**Small area composite estimators in a simulation test**

Decision makers need information for smaller areas than the National Forest Inventories can reliably provide. For instance, the Finnish National Forest Inventory produces municipality level results based on the K nearest neighbor method. These results are calculated from the field sample plots either by adjusting the sample weights with the K nearest neighbor weights, or by using post-stratification based on the predicted volume. The former approach provides a (potentially biased) indirect model-based estimate, the second an unbiased direct design-based estimate. Design-based approach is attractive, but not always feasible due to low numbers of field plots in small municipalities. Moreover, the indirect K nearest neighbor estimator is lacking an analytical estimator for the variance. A composite estimator combining the indirect model-based and direct design-based estimates could be a feasible solution. In this article, estimators for small-area estimation are analyzed in a simulation experiment with a varying size of the small areas and varying quality auxiliary data. The potential of composite estimators is assessed based on the true standard errors and RMSEs in the simulation experiment. The results show that direct estimators and composite estimators work reasonably well with varying quality models, but the performance of indirect estimators is highly dependent on the quality of a model. Linear models with limited weight for observations outside the area and K nearest neighbor model performed better than unweighted linear model. This suggests that the localization of the fixed parts of the models for the small areas is beneficial. EBLUP approach also performed well, both in connection of a K-NN model and a linear model. More research is needed to clarify how many and/or how far sample plots should be included from the outside of the domain, how the plots within and outside of the domain should be weighted, and how these choices are affected by the goodness of a model.