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**Action undertaken by the Italian Ministry of Agriculture in remote sensing  
applications**

Document submitted by the Ministry of Agriculture of Italy

1. In 1978 the Italian Ministry of Agriculture launched numerous projects in the field of satellite remote sensing that consisted of a series of experiments applied to various provinces and regions. Experiments were completed in 1986 and their results led to the development of an advanced system for collection of agricultural statistics. The system was essentially based on two major tools:

- crop acreage estimates based on the integration of satellite data with land use data referring to areal segments;
- crop yield forecasts based on agrometeorological models implemented in GIS.

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2. Ever since 1987 this innovative system has been applied annually all over the country to acquire agricultural statistics aggregated at both regional and national levels. With regard to crop acreage estimates, the system developed by the Ministry was characterised as follows:

- digitization of national Area Frame at scale 1 : 25 000;
- stratification of primary sampling units into 14 land use classes;
- sampling of cropland through 5500 segments measuring 60 ha each;
- field surveys on sample segments in May and September;
- acquisition of 2 complete national coverages derived from Landsat, SPOT or IRS satellite images;
- preparation of regional and national statistics using regression estimators;
- issuance of bulletins through communication networks on 10 June, 10 September, 10 October and 31 December;

3. The crop average estimates are then integrated with the crop yield forecasts simulated by means of an agro meteorological model called SAM. This is a subtractive model that enables daily simulation of crop yields by considering the maximum possible yield in a given area and subtracting the percentage of yield that is lost through thermal and water stress during the agricultural season.

4. The simulation results are processed every 10 days thus providing the local administration with timely information on crop productions which is constantly updated according to the weather conditions that occur during the season.

5. The SAM model also enables the identification of agricultural areas affected by drought or frost and provides the Ministry with accurate, timely information on hazard-stricken areas. In these cases, an econometric model developed specially for this purpose enables the assessment of damages caused by natural hazards to every type of farming system.