्यांकन करना है ।

भारतीय कृषि अनुसंधान परिषद के ए. पी. सेस फण्ड में ''ऊन उत्पादन का आकलन'' आंकड़ों की उभरती हुई जरूरतों और मूल्यांकन की एक पद्धति नामक एक नई परियोजना सी. एस.डब्लू.आर.आई. अविकानगर, के सहयोग से शुरू की गई । जिसके उद्देश्य थे- नस्ल के अनुसार भेड़ों की संख्या, औसत ऊन उत्पादन, ऊन का कुल उत्पादन एवं जिला स्तर पर मौसम संबंधी बदलाव का आकलन लगाने के लिए मौजूदा प्रतिचयन पद्धति को संशोधित करना, के साथ-साथ अलग-अलग क्षेत्रों में भेड़ पालन की भिन्न-भिन्न प्रक्रियाओं का अध्ययन भी करना है।

''जहाज से उर्वरकों के प्रतिनिधि नमूने चुनने के लिए प्रतिचयन प्रक्रिया'' नामक एक अध्ययन किया गया । यह अध्ययन ए.पी. सेस फण्ड से वित्तीय सहायता प्राप्त था । गुण्वत्ता पर नियंत्रण रखने के लिए उर्वरकों के प्रतिनिधी नमूनों का चुनाव करने के लिए एक उपयुक्त प्रतिचयन पद्धति सुझाई गई है । डाई अमोनियम फासफेट (डी.ए.पी.) म्यूरेट ऑफ पोटास (एम.ओ.पी.) उर्वरकों में नमी की मात्रा और कणों के आकार निर्धारित करने के लिए नमूने के जरूरी आकार सुझाए गए हैं ।

करनाल जिले में गेहूं की फसल पर ''किसानों द्वारा लगाए गए अनुमान की सहायता से ब्लॉक स्तर पर फसल उपज के आकलन'' नामक एक लघु अध्ययन पूरा हो गया है । फसल कटाई के आकलन के साथ-साथ किसानों द्वारा लगाए गए फसल की उपज के अनुमानों की सापेक्ष सटीकता की भी जांच की गई है । फसल कटाई आकलकों और किसानों द्वारा लगाए गए अनुमानों की सहायता से दोहरे प्रतिचयन समाश्रयण आकलकों के रूप में औसत उपज के ब्लॉक स्तर पर उपयुक्त आकलक सुझाए गए हैं ।

राष्ट्रीय कृषि बीमा योजना के लिए जरूरी एक लघु क्षेत्रीय फसल आकलक पद्धति सुझाई गई है । कृषि मंत्रालय द्वारा भिन्न-भिन्न राज्यों में मार्गदर्शी आधर पर इस पद्धति को अपनाया गया है ।

कृषि मंत्रालय भारत सरकार नई सहस्त्राब्दि के उदय काल में भारतीय किसानों की आर्थिक दशाओं का पता लगाने के लिए ''भारतीय किसान की दशा-एक सहस्त्राब्दि अध्ययन'' नामक एक अध्ययन चलाया जा रहा है । इस अध्ययन के एक अंग के रूप में ''प्रबंध कृषि के लिए सूचना सहायता'' नामक एक स्टेटस लेख्र तैयार किया जा रहा है ।

एरैट्रिया से आए प्रतिभागियों के लिए खाद्य एवं कृषि संगठन द्वारा प्रायोजित एक अंतर्राष्ट्रीय प्रशिक्षण कार्यक्रम चलाया गया। प्रभाग ने ''फलों और सब्जियों के क्षेत्र एवं उत्पादन का आकलन के लिए प्रतिदर्श सर्वेक्षण'' पर एक प्रशिक्षण कार्यक्रम चलाया । संयुक्त

राष्ट्र के खाद्य एवं कृषि संगठन एशिया एवं पैसिफिक के संयुक्त राष्ट्र सांख्यिकी संस्थान द्वारा संयुक्त रूप से "कृषि के लिए आर्थिक लेखा" पर एक कार्यशाला चलाई गई। "पद्धतियां एक नजर में" पर एक खण्ड तैयार किया गया है । एन.ए.टी.पी. मिशन मोड परियोजना के तहत एन.ए.टी.पी. की एक प्रयोगशाला शुरू करने के लिए प्रभाग में बुनियादी ढांचा विकसित किया गया है ।

