

# **PRACTICAL REQUIREMENTS FOR EU ACCESSION COUNTRIES FOR LAND INFORMATION SYSTEMS IN RESPECT TO AGRICULTURE**

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## **1. INTRODUCTION**

In 1992 a reform of the Common Agricultural Policy (CAP) was introduced. The reform required a complete restructure of the aid system and, subsequently, a new spatial agricultural reporting system had to be invented and implemented in all the Member States. The reform is by far the most radical requirement imposed by the European Commission in terms of geographical reporting, and the different Member States have made substantial investments in their different Integrated Administrative Control Systems (IACS).

With the current legislation, new Member States joining the EU will have to create similar systems. Creating an IACS has been a substantial project for all the Member States and it is therefore essential for coming Member States to prepare the entry in the EU in order to use the co-financing opportunities in an optimal way and to be ready with the system within the timeframe given.

## **2. POLICY**

The reform of the common agricultural policy (CAP) adopted in June 1992 represents a watershed in agricultural support measures, involving a shift from price support to compensatory aid paid directly to producers.

This aid is related to the land cultivated and the number of livestock reared by the farmer. It entails measures to control production, such as set-aside and support for extensification of stockfarming.

The methods for administering and monitoring the aid must be adapted accordingly, in line with two main concerns:

- facilitating the task of farmers who wish to take advantage of the aid offered,
- administering the huge number of applications with the greatest speed and security.

Experience gained in the past in the administration and monitoring of this type of aid showed that, unless a totally new approach was adopted, the difficulties of application would have been considerable for both farmers and the departments in charge of administration and controls. It was also unthinkable to administer and verify each scheme separately. Accordingly, it was decided that a single processing system would cover all aid applied for by each agricultural holding.

In view of the large number of applicants, special means were adopted to optimise controls. In order to deal with this large number of applications and make payments to the farmers in time, exhaustive on-site checks could not be contemplated and provision was accordingly made for a maximum number of checks to be carried out at the administrative verification stage.

Sight needed not to be lost of the practical consequences for the farmers themselves of the adoption of new aid schemes. To that end, the administrative procedures were simplified as far as possible while a uniform framework was introduced for the application of several types of aid.

On that basis, the Integrated Administration and Control System for compensatory aid provided for under the reform of the CAP ("Integrated System") was adopted, utilising in particular modern techniques like data-processing and remote sensing, and perhaps one day soon the electronic identification of animals. The Integrated System provides for a single area aid application, to be submitted by the farmer each year. This is the key component for the administration and monitoring of area-related aid schemes. The Integrated System also entails the setting-up of computerised data bases enabling cross-checks to be conducted on holdings, as well as parcels and livestock. To conduct this type of check, provision was made for a system for identifying and registering agricultural parcels and livestock.

Regulation (EEC) No 3508/92, which introduces the Integrated System, provides for Community part-financing of expenditure incurred on its establishment. The Integrated System became applicable from 1 February 1993 as regards aid applications and integrated controls thereof, and as regards the system for identifying and registering cattle. The Member States had originally until 1 January 1996 to introduce the other components of the system. For the new Member States which acceded to the Community in 1995, the transitional period expired on 1 January 1997. Due to the fact that nearly all Member States were not ready by the 1 January 1996 a one-year extension was given in regulation 2466/92.

Article 10 of Regulation (EEC) No 3508/92 introduces Community part-financing of expenditure covering the implementation of the Integrated Administration and Control System as regards temporary staff resources and data-processing and technical equipment. Initially set at three years from 1992, the duration of the part-financing arrangements was extended to the end of 1995 in view of the work still to be completed and the transitional period laid down for the introduction of the system.

### **3. REGULATION 3508/92**

The legal base for the agricultural reform is described in regulation 1765/92. Shortly after, the regulation 3508/92 was adopted and the physical description of the Integrated System was drawn up.

According to article 2 in regulation 3508/92, the integrated system shall comprise the following elements:

- 1) a computerised data base;
- 2) an alphanumeric identification system for agricultural parcels;
- 3) an alphanumeric system for the identification and registration of animals;
- 4) aid applications;
- 5) an integrated control system.

Article 4 in the same regulation states that the alphanumeric system for identification of the fields is to be created on the basis of the cadastral maps and documents or other map references, on the basis of aerial photographs or satellite images or on similar documentation or on the basis of several of these elements.

#### **4. DATA SOURCE / MAP BASE**

Apart from the wide description of the regulations, no further requirements have been put forward to the Member States.

It is, however, the opinion of the Commission that the accuracy must be equivalent to a 1:10,000 scale analogue map. In a set of recommendations for aerial photography acquisition and orthorectification for the creation of a parcel identification system, the Commission states that:

“The expected output from this task is the production of digital orthophotos and optional hard-copy products with a geometric quality equivalent to 1:10,000 scale analogue mapping. This specification can be encapsulated as:

From the observation of an independent set of well-defined points in the image, the resulting residuals between the measured points and their absolute positions will lead to a 2D-RMSE of no greater than 2,5 m from their absolute position.”

