

## Curriculum Vitae of KAJAL DIHIDAR

1. **Name:** KAJAL DIHIDAR
2. **Date of birth:** 18th February, 1964.
3. **Sex:** Female.
4. **Marital Status:** Married.
5. **Nationality:** Indian.
6. **Present position and address:**

Assistant Professor.

Sampling and Official Statistics Unit.

Indian Statistical Institute.

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### 7. Professional experience:

Assistant Professor, Sampling and Official Statistics Unit, Indian Statistical Institute, February 1, 2013 - onwards.

Senior Editorial Assistant, Sankhya Office, Indian Statistical Institute, October 7, 2010 - Dec 2012.

Associate Scientist A, Applied Statistics Unit, Indian Statistical Institute, Nov, 2005 - January, 2013.

Scientific Assistant B, Applied Statistics Unit, Indian Statistical Institute, May 30, 1997 - Oct, 2005.

Project Linked Programmer, Applied Statistics Unit, Indian Statistical Institute, Oct, 1995 - May 29, 1997.

Project Linked Junior Technical Assistant, Applied Statistics Unit, Indian Statistical Institute, Jan, 1993 - Sept, 1995.

Project Linked Senior Technical Assistant, Applied Statistics Unit, Indian Statistical Institute, Sept, 1989 - Dec, 1992.

Project Assistant, Applied Statistics Unit, Indian Statistical Institute, Jan, 1988 - Sept, 1989.

### 8. Educational qualification:

Ph.D. in Statistics, Indian Statistical Institute, 2010.

Thesis title: Sampling 'Survey Populations' - Some Problems and Their Solutions.

Name of the Supervisor: Professor Mausumi Bose, Applied Statistics Unit, Indian Statistical Institute.

M.Stat., Indian Statistical Institute, 1987.

B.Sc. (Mathematics Honours), Presidency College, University of Calcutta, 1984.

## 9. Research publications:

### Publications in peer-reviewed journals and books:

- (1) Bose, M. and **Dihidar, K.** (2018). Privacy protection measures for randomized response surveys on stigmatizing continuous variables. To appear in *Journal of Applied Statistics*. Online version is available at DOI: 10.1080/02664763.2018.1440540
- (2) Pal, S. and **Dihidar, K.** (2017). On a Procedure of Estimation of Data-Dispersion Matrix under Complex Spatial Structure Prevalent in Field Experiments. *Rashi*. **2(2)**, 23-28.
- (3) **Dihidar, K.** (2017). Privacy protection in estimating sensitive population proportion by hypergeometric randomized response model. *Rashi*. **2(2)**, 07-18.
- (4) Pal, S., **Dihidar, K.**, Mandal, G., Basak, S., Ghosh, A., Chakraborty, A.K. and Pal, S. (2017). A novel approach in robust estimation of optimum size of plots. *International Journal of Agricultural and Statistical Sciences*. **13(2)**, 423-429.
- (5) **Dihidar, K.** and Bhattacharya, M. (2017). Estimating sensitive population proportion using a combination of binomial and hypergeometric randomized responses by direct and inverse mechanism. *Statistics in Transition, new series*. **18(2)** , 193-210.
- (6) Pal, S., **Dihidar, K.**, Pal, S., Basak, S., Ghosh, A. and Mandal, G. (2017). A revisit to the determination of robust optimum plot size. *Asian Academic Research Journal of Multidisciplinary*. **4(5)**, 61-73.
- (7) **Dihidar, K.** and Basu, L. (2017). Privacy Protection in Estimating Sensitive Population Proportion by a Modified Unrelated Question Model. *Statistics and Applications*. **15(1 and 2)** , New Series, 19-25.
- (8) **Dihidar, K.** (2016). Estimating Sensitive Population Proportion by Generating Randomized Response Following Direct and Inverse Hypergeometric Distribution. *Chapter 26 (pages: 427 - 441) in Handbook of Statistics, vol 34 : Data Gathering, Analysis and Protection of Privacy Through Randomized Response Techniques: Qualitative and Quantitative Human Traits*. Edited by Arijit Chaudhuri, Tasos C. Christofides and C.R. Rao. Elsevier, North Holland, Amsterdam, The Netherlands.
- (9) Pal, S., Mandal, G. and **Dihidar, K.** (2015). Determination of robust optimum plot size and shape - a model-based approach. *Biometrical Letters*. **52(1)**, 13-22.
- (10) **Dihidar, K.** (2015). On the comparison of some randomized response techniques under unequal probability sampling and super-population modelling. *Model Assisted Statistics and Applications*. **10**, 299-307.
- (11) **Dihidar, K.** (2015). Simultaneous estimation of several survey population parameters in complex surveys by Bayesian and classical methods. *Model Assisted Statistics and Applications*. **10**, 163-173.
- (12) **Dihidar, K.** (2014). Estimating population mean with missing data in unequal probability sampling. *Statistics in Transition*. New Series, Summer 2014. **15(3)**, 369-388.
- (13) Chaudhuri, A. and **Dihidar, K.** (2014). Generating randomized response by inverse mechanism. *Model Assisted Statistics and Applications*. **9**, 343-351.
- (14) Mukherjee, D., Mitra, S., **Dihidar, K.**, Mukherjee, A., Talukdar, P., and Poddar, M. (2013). Community vs. individual targeting in CSR projects: A case study in West Bengal. *Productivity*. **54 (3)**, 275-290.

