

## Sampling Design using Remote Sensing in KOREA

Pyong Namkung

*Professor, Department of Statistics, Sungkyunkwan University*

*Chongno-ku, Seoul, 110-745, Korea*

*E-mail: namkung@skku.edu*

Jong-Seok Byun

*Professor, Department of Statistics and Information, Hanshin University*

*Osan, Gyeonggi-Do 447-791, Korea*

*E-mail: jsbyun@hs.ac.kr*

Joon-Suk Lee

*Ph D., Team of Statistics, PDS Korea*

*Mapo-ku, Seoul, 121-837, Korea*

*E-mail: sampling@koreapds.com*

Chan-Soo Lim

*Ph D., candidate, Department of Statistics, Sungkyunkwan University*

*Chongno-ku, Seoul, 110-745, Korea*

*E-mail: chancetime@skku.edu*

US, EU, Japan, India and China estimate arable land and crop area using remote sensing and aerial photograph. Ministry of Environment, Korea Maritime Institute, Korea Forest Service and National Academy of Agriculture Science of Korea have used remote sensing and aerial photograph. Among them, LUCAS was estimating arable land and crop area for 2 stage sampling method in EU.

Recently, Korea uses 1 meter resolution because we have KOMPSAT-2. So, we thought that a weak point of field survey could be enhanced by sampling design using high resolution remote sensing data to estimate arable land.

Remote sensing data is two dimension grids. So, we considered what proper grid type and sampling design was. And then, arable land data of Ministry of Environment, which has 2.5 meter resolution and purpose surveying distribution of the whole nation land, was used sampling frame. Remote sensing data was used for estimation.

Therefore square grid were selected, stratified two stage cluster sampling was designed. Remote sensing data of specific city was used for estimation.

Likewise, we suggest proper sampling design of arable land estimation of specific city by comparing coefficients of variation, differences and  $\sqrt{MSE}$  s of some sampling methods.

## REFERENCES (RÉ FERENCES)

Cochran, W. G. (1997), "Sampling Techniques", 3rd edition, John Wiley & son. Inc. New York.

Elisabetta Carfagna and F. Javier Gallego (2005), "Using Remote Sensing for agricultural statistics", *International Statistical Review*, 73, 3, 389-404.

F. J Gallego (1999), "Crop Area Estimation in the Mars Project", JRC, tp. 262/21020 Ispra(Va).

F. J. Gallego. and J. Delince., (2009), "A European Approach to Area Frame Surveys", Joint Research Centre of the European Communities.

Mohammad Salehi M (2004), "Optimal sampling design under a spatial correlation model", *Journal of Statistical Planning and Inference* 118 (2004), 9-18

Pascal JACQUES, Javier GALLEGO (2006), "The LUCAS 2006 project – A new methodology", JRC-ISPRA.