The systems that have been created all refer to either cadastral or topographic mapping. Within those two map sets different ways of identifying each parcel or group of parcels (hereafter block) have been created. In general, this can be summarised in three groups, each with benefits and disadvantages. The systems are:

- Cadastral based system
- Parcel based system
- Block based system

#### **5. CADASTRAL BASED SYSTEM**

Countries like Italy have well established cadastres, which for historical reasons have been focused at land parcel tenure particularly relating to agricultural usage. Whilst there is good correspondence between the agricultural parcel and the cadastral parcel, it is not universal - it is thought that about 80% of agricultural parcels can be defined in terms of a cadastral parcel, but in other cases, the cadastral parcel must operate as an identification parcel.

The important feature of the cadastral based system is that the land parcels have an official status in terms of their identity, location, area and other features relating to land tenure. The official management of the cadastre should in practice provide the unique

identification system (a register of parcel IDs) required at the level of identification parcels.

There is however a number of features of a cadastral based system, which need to be considered:

- the cadastre and hence the parcel register are generally outside the control of the agricultural administration and because it is managed for a different purpose, the timing of the update and revision of cadastral parcel IDs is an issue.
- there is a requirement to uniquely identify agricultural parcels using a combination of the cadastral parcel ID, the use, the utilised area, the applicant and the year of the claim.

## **6. PARCEL BASED SYSTEMS**

In parcel based systems there is a requirement for the farmer to delineate the boundary of every agricultural parcel on a cartographic document. These are generally possible in those Member States that have large-scale topographic mapping or aerial photography, from which the boundaries of agricultural parcels can be identified.

In the UK for example, the topographic maps delineate to a large extent many of the agricultural parcels, and also have a unique ID in the form of an “official” grid reference for the centroid of the parcel. The topographic parcel does not universally correspond to the agricultural parcel, in which case the sub-parcel is used and identified by the applicant by adding a suffix to the parcel ID and delineated by the applicant. If a permanent change is implemented then a new reference for the centroid is generated and used for the parcel ID.

The requirements for such a system place a heavy burden on the maintenance of the annual changes to the agricultural parcel boundaries; however, a parcel based system would be the only system capable of managing the agricultural parcel to achieve the full degree of control specified by the regulation.

## **7. BLOCK BASED SYSTEMS**

Other countries have adopted identification systems based upon topographic mapping wholly using the concept of the identification parcel (block). In these systems no attempt is made to record the delineation of the individual agricultural parcel.

Block based systems make recognition of the fact that it may not be possible to delineate the agricultural parcels themselves on the cartographic reference documents because, as is the case in Portugal, parcel size is too small in many cases.

They also take account of the fact that agricultural practice produces as much as a 20% annual change in the boundary delineation of agricultural parcels and that it may be both impracticable and unnecessary to record this type of change.

Such systems are based upon the concept that there are many permanent boundary features (or at least semi-permanent) that can be found on topographic maps or orthophotos. These are used to define areas having as far as possible homogeneous characteristics - principally

eligible or ineligible. The ideal situation being that all land within a block must be declared annually in order to achieve an acceptable level of control.

It works on the principle that:

- if the sum of the areas declared within a block equal the official area of the block, then no false area claims can exist
- if the sum exceeds the block area then a false declaration has been made, and so all applicants participating in the block are forced to resolve the anomaly
- if the sum is less than the block area, then the accuracy of the declarations may be true but is inconclusive from a control point of view.

The issues to be considered are:

- the definition and maintenance of the blocks
- the fact that the block IDs are under the control of the agricultural administration
- the requirement for an agricultural parcel to be uniquely identified by Block ID, the use, the utilised area, the applicant and the year of the claim
- the simplicity of management, block boundaries need only be revised if consistently under-claimed
- the limited degree of control at the agricultural parcel level

## **8. MAIN GEOGRAPHIC DEVELOPMENT IN THE MEMBER STATES**

Member States do not apply the same system of identification. The systems for identifying agricultural land applied by the Member States may be distinguished by reference to two main criteria:

- Some systems are based on references (maps and numbering) existing beforehand, like the land register in Spain, Italy, France, Germany, Luxembourg and Austria, and the Ordnance Survey maps which cover most of the United Kingdom.
- Other systems have been created from scratch to meet requirements laid down by regulation. This is the case in Ireland, Greece, Portugal, the Netherlands, Belgium, Denmark, Scotland, Finland and Sweden.
- Some systems identify agricultural parcels, as in Germany (11 Länder), Belgium, Italy, Spain, France (simplified system), Ireland (arable land), Luxembourg and the United Kingdom. Others identify blocks (or *îlots*) comprising land declared, as in Germany (5 Länder), Austria, Denmark, France (general system), Finland, Sweden, Portugal, Greece, Ireland (fodder areas), Scotland (fodder areas) and the Netherlands. In the latter case, two major variants exist alongside each other, whereby the block is created by the farmer (AT, DE, FR, IE and FI) or defined by the authorities on the basis of maps or aerial photographs (DK, EL, NL, PT and SE).

