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**DOUBLE AND RESAMPLING IN ADAPTIVE
CLUSTER SAMPLING**

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**A Dissertation Submitted in Partial
Fulfillment of the Requirements for the Degree of
Doctor of Philosophy (Statistics)
School of Applied Statistics
National Institute of Development Administration**

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ABSTRACT

Title of Dissertation	Double and Resampling in Adaptive Cluster Sampling
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In this dissertation, two topics in adaptive cluster sampling were studied.

First, an adaptive cluster double sampling with the initial sample selected by simple random sampling without replacement of units, and an adaptive cluster double sampling without replacement of networks, were studied, along with associated ratio estimators. The results of this study indicated that when the correlation between the auxiliary variable (X) and the variable of interest (Y) is very high, the relative efficiency of the proposed estimators are more efficient than the estimator of classical simple random sampling without replacement and the ratio estimator for double sampling, but it is less efficient than the classical ratio estimator. If the correlation coefficient between the auxiliary variable (X) and the variable of interest (Y) is decreased, the proposed estimators are more efficient than with simple random sampling, classical double sampling, and classical ratio estimator.

Second, group balanced repeated replication (GBRR) variance estimation in stratified adaptive cluster sampling was studied. The modified plus estimator was studied in the topic because the form of variance and estimate of variance of this estimator were complicated. The results of this study show that when we used GBRR variance estimation, the relative bias of variance was less than nine percent, and the variance of estimate variance for the GBRR method was less than the variance of the estimate variance of the modified plus estimator.

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