



Area level model approach to small or large area estimation incorporating auxiliary information.

Jae-kwang Kim*

Iowa State University, Ames, U.S.A. - jkim@iastate.edu

Zhonglei Wang*

Iowa State University, Ames, U.S.A. - wangzl@iastate.edu

Zhengyuan Zhu*

Iowa State University, Ames, U.S.A. - zhuz@iastate.edu

Combining information from different source is an important practical problem. Using hierarchial area level models, we establish a framework for combining information from different source to get improved prediction for small or large area estimation. The best prediction is obtained by the conditional expectation of the observable latent variable given all available observation. The model parameters are estimated by two-level EM algorithm. Estimation of the mean squared predicition error is discussed.

Sponsored by National Agricultural Statistical Agency (NASS) of US department of Agriculture, the proposed method was applied to the crop acrage prediction problem combining information from three sources: The first source is the June Area Survey (JAS), which is obtained by the probability sampling. The second source is from the Farm Service Agency (FSA) data, which is obtained from a voluntary participation of certain programs. The third source is from the classification of the Cropland Data Layer (CDL).

Keywords: Best prediction; Mean squared error estimation; multi-level models.