Agricultural statistics: application of aerial-survey and remote-sensing techniques for 1999-2003

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The Commission presents a report which has been drawn up pursuant to Article 6 of Decision No 1445 /2000/EC and deals separately with implementation of the LUCAS project and the MARS project. It also deals with the resources used and with proposals on how areal-survey and remote-sensing techniques could continue to be used.

The LUCAS project: it is recalled that the main aim of the LUCAS project is to implement an areal-survey project at Community level in agricultural statistics. The Commission describes the activities undertaken to implement the project as well as the **main results**. The pilot surveys carried out in the Member States over the period 2001-2007 demonstrated the feasibility of this project on a Community scale. General advantages of the LUCAS survey methodology approach are: high thematic precision; high representativeness, harmonized survey approach; accurate change detection; flexible survey structure; and fast execution (up-to-date information). The data collected over the period 2001-2007 allow analysis of time series for monitoring the CAP, within the restrictions due to changes of methodology and the limited coverage of the data samples. Interactions between agriculture, the environment and the countryside can be studied by evaluating changes in land cover/land use over time and along the mapped transects, but also by analysing the environmental parameters surveyed.

The **main EU policy domains** identified on which LUCAS can contribute are land cover/land use, landscape diversity and structure, soil erosion and quality, or land management. For policy domains such as air pollution, water quality and forest monitoring, LUCAS may support the legal obligations of the Member States through data harmonisation and accessibility with relatively minor effort involved.

The available LUCAS data are potentially useful for a **range of purposes**. These include:

- gathering agricultural and environmental data: LUCAS could provide crop area estimates, independent of farm declarations, and could also be used as a sampling base for more specific surveys linked to agricultural and environmental issues. It is one of the very few identified contributors to the agri-environmental indicators on landscape and on changes in land cover. It could bridge the information gap about the presence of linear features and landscape diversity all over Europe. It is a unique source of information for modelling erosion risk, for surveying irrigation use and map landscape elements and for other environmental variables;

- providing data for landscape analysis: LUCAS provides data for long-term monitoring of agricultural and environmental issues on a European scale;

- linking the data with Earth observation projects: LUCAS is expected to be one of the main “in situ” data providers needed for GMES (Global monitoring for environment and security). In situdata at EU-27 level to support satellite research are required for the space work programme under the 7th R&D Framework Programme.

The Commission indicates that the strength of the LUCAS survey is based upon providing data for combined agricultural and environmental policy needs rather than delivering crop estimates only**.** Each individual purpose listed above can hardly justify a LUCAS survey on its own. In particular, crop area

estimates based on traditional farm declarations exist in most EU Member States. The landscape indicators have not yet been properly defined and the Commission was asked by the Council to take close account of the costs and resource implications of any new data collection initiative that goes beyond the existing legal requirements. On the other hand, results of modelling efforts or remote sensing cannot replace in-situ (or ground-truth) monitoring such as that performed by LUCAS. LUCAS could be defined as one of the European in-situ standards (e.g. within the INSPIRE initiative).

The Mars project: the purpose of the agro-meteorological system of monitoring crops and forecasting yields, developed by the Joint Research Centre (JRC) as part of the MARS (Monitoring Agriculture with Remote Sensing) project, is to provide the evidence necessary for understanding how climatic events have an impact on harvests and to forecast the yields of the main crops. The main result of this activitiy is the MARS Crop Yield Forecasting System which has been operational since 1998. The Commission describes the methodology. It describes the publication of the MARS Bulletins include analysis of the impact of climate on the main EU crops, including short-term weather forecasts, and are regularly used by DG-AGRI's Outlook group of analysts. The information and data provided are used to support the CAP decision making process: i.e food balance sheet estimates, budgetary forecasts and follow up of expenditures, stock interventions and management, export tenders, definition of set aside rates and use, support to EU Markets, etc. Special issues on ad-hocanalyses are produced on request by DG-AGRI.

The Commission goes on to give an **evaluation of the results**. The MARS Crop Yield Forecasting System has made it possible to evaluate the impact of the climate on yields at EU-25 level, in an independent and homogeneous manner throughout Europe.

The yield forecasts from the Bulletin are used by DG AGRI as input data to compile the estimated balances for field crops for the EU and for the applicant countries. Evaluation of the forecasts issued is a permanent activity at the JRC's MARS unit. The errors in the quantitative yield forecasts are calculated from the final official data.

Lastly, the paper describes additional research activities carried out by the JRC under its own research budget and related to the reinforcement of land cover estimation methodologies The Commission concludes that in the light of the usefulness of the information and data provided in support of CAP deployment by the JRC in relation to MARS in recent years, the Commission wishes to continue this activity over the period 2008-2013.