

**INTERNATIONAL CONFERENCE PROCEEDINGS ON
MULTIDISCIPLINARY RESEARCH ON INTEGRATING KNOWLEDGE
FOR SUSTAINABLE FUTURE IN GLOBAL OUTLOOK**

2nd October 2024

Organised By



**DMI – ST. JOHN THE BAPTIST UNIVERSITY,
MALAWI, CENTRAL AFRICA**

&



**MULTI SPECTRUM RURAL SKILL DEVELOPMENT
AND EDUCATIONAL TRUST
KANYAKUMARI, TAMILNADU, INDIA**



EDITORS

Dr. E. Joseph Rubert

Dr. Tania Sur Roy

Dr. Sanitha K K

Dr. R. Thanga Sheela

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**Development of a Chain Regression-Product Type Estimation Strategy for Population
Mean under Two-Phase Sampling**

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Abstract: In this paper we have develop a chain regression-product type estimation strategy for population mean using information available on auxiliary variable. We have studied the properties of the proposed estimator. The performance of the proposed estimator has been compared with some existing estimators of population mean and results are demonstrated using the information of natural population data set. Looking on the auspicious founding that the proposed estimator is suggested to the survey statistician for use in application of real-life problems.

Keywords: *Auxiliary variables, two-phase sampling, chain regression-product type estimator, bias, efficiency, mean square error(MSE), minimum mean square error.*

1. Introduction

In survey sampling, using auxiliary information for enhancing the efficiency of estimation of study variable is a good practice. Auxiliary variable is kind of variable which is strongly correlated (positively/negatively) to the study variable. When auxiliary variable is positively correlated with the study variable, Cochran(1940) proposed the ratio estimator to estimate the population mean or total of the study variable. When auxiliary variable is negatively correlated with the study variable, Robson (1957) proposed the product estimator to estimate the population