प्रभाग, सन् 1996 से कृषि अनुसंधन डाटा पुस्तिका के प्रकाशन का काम कर रहा है । इस श्रृंखला की पांचवीं कड़ी-"कृषि अनुसंधान डाटा पुस्तिका 2001" प्रकाशित हो चुकी है और इसकी प्रतियां राष्ट्रीय कृषि अनुसंधान तंत्र में कार्यरत सदस्यों में वितरित कर दी गयी हैं । कृषि अनुसंधान डाटा पुस्तिका- 2002 तैयार की जा चुकी है ।

परीक्षण अभिकल्पना का मुख्य जोर कृषि एवं पशु विज्ञान के क्षेत्र में खेतों और प्रयोगशालाओं में किये जाने वाले परीक्षणों से संबंधित आंकड़ों का विश्लेषण करने के लिए सांख्यिकी अभिकल्पनाओं और पद्धतियों का विकास करने पर है। प्रभाग के वैज्ञानिकों ने 15 अनुसंधान परियोजनाओं पर काम किया है । इन परियोजनाओं के प्रबलित क्षेत्र हैं- (i) फसल प्रणाली अनुसंधान, (ii) कृषि एवं पशु परीक्षणों की सूचना प्रणाली और (iii) कृषि, पशु, कृषि वानिकी और मात्स्यिकी अनुसंधान। इन परियोजनाओं के अलावा प्रभाग के वैज्ञानिक संस्थान की दूसरी परियोजनाओं में भी काम कर रहे हैं ।

अखिल भारतीय समन्वित अनुसंधान परियोजना के तहत चल रही भिन्न-भिन्न सहयोगी परियोजनाओं के मिले आंकड़ों का विश्लेषण समुचित सांख्यिकी तकनीकों की सहायता से किया गया । इन परियोजनाओं की वार्षिक रिपोर्ट उनकी संबंधित सहयोगी एजेंसियों द्वारा प्रकाशित करवाई गई है । दीर्घकालीन उर्वरक परीक्षणों (2001) पर अखिल भारतीय समन्वित अनुसंधान परियोजना के तहत किये गये परीक्षणों से संबंधित आंकड़ों का नियोजन, डिजाइनिंग और सांख्यिकीय विश्लेषण नामक एक स्टैटस रिपोर्ट तैयार कर प्रकाशित करवाई गई । एस. टी.सी.आर. पर अखिल भारतीय समन्वित अनुसंधान परियोजना के तहत किये गये परीक्षणों की डिजाइंनिग और विश्लेषण पर एक स्टैटस पेपर भी तैयार किया गया।

इस प्रभाग द्वारा कृषि के क्षेत्र में ऊर्जा की जरूरत का आकलन लगाने के लिए/ उसे दर्शाने के लिए एक रैखिक प्रोग्रामिंग विधि का भी विकास किया गया है । इस विधि का इस्तेमाल उन स्थितियों में उपज को अधिकाधिक करने के लिए किया जाता है जब मानव श्रम, पशु श्रम, डीजल, बिजली, बीज दर, कच्ची खाद, उर्वरक, रासायनिक /मशीनरी, सम्पूर्ण ऊर्जा इत्यादि जैसे भिन्न-भिन्न स्रोतों से प्राप्त होने वाली ऊर्जा की उपलब्धता पर दबाव हो । एक दी हुई उपज के स्तर को प्राप्त करने के लिए सम्पूर्ण ऊर्जा को कम करने के उद्देश्य से भी इस प्रक्रिया को इस्तेमाल में लाया जाता है । ऊर्जा के उपयोग की दक्षता की अवधारणा को भी शामिल किया गया है । इस तकनीक का इस्तेमाल कृषि क्षेत्र में उर्जा की जरूरत पर अखिल भारतीय समन्वित अनुसंधान परियोजना, सी.आई.ए.ई., भोपाल द्वारा किया जा रहा है ।

प्रभाग के दो वैज्ञानिकों को वर्ष 1999-2000 के लिए "युवा वैज्ञानिक पुरस्कार" से सम्मानित किया गया जिनमें से एक को यह पुरस्कार राष्ट्रीय कृषि विज्ञान अकादमी से और दूसरे को भा.कृ.अ.प. से, भारतीय विज्ञान कांग्रेस के 89वें सत्र में "मिनिमल बैलैन्स्ड रिपीटेड मेजरमेंट डिजाईन्स नामक लेख को श्रेष्ठ पोस्टर प्रस्तुतीकरण पुरस्कार के लिए चुना गया ।