- (15) **Dihidar, K.** and Chowdhury, J. (2013). Enhancing a randomized response model to estimate population means to sensitive questions. *Mathematical Population Studies*. **20(3)**, 123-136.
- (16) Bose, M., Chaudhuri, A., **Dihidar, K.** and Das, S. (2011). Model-cum-design based estimation of the prevalence rate of a disease in a locality using spatial smoothing. *Statistics*. **45**, 293-305.
- (17) Mukhopadhyay, S., Bhattacharya, S. and **Dihidar, K.** (2011). On Bayesian ‘Central Clustering’: Application To Landscape Classification of Western Ghats. *The Annals of Applied Statistics*. **5(3)**, 1948-1977.
- (18) Chaudhuri, A., Bose, M. and **Dihidar, K.** (2011). Estimating sensitive proportions by Warner’s randomized response technique using multiple randomized responses from distinct persons sampled. *Statistical Papers*. **52**, 111-124.
- (19) Chaudhuri, A., Bose, M. and **Dihidar, K.** (2011). Estimation of a sensitive proportion by Warner’s randomized response data through inverse sampling. *Statistical Papers*. **52**, 343-354.
- (20) **Dihidar, K.** (2011). Modifying classical randomized response techniques with provision for true response. *Calcutta Statistical Association Bulletin*. **63**, (Special 7th Triennial Proceedings Volume), 223-240.
- (21) **Dihidar, K.** (2009). On shrinkage estimation procedure combining direct and randomized responses in unrelated question model. *Journal of the Indian Society of Agricultural Statistics*, **63**, 283-296.
- (22) Chaudhuri, A. and **Dihidar, K.** (2009). Estimating means of stigmatizing qualitative and quantitative variables from discretionary responses randomized or direct. *Sankhya, Series B*, **71**, 123-136.
- (23) Chaudhuri, A., Bose, M. and **Dihidar, K.** (2009). Rao-Hartley-Cochran sampling with competitive estimators. *Calcutta Statistical Association Bulletin*. **61**, 227-242.
- (24) Ghosh, J.K., **Dihidar, K.** and Samanta, T. (2008). On different clustering of the same data set. *Advances in Statistics*. B.K. Kale Felicitation Volume, 112-119.
- (25) Chaudhuri, A., **Dihidar, K.** and Bose, M. (2006). On the feasibility of basing Horvitz & Thompson’s estimator on a sample by Rao, Hartley & Cochran’s scheme. *Communications in Statistics. Theory and Methods*. **35**, 2239-2244.
- (26) Chaudhuri, A., Bose, M. and **Dihidar, K.** (2005). Sample-size-restrictive adaptive sampling: an application in estimating localized elements. *Journal of Statistical Planning and Inference*. **134**, 254-267.
- (27) **Dihidar, K.** and Choudhury, P.P. (2004). Matrix algebraic formulae concerning some exceptional rules of two-dimensional cellular automata. *Information Sciences*. **165**, 91-101.
- (28) Chattopadhyay, P., Choudhury, P.P. and **Dihidar, K.** (1999). Characterisation of a particular hybrid transformation of two-dimensional cellular automata. *Computers & Mathematics with Applications*. **38(5-6)**, 207-216.
- (29) Khan, A.R., Choudhury, P.P., **Dihidar, K.** and Verma, R. (1999). Text compression using two-dimensional cellular automata. *Computers & Mathematics with Applications*. **37(6)**, 115-127.
- (30) Khan, A.R., Choudhury, P.P., **Dihidar, K.**, Mitra S. and Sarkar, P. (1997). VLSI architecture of a cellular automata machine. *Computers & Mathematics with Applications*. **33(5)**, 79-94.

