

ABSTRACT

Successive sampling is such kind of sampling scheme which consists of selecting sample units on different occasions such that some units are common with samples selected on previous occasions. Generally, the main objective of successive surveys is to estimate the change with a view to study the effects of the forces acting upon the population for this it is better to retain the sample from occasion to occasion. We proposed two estimators of successive sampling for the estimation of population mean over two occasions, one estimator with single auxiliary variable and the other one is with two auxiliary variables. The expression of mean square error (MSE) and bias, up-to first order of approximation have been obtained. The optimum replacement policy for both estimator haven also been discussed and the minimum optimum mean square error have been obtained. The conditions are derived under which the proposed estimators perform better, every estimator have its own limitations and assumptions so we can compare these estimators with the existing estimators of successive sampling given in the literature so we make the efficiency comparison with the standard unbiased estimator of sample mean (\bar{y}_n) and with the standard successive sampling estimator with no auxiliary information ($\hat{\bar{Y}}$). Numerical analysis with realm life examples is also carried out to confirm the efficiency comparison results. We have also developed repetitive EWMA-SS (successive sampling) control charts and control limits to monitor the process mean and also make comparison on different level of correlations (ρ) and on the different values of smoothing constant (λ)