जैव सांख्यिकीय प्रभाग के कंधों पर जैव सांख्यिकी और सांख्यिकीय आनुवंशिक के क्षेत्र

में अनुप्रयुक्त और मौलिक अनुसंधान करने की महति जिम्मेवारी है । प्रभाग के वैज्ञानिकों ने 6 अनुसंधान परियोजनाओं पर काम किया जिनके प्रबलित क्षेत्र हैं- (i) पुनः प्रतिचयन तकनीकों का कम्प्यूटर अनुकरण अध्ययन करना और उन्हें लागू करना, (ii) जीन क्रिया, आनुवंशिक प्राचलों का आकलन और आनुवंशिक गुण इत्यादि पर अध्ययन करना और (iii) जैविक और पारिस्थितिक प्रक्रिया की अरैखिक सांख्यिकीय मॉडलिंग । उप-कार्यक्रम (i) में दो परियोजनाएं चल रही हैं, यानि (क) उपज और स्थायित्व के एक साथ जीन प्ररूप चुनने के लिए सांख्यिकीय पद्धति का विकास । यह परियोजना एक अन्तः संस्थानीय परियोजना है जो भा.कृ.अ.सं., नई दिल्ली के सहयोग से चल रही है (ख) पहाड़ी और लवण प्रभावित मिट्टी वाले क्षेत्रों में बड़े खेतों की विचरणशीलता का सांख्यिकीय विश्लेषण करने के लिए दत्त संसाधन तकनीको का अध्ययन, यह परियोजना अन्तः संस्थानीय है जो परीक्षण अभिकल्पना प्रभाग के सहयोग से चल रही है और ए.पी सैस निधि से सहायता प्राप्त है । उप कार्यक्रम (ii) में तीन परियोजनाएं चल रही हैं - (क) वंशागतित्व के रॉबस्ट आकलनों पर (ख) वंशागतित्व के आकलकों पर नियत प्रभावों के असर पर आनुभविक अन्वेषण और; (ग) भारतीय नस्ल की भेड़ों में स्वस्थता संबंधी विशेषकों की वंशागतित्व की बढ़वार पद्धति और वंशागतित्व पर अध्ययन। उप कार्यक्रम (iii) में एक परियोजना चल रही है - "कृषि में अरैखिक काल श्रेणि मॉडलिंग का अध्ययन"। प्रभाग के एक वैज्ञानिक ने आई.एस.ए.एस. युवा वैज्ञानिक पुरस्कार-2001 प्राप्त किया ।

भारतीय कृषि अनुसंधान परिषद के विभिन्न संस्थानों और राज्य कृषि विश्वविद्यालयों में काम कर रहे अनुसंधान सांख्यिकीविदों, और अन्य विषयों के संकाय सदस्यों के बीच परस्पर सम्पर्क की महत्ता को ध्यान में रखते हुए, उच्च अध्ययन केन्द्र के तहत "कृषि अनुसंधान के लिए जैव सांख्यिकी विधियां" पर एक प्रशिक्षण कार्यक्रम चलाया गया । इस कार्यक्रम के जरिए विचारों के आदान-प्रदान के अवसर तो मिले ही साथ ही वर्तमान समस्याओं पर विचार-विमर्श भी हुआ और कृषि में आंकड़ों के विश्लेषण करने के लिए उपयोगी सांख्यिकी एवं संगणन औजारों के साथ-साथ जैव सांख्यिकी में हुई नवीनतम उन्नतियों पर प्रतिभागियों एवं वक्ताओं ने आपस में विचार-विमर्श किया ।