As a result there are various situations differing in terms of:

- Cost and time required for the implementation: where it is feasible, the land-registry approach (whether or not involving blocks) is the quickest system to introduce and consequently least costly;
- Ease of use for declarants: the approach by blocks makes declaration easier in so far as the references are fewer in number and more stable over time;
- The need to validate the units created by the farmer by comparison with official sources, on-the-spot inspections and recent aerial photographs;
- Effectiveness of computerised cross-checks based on the size of the reference units, their stability, the updating intervals, the proportion of ineligible land, and the number of farmers using the same identifier.

In general, the main trends have been to create sophisticated systems (sometimes GIS solutions) by which it is possible to:

- handle large amounts of data in a relatively simplified way.
- encode and match data against existing registers
- make 100% cross controls and create risk analysis based on e.g. amount of hectare, declared crop types, amount of aid.
- update and validate administrative and map information

It is, however, the individual Member States that define their strategy and consequently whether or not a sophisticated system is created. The initial costs for creating these systems are relatively high compared to the use of more manual / simple systems. The sophisticated systems have however shown that they are easier to run and maintain and that they are more efficient.

## **9. POSSIBLE CHANGES IN THE LEGISLATION**

During the creation and implementation process of IACS the EU has been very active in supporting the different Member States and the EU has constantly been evaluating the different systems.

During 1999, several discussions have taken place in Brussels in order to change the current regulation 3508/92. After the implementation period and after running the different systems in the Member States for several years, it appears that the countries using digital orthophotos and geographic information systems have the systems that are most effective and valid.

However, any amendments to the regulation 3508/92 have not yet been approved, but the opinion of the Commission is clearly shown in a “Note for the file” from September 1999, where the following points are written:

- Locating and measuring agricultural areas create wide-ranging difficulties for farmers who are not technically prepared for the task. These difficulties become more pronounced when the available maps are old, or when the agricultural parcels to be declared no longer match the reference parcels used to locate them. This is often the case with parcels as recorded in the land register. Errors at this stage cause delays and

penalties. Any simplification can only improve the image of compensatory aid, and thus of the authorities.

- Photographs are undeniably more revealing than simple maps. Firstly, there are far fewer errors of localisation, thanks to landmarks recognised by the declarant (trees, hedges, buildings, ditches, etc.). Secondly, a recent photograph taken on a known date allows existing maps to be subdivided more finely by better location of the current boundaries.
- Measuring distance or surface area on a scale document permits a first check of the areas being declared. Such an approach allows the authority to take a harder line on problems and, in certain cases, to identify and solve any problems with the declaration at source.
- Agricultural associations could play a greater role in the process. Making GIS data available as a management aid could motivate them to provide a service that is currently the responsibility of the authority, either by providing support for declarations, or by resolving irregularities.
- Making GIS data available in digital form means they can be used by the most technically advanced 5-10% of farmers who have computer systems capable of managing their cropping plans.

Further down in the “Note for the file” it is written:

“Both the declarant and the authority benefit from the use of orthophotography. In practice, orthophotography can be used flexibly, either to complement an existing identification system (the land register), or as the basis for an identification system proper to IACS.

The use of orthophotography to verify the area identification system leads to 100% validation of the eligibility of areas thus checked (at least it allows any non-agricultural, wooded, built-up or non-areas to be rejected immediately). In a single stroke, this protects the system from accepting any ineligible areas that may be declared.”

## **10. CONCLUSION**

Being a coming Member State to the EU, it is difficult to create a clear strategy of what to do and what is actually required, knowing that it might take 2, 4, 6 or even more years before the country becomes a fully integrated member of the EU.

Being a Member State entering the EU today, it is without any doubt that the existing legislation must be fulfilled. With the current success IACS has had, it is doubtful that the whole concept of area aid to the farmers will be redesigned. However, in case many big agricultural countries enter the EU, the concept might be changed.

However, being a coming Member State a pre-entry strategy should be created. In 1992, when the regulation 3508/92 was adopted, the EU had realised that the development and creation costs for these large and complex systems were considerable and had therefore accepted to finance up to 50% of the creation costs. In general, it took most of the Member States nearly 1 year before they had designed their systems and many of the Member States did consequently not use the co-financing opportunities fully the first and second year.

A reasonable pre-entry strategy could therefore be:

- Get an overview of the current mapping situation in the country,
- Identify a possible solution based on existing knowledge,
- Continue to monitor the possible new solution. E.g. can the Ikonos satellite provide acceptable data?
- Follow the mapping situation in the rest of Europe,
- Identify new requirements from EU,
- On the basis of these facts, create a clear strategy that identifies what must be done when entering the EU and get the acceptance of the EU.

By using this strategy a new Member State can work purposefully just after the entry and benefit the most from the considerable co-financing.

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