

A Curriculum for Training on Agricultural and Rural Statistics

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Training Needs in Agricultural/Rural Statistics

- **Quality of Agricultural Statistics** relies on
 - Accuracy
 - Relevance
 - Timeliness
 - Comparability
 - Availability and
 - Accessibility
- All the above dimensions need the **competence and knowledge** of statistical tools
- Hence, **capacity building** and **training** of the personnel authorized for data collection and analysis is imperative

Background Information

- Information on various attributes of the trainees is must before finalization of any training programme
- Number of persons to be trained
- Background knowledge of persons
- Level of trainees
- Duration of training
- Aptitude to acquire knowledge
- Availability of financial resources

About Training Provider

- Competent and qualified faculty
- Reputation and recognition of institution
- Well equipped laboratories with computing facilities
- Upto date and enriched library
- Capable of imparting field training
- Modern class rooms fitted with audio visual gadgets
- Good seminar hall and other infrastructures
- Standard accommodation facilities
- Capable of organizing customized programmes
- Facilities for e-learning

Proposed Curriculum - Agricultural & Rural Statistics

Curriculum in Agricultural (and Rural) Statistics for training programme of **two/three** weeks duration (**1 day = 5 lectures**)

Modules -1: Overview of Sample Survey

- Fundamental of survey sampling (including basic concepts)
- Planning & organization of sample surveys (including schedule preparation for survey data collection)
- An overview of various sampling schemes
 - **Introduction to different sampling schemes** (including simple random sampling, stratified, systematic, cluster sampling, probability proportional to size sampling, multistage and multiphase sampling)
 - **Estimation procedures under different sampling designs**
- Sample selection procedures (e.g., random number selection etc)
- Determination of sample size
- Sampling techniques for large scale surveys
- Non- sampling errors and data quality
- Non-response in surveys

Modules-2: Overview of Statistical Software and Survey Packages

- Overview of SPSS
- Overview of R software
- Overview of SAS
- Survey data analysis using MSEXCEL, SPSS, R and SAS
- Analysis of survey data (Practical exercises using real survey data/case studies: agricultural surveys)
- Impact of survey design on survey estimation

Modules-3: Agriculture Statistics System, Data Collection & Quality

- System of collection of crop statistics including land use and area statistics
- Agriculture Census and Surveys
- Collection of Horticultural statistics
- Collection of Animal husbandry, forestry and fisheries statistics etc
- Recent initiatives in collection of agricultural statistics
- Quality issues in compilation of crop statistics

- General crop estimation surveys
- Crop cutting experiments
- Demonstration of crop cutting experiments on a Farmers's Field
- Field Training for filling of schedule

Modules: Horticultural Statistics

- Overview of Horticultural Statistics (including concept and definition:, Fruits and vegetables, agricultural year, annual crops , garden, season, unit of observation etc)
- Area and yield estimation of **Fruits**
 - **Estimation of area under cultivation and production of a single fruit crop** (Sampling design, Sample size, Estimation of area under cultivation, Estimation of overall average yield per tree, Estimation of total production, etc)
 - **Estimation of area under cultivation and production of more than one fruit crop** (Sampling design, Sample size, Estimation

of area under cultivation, Estimation of overall average yield per tree, Estimation of total production, etc)

- Methodology for estimation of area and production of **Vegetable** crops
- Crop-cutting experiment
- Schedule and instruction manual
- Field visit

Area and yield estimation of flowers, spices, aromatic and medicinal plants etc

International practices and procedures on data reporting on horticulture crops: Different countries report their annual crops in different ways, many of them being unable to conform with FAO

Modules: Animal Husbandry

- Livestock survey and Census
- Use of integrated sample survey for estimation of major animal product (India)
- Integrated sample survey methodology
 - **Sampling design for data collection** (milk, egg, meat, wool production and other allied items)
 - **Estimation procedures** (milk, egg, meat, wool production and other allied items)
- Preparation of Schedule and Instruction Manual
- Field Visit
 - Complete Enumeration for frame, random selection of clusters of households for detailed survey
 - Filling of Schedule

Similar **modules** for other related surveys, e.g., **Fisheries etc**

Modules: Forestry Statistics

- Forest Statistics—what for?
- Basic of Forestry terminologies
 - **Quantitative Characteristics of Forest Stands** (Stand Density, Site Quality, Growth and Yield Models etc)
 - **Sampling**—measurement variables
- Sample survey methodology
 - **Sampling design for data collection**
 - **Estimation procedures**
- Preparation of Schedule and Instruction Manual
- Field Visit

Modules-4: Alternative Approaches-Crop Forecasting/Estimation

- Basics of remote sensing
- Introduction to geographic information system (GIS)
- Use of remote sensing for generation of agricultural statistics
- Techniques involving remote sensing and GIS and their application in agricultural surveys (case studies/pilot surveys)
- Use of remote sensing, agro-meteorology and econometric modelling for forecasting agricultural parameters (e.g., FASAL scheme in India)
- Weather based pre-harvest crop forecasting
- Area frame surveys
- Computer Assisted Personal Interview (CAPI)

Modules-5: Recent Advancements in Survey Estimation

- Small area estimation techniques
 - **Overview small area estimation** (Need, Problem, various approaches for small area estimation techniques)
 - **Application of small area estimation in agricultural survey data to produce micro level estimates** (application to real data, models and small area estimate diagnostics)
- Calibration and other recent survey estimation techniques
- Variance estimation including re-sampling methods
- Model based estimation including spatial and time series models
- Regression and logistic model for survey data
- Addressing the problems of Nonresponse, Missing data etc

Indian Agricultural Statistics Research Institute (IASRI)

- Short Term Certificate Courses
- Long Term Courses Leading to M.Sc/ Ph.D. degrees
- Customized, Demand Driven and Tailor Made Courses
- Designing of Different Training for Various Levels
- Advanced Level Courses on Specialized Topics like
 - Small Area Estimation
 - Remote Sensing and GIS
- Regular Summer/ Winter Schools on Specific Areas
- E-Learning and E-Courses

National/ International Training Programmes

- Programmes under Centre of Advanced Faculty Training
- Summer/Winter Schools in Agricultural Statistics and Computer Applications
- Customized Training Programmes (on request from CSO, AHD, Forestry Council etc)
- International Training Programmes (FAO, AARDO, CGIAR, ICARDA, CIMMYAT, and for many African, Asian and Latin American countries)

Some Recently Organised International Trainings at IASRI

- International Training programme on **Techniques of Estimation and Forecasting of Crop Production in India**, sponsored by the Food and Agriculture Organization **(for the officials of CSA, Ethiopia)**
- International Training programme on **Agricultural Statistics System and Food Security Policy Analysis in India**, sponsored by the Food and Agriculture Organization **(for the Govt. Officials of DPR, Korea)**
- International Training programme on Sampling Techniques and Survey Methods, sponsored by the Sri Lanka Government **(CSO, Sri Lanka)**
- International Training programme on **Remote Sensing and GIS in Agricultural Surveys** sponsored by Afro-Asian Rural Development Organization (AARDO)

THANK YOU