## 10. Teaching and other academic activities:

### (a) Teaching:

#### **Courses taught in degree courses in Indian Statistical Institute :**

- i. Sample Surveys in B.Stat. 3rd year and M.Stat. 1st year courses since 2013.
- ii. Advanced Sample Surveys in M.Stat. 2nd year course in 2015-16.
- iii. Computer Applications (Data Analysis through Excel, SPSS and R software) to ISI Non-Economics JRFs in Social Sciences (Psychology, Linguistics and Sociology) since 2013.

#### **Courses taught in International Statistical Education Center (ISEC), I.S.I.:**

- i. Sample Surveys since 2010.
- ii. Data processing and statistical analyses through R software since 2006.
- iii. Various sampling methods to the participants of the special course for Officer's of National Statistical Bureau of Bhutan during April 23 to May 04, 2018.
- iv. Inferential Statistics to the participants from Afghanistan for a Special Course on Statistics in 2015.
- v. Sample Surveys to the participants from Cambodia for a Special Course on Statistics in 2013.
- vi. Statistical analysis through R software programming to the participants for Special Course on Statistics (April 2011 - June 2011, December 2007 - July 2008).

#### **Courses taught in workshops:**

- i. Course on systematic sampling, PPS sampling including Rao, Hartley and Cochran's scheme and related estimation procedure and Statistical analysis through R software programming to the participants of the program titled 'ISS Probationer's Training on Sample Survey Methodology and Estimation' held during Jan 23 - Feb 16, 2018, at SOSU, ISI, Kolkata.
- ii. Sample size determination, Scaling techniques and reliability analysis, Factor analysis, Cluster analysis and Discriminant analysis to the participants of the workshop on 'Application of Statistics in Social Sciences' held during November 06-12, 2017, at NITAP (National Institute of Technology, Arunachal Pradesh), Yupia, Arunachal Pradesh conducted by SOSU, ISI, Kolkata.
- iii. Different sampling methods, estimation procedures, sample size determination and related computational details through Excel to the participants of the workshop on 'Training of Research Personnel of Doordarshan' held during September 06-08, 2017, at ISI, Kolkata.
- iv. Introduction to R to the participants of a workshop on 'Big Data and R' held during February 02-08, 2017, at Computer Science & Engineering Department of Institute of Engineering and Management (IEM), IEM Gurukul Campus, Kolkata conducted by IEM, Kolkata.
- v. Scaling techniques and reliability analysis, Factor analysis, Cluster analysis and Discriminant analysis to the participants of the workshop on 'Application of Statistics in

Social Sciences and Official Data' held during December 05-11, 2016, at NEHU, Tura Campus, Meghalaya conducted by SOSU, ISI, Kolkata.

- vi. Course on various sampling designs and sample size determination in many other workshops conducted by SOSU, ISI.
- vii. Statistical analysis through R software programming to the participants for Training Programmes of Reserve Bank of India's Newly Appointed Officers conducted by SOSU, ISI.
- viii. Sample survey work through R software package to many workshops since 2010, including in the workshop conducted by NSSO, the training programs for ISS Probationary Officers conducted by SOSU, etc.
- ix. Course on Sampling in the workshop on 'Statistics & Sampling in Audit' held during December 16-20, 2013 at Regional Training Institute, CGO Complex, Salt Lake, Kolkata conducted by Indian Audit and Accounts Department.
- x. Overview of International Passenger Survey to the Students of Post Graduate Diploma in Statistical Methods with Applications from ISI North East Center, Tezpur, program during their Kolkata visits for several years since 2011.
- xi. Programming in C language to the participants of 'Refresher Course on Computer Applications in Statistics, Winter School' held at ASU for several times.
- xii. Analysis of Measures of Poverty and Measures of Inequality through SPSS software to the participants of a Training Programme for Government Officers on Economic Statistics held during January 28-31, 2008, conducted by E.R.U., I.S.I., Kolkata.
- xiii. Statistical analysis through SPSS and R software in several workshops held at ASU.

**(b) Master's Project supervision:**

Supervised several M.Stat.(ISI) and M.Sc.(Statistics, Kalyani Univ) in their project works. The titles of the projects are as follows.