पूर्वानुमान तकनीक प्रभाग द्वारा नौ अनुसंधान परियोजनाओं पर काम किया गया, इन परियोजनाओं में, कृषि प्रणाली में पूर्वानुमान तकनीक पर विशेष बल दिया गया है । "सस्य जलवायवीय सूचियों पर आधरित बारानी फसलों की पूर्व चेतावनी और उपज मूल्याकंन मॉड्लों का विकास" नामक परियोजना की रिपोर्ट को अन्तिम रूप दिया जा चुका है । यह अध्ययन रायपुर (म.प्र.) में चावल, दिल्ली और परभनी (महाराष्ट्र) में ज्वार (सोरगम), और दिल्ली में मक्का की बारानी फसलों के लिए किया गया है । साप्ताहिक वर्षा वृष्टि और विगत 23 वर्षों के पैन वाष्पन संबंधी आंकड़ों और तदनुरूप जिलों के उपज संबंधी आंकड़ों का इस्तेमाल किया गया । हर वर्ष इसकी जीवन चक्र के दौरान फसल के साप्ताहिक दवाबों का आकलन करने के लिए जल संतुलन तकनीक इस्तेमाल में लाई गई । बढ़वार के भिन्न-भिन्न अवस्थाओं में पड़ने वाले दबावों के समुचित भारों का निर्धरण किया गया और संचयित भारित दबाव सूचियां तैयार की गई जिनका इस्तेमाल समय रहते पूर्वानुमान मॉडल विकसित करने के लिए किया गया । इन मॉडलों ने, ज्वार की फसल का पूर्वानुमान कटाई से 6 सप्ताह, मक्का के 4 सप्ताह और चावल के 5 सप्ताह पूर्व पूर्वानुमान मुहैया कराए । मॉडलों को वैधीकृत किया गया । परिणामों से पता चलता है कि चावल की फसल पर इस तकनीक का इस्तेमाल करने से पहले इसे परिष्कृत करने की जरूरत है ।

एक दूसरी परियोजना जो "तालाबों से मिलने

वाले मत्स्य उत्पादन का पूर्वानुमान" नामक परियोजना पूरी हो चुकी है और परियोजना की रिपोर्ट बाहरी रैफरी के पास प्रस्तुत की जा चुकी है । इस अध्ययन में, दो प्रकार के मॉडलों का विकास किया गया-एक बहु-समाश्रयण मॉडल और दूसरा अरैखिक मॉडल । बहु-समाश्रयण मॉडल में मछली का भार मछली पकड़ने से पहले स्वतंत्र चर के रूप में लिया गया और भिन्न-भिन्न सह-कारकों (को-फैक्टर्स) जैसे चभ्मान, घुली हुई ऑक्सीजन इत्यादि । जो ख्रास महीने में नापे गए थे, को स्वतंत्र चरों (पूर्वानुमान के समय पर निर्भर) के रूप में लिया गया । ख्रास महीने में मछली का लिया गया भार भी स्वतंत्र चरों में से किसी एक के रूप में लिया गया । चरणानुसार समाश्रयण के जरिए मॉडलों को संयोजित किया गया । अरैखिक मॉडलों को संयोजित करने के परिणाम अत्यन्त ही आशाजनक थे । प्रसरण की स्व-सहसंबंधा वाली विषमविचालिता की अवधारणा में अभूतपूर्व सुधार हुआ । इन मॉडलों से किए गए पूर्वानुमान बहुत ही अच्छे थे ।

इसके अलावा, "ख्रस्पतवार के कारण उपज को होने वाली हानि का पूर्वानुमान" (भा.कृ.अ.सं. के सहयोग से), "आम और धन के नाशी पीड़कों और नाशी कीटकों के पूर्व चेतावनी का विकास" (सी.आई.एच.एय. लखनऊ एवं एन.डी.यू.ए.टी. फैजाबाद) और एक सैस फण्ड की परियोजना जिसका नाम "ब्यूटिया मोनोस्पर्मा से ब्रूड-लॉक की पैदावार का पूर्वानुमान लगाने के लिए मार्गदर्शी सर्वेक्षण" (आई.एल.आर.आई. रांची के सहयोग से) पर परियोजनाओं, अध्ययनों का काम चल रहा है । "बहु मार्कोव चैन की सहायता से पूर्वानुमान मॉडल का विकास" सम्बन्धी काम भी चल रहा है ।

"फसल के नाशीपीड़कों और रोगों की पूर्व चेतावनी पर आधारित मौसम का विकास" नामक एन.ए.टी.पी. के तहत मिशन मोड परियोजना में प्रभाग ने सहयोग किया । परियोजना इस उद्देश्य से चलाई गई कि चावल, गन्ना, अरहर, कपास, सरसों और मूंगफली की नाशीपड़कों और रोगों के पूर्व चेतावनी प्रणाली पर आधरित मौसम विकसित किये जा सके ।

