

SUMMARY

In real world problems it is often the case that the characteristic of principal interest to the investigator is very expensive to measure. However, another characteristics can be identified which is highly correlated with the first one and is relatively inexpensive to measure. These characteristics will be referred to as the primary, y and the auxiliary x , variables respectively. For estimating mean or total of y a single sampling plan which only uses the information of y do not yield estimator of desired precision. Then the estimator can be improved by using Two-Phase sampling plan using auxiliary characteristics. Regression estimator in Two-Phase sampling can be used efficiently to increase the precision by using additional auxiliary characteristics available during survey. In this thesis two new regression estimators have been proposed in Two-Phase sampling using additional auxiliary variable available. Brief summery of the thesis is given below.

Chapter 1 comprises of the basic definitions related to two-phase sampling and regression estimators already developed in this context. Chapter 2 provides the comprehensive review of the literature.

The new ratio-cum-regression estimator in two-phase sampling using equal probabilities is proposed in chapter 3. It's unbiased ness has been proven along with derivation of its mean square error.

In chapter 3 another regression estimator has been also proposed in, two-phase sampling using unequal probability without replacement at the first phase for the selection of initial sample and final sample is selected using simple random sampling without replacement with two auxiliary characteristics. Mathematical comparison has been also carried out. Some conditions have been derived under which regression estimator using unequal probabilities for selection of sample is always precise than corresponding regression estimator in simple random sampling suggested by Mukherjee and Rao (1987).

Empirical study for the purpose of comparison of new proposed estimators with already existing competent estimators has been carried out in chapter 4. Important references has been quoted at the end of thesis.