- i. Estimating sensitive population proportion by three stage randomized forced response model. (Continuing by one M.Stat. student).
- ii. Forecasting the production of total food grains, pulses and oil seeds in India using ARIMA and ARIMAX models. (Continuing by two M.Sc.(Stat) students of Kalyani University).
- iii. Assessing the factors that affect the health status of M.Sc Second Year students of Kalyani University using Ordinal Logistic Regression analysis. Submitted in Kalyani University in the year 2017.
- iv. Analysis and protection of privacy in an application of randomized response technique. Submitted in ISI in the year 2017.
- v. Poisson regression on count data. Submitted in Kalyani University in the year 2017.
- vi. Inflation-Expectations survey of households - An exercise on variance estimation in systematic sampling scheme. Submitted in ISI in the year 2016.
- vii. Estimating Sensitive Population Proportion using a Combination of Binomial and Hypergeometric Randomized Responses by Direct and Inverse Mechanism. Submitted in ISI in the year 2016.
- viii. Estimating Sensitive Population Proportion by Generating Randomized Response following

Direct and Inverse Hypergeometric Distribution. Submitted in Kalyani University in the year 2015.

- ix. Estimating population mean with doubtful missing data and propensity score in unequal probability sampling. Submitted in ISI in the year 2013.
- x. Estimation of a quantitative sensitive mean applying Gjestvang and Singh's model through inverse sampling of respondents. Submitted in Kalyani University in the year 2012.
- xi. Estimation of sensitive proportion by Mangat & Singh (1990)'s model emphasizing on multiple randomized responses from distinct persons. Submitted in Kalyani University in the year 2012.
- xii. Enhancing a randomized response model to estimate the sensitive quantitative population mean. Submitted to KVPY in the year 2011. (This paper has been presented in 99th Science Congress, 2011 held in KIIT, Bhubaneswar by my project student Joydeep Chowdhury, M.Stat, 1st year.)
- xiii. Estimating sensitive proportions by repetitive Warner's randomized response technique. Submitted in Kalyani University in the year 2010.
- xiv. An experiment on estimating the monthly expenditure per household in West Bengal through Systematic Sampling. Submitted in Kalyani University in the year 2009.
- xv. Examining the performance of Bootstrap Method for estimation of confidence interval in comparison to  $v_1$  &  $v_2$  of Wolter (1984) in Systematic Sampling. Submitted in Kalyani University in the year 2009.

(c) **Acted as Peer-Reviewer for papers submitted in the following journals:**

- Communications in Statistics - Theory and Methods
- Communications in Statistics - Simulation and Computation
- Sankhya
- Environmental and Ecological Statistics
- Model Assisted Statistics and Applications
- Hacettepe Journal of Mathematics and Statistics
- Statistics in Transition, New Series
- Journal of Applied Statistics
- Statistics and Probability Letters
- Journal of the Society of Statistics, Computer and Applications
- Mathematical Population Studies
- Kuwait Journal of Science

(d) **Acted as Coordinator of the following workshops:**

- Workshop on Applications of Statistics in Social Sciences during November 06-12, 2017, at NITAP (National Institute of Technology, Arunachal Pradesh), Yupia, Arunachal Pradesh

conducted by SOSU, ISI, Kolkata.

- Workshop on Applications of Statistics in Social Sciences and Official Data during December 05-11, 2016 held at NEHU, Tura Campus, Meghalaya.
- Training on Sample survey work through R software package to the NSSO Officers held at NSSO, Kolkata during Nov 23-27, 2015.
- Training program on Basic Statistics for Officials dealing with Statistics in DES, Tripura held at SOSU during July 21-24, 2014.
- (Joint Coordinator) Workshop on Upgradation of Skill of Govt. Officials held in Gangtok, Sikkim during June 02-11, 2014.
- Executive Programme on Statistical Analysis for the teachers, educators of various institutions of Madhya Pradesh Government held during September 23-27, 2013 at SOSU, ISI, Kolkata

**(e) Responsibility in ISI Projects:**

Involved with the responsibility of designing the sampling and corresponding estimation procedure wherever applicable and computation in the following projects.

