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IMPLICIT SMALL AREA MODELS WITH APPLICATIONS ION AGRICULTURE

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ABSTRACT

In small area estimation the question is often about the trade of between bias and variance. With small sample sizes the unbiasedness of the direct estimators may be of no practical value due to large variance of the estimator. The model-based estimators are prone to bias, but they have the advantage of small variances compared to the design-based estimators. There is evidence that the model-based small area estimators outperform the direct estimators with respect to the estimation accuracy measured with mean squared error (MSE) (Torabi and Rao, 2008). This is possibly why the model-based approach is widely accepted as the framework for small area estimation. In this paper we have obtained direct, synthetic and composite estimators on real agricultural data set and results obtained from these estimators are compared in terms of average relative bias, average squared relative bias, average absolute bias, average squared deviation as well as the empirical mean square error. It has been found that composite estimator works better than direct and synthetic estimators. The above discussed methods are illustrated practically with the help of SAS and R software on the basis of newly developed functions piest (), composite (), relativebias (), absolute bias ().

KEYWORDS: Model-Based Estimation Methods, Synthetic Estimates