

Abstract

In this thesis, ratio-type estimator, multivariate ratio-type estimator, chain ratio-ratio type estimator, chain ratio-product type estimator, classical regression estimator, difference estimator and exponential ratio-type estimators have been proposed under adaptive cluster sampling design for estimating the finite population mean by the information of one or more auxiliary variable.

In Chapter 1, conventional sampling design, use of auxiliary information and procedure of adaptive cluster sampling design has been conferred. In Chapter 2, literature about use of auxiliary information in usual sampling and research in adaptive cluster sampling plan has been discussed.

In Chapter 3, to estimate the population mean of the concerned variable some existing estimators in simple random sampling have been discussed using the information of one or two auxiliary variables. Some estimators in ACS have been conferred also. Further the notations for the population mean in SRS and ACS and equations of bias and mean square error have been developed.

In Chapter 4, major contributions of this thesis appears by proposing nine estimators using the information of one or two auxiliary variables under adaptive cluster sampling by operating the average of the average values of the networks with simple random sampling without replacement. Their Bias and MSE has been derived. Efficiency problems in adaptive cluster sampling have been discussed also. Some of the special cases of proposed estimators have been discussed also. Hypothetical comparisons of proposed estimators with proposed and existing estimators have been prepared.

In Chapter 5, two exponential ratio type estimators have been developed to estimate the mean of population of the study variable using auxiliary variable. Bias and Mean Square Error (MSE) of both estimators are derived. Special cases of these estimators are presented. Hypothetical comparisons of proposed estimators with proposed and existing estimators have been made.

In Chapter 6, generalized class of estimator have been developed using two auxiliary variables in adaptive cluster sampling. Bias and MSE of this estimator are derived and two exponential ratio

type of estimator have been discussed also as special cases of this estimator. Theoretical comparisons have been prepared also.

In Chapter 7, empirical study of proposed estimator has been consummated by computing the Bias and MSE of estimators and then demonstrates the efficiencies and precisions of these estimators by obtaining the Bias, MSE and percentage relative efficiencies.