- i. Developing an appropriate methodology for estimating proportion of villages with specific infrastructure facility, funded by Ministry of Statistics and Programme Implementation, Govt. of India. Principal Investigator: Dr. Nachiketa Chattopadhyay.
- ii. Developing an appropriate structure preserving estimation (SPREE) method for estimating the main level aggregates for NSSO household survey, funded by Ministry of Statistics and Programme Implementation, Govt. of India. Principal Investigator: Dr. Nachiketa Chattopadhyay.
- iii. International Passenger Survey 2015-16 commissioned by Ministry of Tourism, Govt. of India. Principal Investigator: Professor Ashis Sengupta, ASU, ISI.
- iv. Methodological Study towards Compilation and Estimation of Service Trade Statistics 2015-16 commissioned by Directorate General of Commercial Intelligence and Statistics (DGCI&S), Ministry of Commerce and Industry, Govt. of India. Principal Investigator: Professor Ashis Sengupta, ASU, ISI.
- v. ISI-RBI collaboration research project funded by Reserve Bank of India, 2014-15. Principal Investigator: Dr. Diganta Mukherjee, SOSU, ISI.
- vi. Reviewing the existing system of compilation of trade indices funded by DGCI&S, Govt. of India. Principal Investigator: Dr. Nachiketa Chattopadhyay, SOSU, ISI.
- vii. Accountability of Local Governments in West Bengal: A pilot study on Gram Panchayats, Government of West Bengal funded by State Finance Commission, Govt. of West Bengal. Principal Investigator: Dr. Sandip Mitra, SOSU, ISI.
- viii. A study on Corporate Social Responsibility of IISCO, funded by IISCO(SAIL). Principal Investigator: Dr. Sandip Mitra, SOSU, ISI.
- ix. International Passenger Survey in India : 2010 - 2011 conducted by A.S.U., I.S.I. collaborated with Ministry of Tourism, Government of India. Principal Investigator: Professor Ashis Sengupta, ASU, ISI.
- x. Feedback from the Indian Statistical Institute on Consumer Confidence Survey, Rounds 1 to

- 9, conducted by Reserve Bank of India. Principal Investigator: Professor Debasis Sengupta, ASU, ISI.
- xi. Observations from the Indian Statistical Institute about Survey on Perceived Inflation conducted by Reserve Bank of India. Principal Investigator: Professor Debasis Sengupta, ASU, ISI.
  - xii. Statistical analysis of a very large scale remotely sensed data collected from Western Ghats and studying the related classification problems. Principal Investigator: Professor Tapas Samanta, ASU, ISI.
  - xiii. Analysis of Two Dimensional Cellular Automata. Principal Investigator: Professor Pabitra Pal Choudhury, ASU, ISI.
  - xiv. A study of Rural Indebtedness in West Bengal. Principal Investigator: Professor Bimal Roy, ASU, ISI.
  - xv. Differential Impact Study on Modern Rice Technology. Principal Investigator: Professor Anish Mukherjee, ASU, ISI.
  - xvi. Developing a Software Package Programme on Cluster Analysis for microcomputer. : A part of the priced software package titled 'Essential Applied Statistics for Environmentalists ( EASE )'. Principal Investigator: Professor Ajay Adhikari, ASU, ISI.

**(f) Lectures in conferences:**

- i. Title of the lecture: 'Survey Sampling and Analysis Through R Programming'. Name of the conference: One-day seminar on Computational Statistics in the Department of Statistics, Kalyani University, on March 30, 2016.
- ii. Title of the lecture: 'Estimating population mean with doubtful missing data in unequal probability sampling'. Name of the conference: 8th Triennial Calcutta Symposium on Statistics and Probability held during December 27 - 30, 2012 in the Department of Statistics, University of Calcutta.
- iii. Title of the lecture: 'Modifying classical randomized response techniques with provision for true response'. Name of the conference: 7th Triennial Calcutta Symposium on Statistics and Probability held during December 28 - 31, 2009 in the Department of Statistics, University of Calcutta.
- iv. Title of the lecture: 'Rao-Hartley-Cochran sampling with competitive estimators'. Name of the conference: 6th Triennial Calcutta Symposium on Statistics and Probability held during December 29 - 31, 2006 in the Department of Statistics, University of Calcutta.

**(g) Committee memberships :**

- i. Statistical Trainee Recruitment Committee in SOSU for several years.
- ii. Project Linked Personnel Recruitment Committee of the projects (1) Developing an appropriate methodology for estimating proportion of villages with specific infrastructure facility, and (2) Developing an appropriate structure preserving estimation (SPREE) method for estimating the main level aggregates for NSSO household survey, both of ISI.
- iii. Project Linked Personnel Recruitment Committee of Growth Curve Modeling Project of ISI for two times.



- iv. Member having all sorts of academic responsibilities in IPS and DGCI&S projects of ISI during the absence of principal investigator Prof. Ashis Sengupta.
- v. An external member in a Committee on 'Sexual harassment to women employee' in SDRD(NSSO).

**(h) Life membership of Scientific Bodies :**

- i. Life member, Calcutta Statistical Association.