अर्थमितीय प्रभाग द्वारा 4 अनुसंधान परियोजनाओं पर काम किया गया जिनमें शामिल किए गए प्रबलित क्षेत्र हैं- (i) कृषि में प्रौद्योगिकीय बदलावों, जोखिमों एवं अनिश्चितताओं का अध्ययन, (ii) ख्राद्य सुरक्षा का अध्ययन, और (iii) कृषि विपणन की मॉडलिंग करना। अण्डा उत्पादन में प्रौद्योगिकीय दोहराव का अर्थमितीय अध्ययन नामक परियोजना पशुपालन विभाग, पंजाब सरकार के सहयोग से चल रही है । आदिवासी, पिछड़े और पहाड़ी क्षेत्रों में परिवार और पोषक ख्राद्य सुरक्षा नामक एक दूसरी ऐसी परियोजना है जो एन.ए.टी.पी. द्वारा वित्त पोषित है। प्रतिवेदनाधीन अवधि के दौरान पंजाब में चावल-गेहूं प्रणाली की तकनीकी कुशलता के विश्लेषण ओर "भारत में लाख्र के बाजार का अध्ययन" एक-एक परियोजना शुरू की गई । प्रभाग द्वारा "उत्पादन अर्थशास्त्र में परिमाणात्मक तकनीक" नामक एक समर स्कूल चलाया गया ।

एक वैज्ञानिक ने अमेरीकन बॉयोग्राफिकल संस्थान और इसके बोर्ड ऑफ इन्टरनेश्नल रिसर्च, नार्थ कॉरोलीना, यू.एस.ए. से "वर्ष 2001 की महिला" का सम्मान प्राप्त किया ।

कम्प्यूटर अनुप्रयोग प्रभाग द्वारा सात अनुसंधान परियोजनाओ पर काम किया गया है जिनके प्रबलित क्षेत्र हैं - (i) राष्ट्रीय कृषि अनुसंधान प्रणाली के लिए आंकड़ों के आधर और सूचना प्रणाल का विकास करना और (ii) सूचना प्रौद्योगिकी में स्नातकोत्तर अध्यापन और तदर्थ प्रशिक्षण पाठ्यक्रम चलाना । एन.ए.टी.पी. परियोजना के तहत "समाज विज्ञानियों की अनुसंधान प्राथमिकताएं निर्धारित करना, उनकी निगरानी करना और उनका मूल्याकंन करना तथा नेटवर्क तैयार करने के काम का संस्थानीकरण करना" नामक परियोजना की निगरानी और

मूल्यांकन के लिए मार्गनिर्देशों को अंतिम रूप दिया जा चुका है । परियोजना सूचना और प्रबन्ध प्रणाली जिसमें एम. एवं सी.ई. माड्यूल हैं, को एन.ए.टी.पी. उप परियोजनाओं को विभिन्न स्थानों पर लागू किया गया है । परियोजना सूचना एवं प्रबन्ध प्रणाली द्वारा एन. ए.टी.पी. कार्यक्रम के तहत चल रही परियोजनाओं की सूचना मुहैया की जाती है और जिसका इस्तेमाल अनुसंधान परियोजनाओं की निगरानी और मूल्यांकन के लिए किया जा सकता है । कृषि सांख्यिकविदों की वैबसाइट शुरू की गई है । भारत में कृषि शिक्षा पर राष्ट्रीय सूचना प्रणाली के लिए, ऑन लाईन सिस्टम आधारित एन.आई.एस.ए. जी.ई.एन.ई.टी. एक वैब का डिजाइन तैयार किया गया है और इसे विकसित किया जा रहा है । एन.ए.टी.पी. की मिशन मोड और भारतीय कृषि सांख्यिकी अनुसंधान नई दिल्ली में केन्द्रीय डाटा वेयरहाउस के विकास के सम्बन्ध में समेकित राष्ट्रीय कृषि अनुसंधान सूचना प्रणाली (आई.एन.ए.आर.आई.एस.) शुरू की गई है । प्रभाग द्वारा 24 प्रशिक्षण कार्यक्रम चलाए गए जिसमें से 23 प्रशिक्षण कार्यक्रम रिवॉल्विंग फण्ड योजना के अन्तर्गत थे, एक प्रशिक्षण कार्यक्रम सी.एस. के तहत चलाया गया । इस प्रभाग द्वारा कम्प्यूटर सेवाएं सतत् रूप से मुहैया की जा रही है और संस्थान की संगणन सुविधाएं सुदृढ़ बनाई जा रही है ।

