

# Area Frames for Land Cover Estimation: Improving the European LUCAS Survey

Javier Gallego. Institute for Environment and Sustainability. JRC, Ispra (Italy)  
Tel: +39.0332.785101, fax: +39.0332.789803, e-mail: [javier.gallego@jrc.it](mailto:javier.gallego@jrc.it)

LUCAS (Land Use/Cover Area frame Survey) has been launched by the European Union (EU) in 2001 based on an area frame of points with a two-stage systematic sampling. This paper gives some comparisons with other approaches: list frames and area frames of segments. We discuss some possible options to improve LUCAS:

- combining an annual survey focused on arable land with a general purpose survey every 5 years for example.
- moving to an area frame of unclustered points
- using covariables for stratification or estimation correction.

A remark is made showing that the current LUCAS two-stage sampling scheme can be seen as a single-stage systematic sampling, which simplifies the estimation of variances. The problem of variance estimation in a systematic sample with a detailed stratification is discussed.

A simulation shows that a stratification based on photo-interpretation is much more efficient with unclustered points (single stage sampling) than with the current two-stage design if the photo-interpretation is very accurate. However the efficiency gain is debatable with a moderate amount of photo-interpretation errors.