ESTIMATING THE FINITE POPULATION MEAN AND VARIANCE USING THE KNOWN PARAMETERS OF THE AUXILIARY VARIABLE

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ABSTRACT

It is well known that sampling plays a vital role in all discipline including Physical and Chemical sciences; Biological and Environmental sciences; Economic and Social sciences; Engineering and Medical sciences whenever one has to undertake a study to understand the behavior of some entities in their respective fields. The problem in our hand is to estimate the population mean and variance on the basis of a random sample selected from the population with some desirable properties like Unbiasedness / Minimum Bias and Minimum Variance / Mean squared error. When there is no auxiliary information available, the simplest estimator of population mean and variance is the sample mean and variance obtained by using simple random sampling without replacement. Sometimes in sample surveys, along with the study variable Y, information on auxiliary variable X, which is positively correlated with Y, is also available. This information on auxiliary variable X, may be utilized to obtain a more efficient estimator of the population mean and variance. Ratio method of estimation is an attempt in this direction. In recent times a lot of attempts are made on improving or modifying the usual ratio estimator by introducing a large number of modified ratio estimators with known Coefficient of Variation, Kurtosis, Skewness, Population Correlation Coefficient, Median, Quartiles, Deciles and their linear combinations. In this talk we will discuss briefly about the developments taken place on the ratio estimator for estimating finite population mean and variance. Further the relative performances of the ratio estimator and modified ratio estimators are assessed for certain natural populations.