अनुसंधान समन्वय एवं प्रबन्ध समिति (आर.सी.एम.यू.) द्वारा संस्थान की वैज्ञानिक उपलब्धियों के प्रलेखन तैयार किये जाते हैं और उन्हें प्रचारित किया जाता है । इस एकक द्वारा पंजाब कृषि विश्वविद्यालय, लुधियाना में कृषि अनुसंधान सांख्यिकीविदों का एक तेरहवां राष्ट्रीय सम्मेलन आयोजित किया गया और संस्थान की एस.आर.सी., आर.ए.सी., क्यू.आर. टी. और वरिष्ट अधिकारियों की बैठकों का आयोजन भी किया गया । इस एकक द्वारा किये गये अन्य क्रियाकलाप हैं-नौवीं योजना के प्रस्ताव, भा.कृ.अ.प., मुख्यालय और इसके संस्थानों, राज्य कृषि विश्वविद्यालयों और भारत में स्थित दूसरे संगठनों तथा समय समय पर विदेशों के साथ पत्रचार, वार्षिक रिपोर्ट एवं समाचार पत्र का प्रकाशन, एस.आर.सी. में विचार करने से पूर्व नये अनुसंधान परियोजना प्रस्तावों की जांच करना और छःमाही निगरानी प्रगति रिपोर्ट प्रकाशित करना, वार्षिक कार्य योजना तैयार करना तथा गतिविधियां की उपलब्धियां तैयार करना भी इस एकक का एक महत्वपूर्ण काम है। ई.एफ.सी. मैमों तैयार करने के साथ-साथ अनुसंधान परियोजना सम्बन्धी फाइलों का रख-रखाव तथा ए.आर.आई.सी. (भा.कृ.अ.प.) के समक्ष प्रस्तुत करना । इस एकक द्वारा छाया चित्र एवं रिप्रोग्राफिक सेवाओं में मदद करना ।

प्रशिक्षण प्रशासन कक्ष (टी.ए.सी.), पी.जी. स्कूल, भा.कृ.अ.सं. के सहयोग से संस्थान में समस्त स्नातकोत्तर अध्यापन एवं प्रशिक्षण कार्यक्रमों के लिए, कृषि सांख्यिकी एवं संगणक उपयोग तथा प्रशिक्षण पाठ्यक्रम के विशिष्ट विषयों में तदर्थ प्रशिक्षण पाठ्यक्रम और कृषि सांख्यिकी एवं संगणक उपयोग में उच्च अध्ययन केन्द्र के तत्वाधान में प्रशिक्षण पाठ्यक्रम के नियोजन, आयोजन एवं समन्वय के लिए उत्तरदायी है ।

संस्थान के वैज्ञानिकों द्वारा कृषि सांख्यिकी और कंप्यूटर उपयोग के विषय से संबंधित अनेक कार्यशालाओं, सेमीनारों, ग्रीष्म संस्थानों में सहभागिता की गई । संस्थान के वैज्ञानिकों ने विभिन्न अध्ययनों से प्राप्त परिणामों का विशेष उल्लेख करते हुए अनेक शोध-पत्र प्रकाशित करवाए हैं । भिन्न-भिन्न संगठनों/ राष्ट्रीय कृषि अनुसंधान प्रणाली(एन.ए.आर.एस.) को परामर्श सेवाएं प्रदान की हैं ।

Advisors / Directors

Dr. PV Sukhatme	Sep.1940-Jul. 1951
Dr. VG Panse	Aug.1951-Mar.1966
Dr. GR Seth	Apr.1966-Oct.1969
Dr. Daroga Singh	Nov.1969-May.1971
Dr.MN Das (A)	Jun.1971-Oct.1973
Dr. Daroga Singh	Nov.1973-Sep.1981
Dr.Prem Narain	Oct.1981-Feb.1992
Dr. S.K.Raheja(A)	Feb.1992-Nov.1992
Dr. R.K.Pandey(A)	Dec.1992-May.1994
Dr. PN Bhat (A)	Jun.1994-Aug.1994
Dr. OP Kathuria	Aug.1994-May.1995
Dr.RK Pandey(A)	Jun.1995-Jan.1996
Dr. Bal BPS Goel	Jun.1996-Oct.1997
Dr.SD Sharma	Oct.1997-onwards