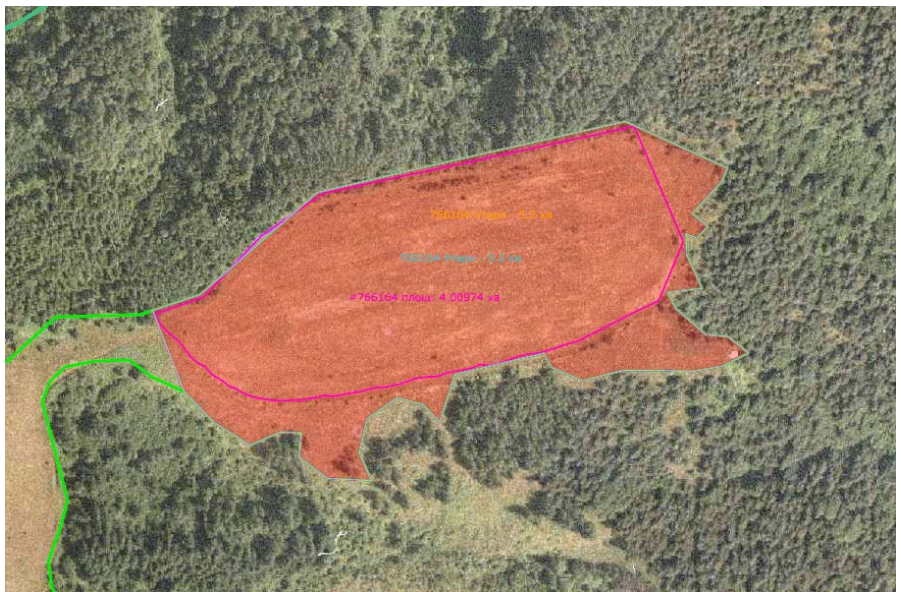


# Implementation and maintenance of the Land Parcel Identification System in Bulgaria

Dimitris Kapnias



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Report

**Implementation and maintenance of the  
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## 1. Introduction

### 1.1. Background

1.1.1. JRC had been active in Bulgaria since the pre-accession period in providing technical assistance to the Bulgarian administration on the implementation of IACS-LPIS. Reference of this activity can be found to previous reports:

JRC IPSC/G03/P/SKA/ska D(2006)(6244)	31/07/2006
JRC IPSC/G03/P/SKA/dka D(2006)(6285)	11/08/2006
JRC IPSC/G03/P/SKA/dka D(2006)(6592)	12/10/2006
JRC IPSC/G03/P/SKA/dka D(2006)(7027)	18/12/2006
JRC IPSC/G03/P/HKE/hke D(2007)(7952)	12/06/2007
JRC IPSC/G03/P/DKA/dka D(2007)(8249)	07/08/2007
JRC IPSC/G03/P/DKA/dka D(2007)(8469)	02/10/2007

### 1.2. Report objectives

1.2.1. The report is a follow-up to the request for technical assistance of Mr. Abazov<sup>1</sup> (letter dated 21/11/2007). The general objective was to review the current status of the LPIS, to identify problems and to provide technical assistance to the Bulgarian administration. A more specific topic as requested by the Bulgarians was the monitoring of the LPIS completion project which began last October.

1.2.2. A secondary objective was to review the progress made with regard to the On-the-Spot Checks (OTSC) and particularly the Control with Remote Sensing (CwRS).

## 2. Status of LPIS

2.1. During the presentation of the current status of LPIS, two main issues were raised for discussion: the **completion** and the **update** of LPIS. The former concerned with the project running the last 4 months in order to create a full coverage with Physical Blocks; the latter with the update procedures that have been planned for the following year.

### 2.2. Completion of LPIS

2.2.1. As has been reported before, the strategy that was followed for the implementation of LPIS included the digitization of PBs only in agricultural areas and not for the total area of the country. As a consequence only **53.24%** of Bulgaria's area was covered with PBs. Last year

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<sup>1</sup> Bulgarian Deputy Minister of Agriculture and Forestry (MAF)

about 500 Farmer's Blocks (FBs) were claimed for SAPS outside the existing PBs and MAF estimated that this number could be increased significantly the next year. Therefore as a follow up to JRC recommendations and DG AGRI's audit mission last June, MAF decided to implement full coverage for LPIS

2.2.2. The initial plan for the completion of the project was for the end of 2007 but then revised for the end of January or mid February as it seems that the workload of the project was initially underestimated. Considering the progress at the moment this deadline can be met.

2.2.3. The digitization began in October 2007 at the two regional offices of MAF in Vratza and Razgrad, according to the initial plan. In November due to the identified work overload MAF established two more digitization centres in Sofia and Sliven. Each of those centres employ 20 digitizers transferred from the local offices, most of them have worked before on LPIS digitization.

2.2.4. At the time of the visit the digitization of the PBs has been completed in 24 out of 28 districts which cover 77.42% of the total area of Bulgaria. The work in the four remaining districts (22.58%) has already begun.

2.2.5. During the visit to the regional office in Sofia we had the opportunity to assess and discuss on-screen not only global aspects regarding the approach followed for the digitization but also to examine specific cases. The main findings were:

- The precision of the digitization is very satisfactory meaning that the digitized lines follow the physical boundaries. Sometimes it is obvious that a very large digitizing scale has been used resulting in very "detailed" lines consisted of too many vertices. It should be avoided because it increases significantly the volume without adding any practical value to the data.
- The digitization strategy is focused on the creation of single-use polygons. Obviously, this strategy is recommended provided that stable physical boundaries are identified for delineating the polygons. In other words, the primary strategy for creating Physical Blocks should be followed as possible. This principle does not always apply (Figure 1. left image) in Bulgarian LPIS and therefore in some cases the boundaries of the PBs cannot be considered as permanent.
- However, it is important to point out that the creation of LPIS in Bulgaria is based not only on photo interpretation of the orthoimages but also on "ancillary" data such as the farmers' blocks, the claims and the cadastre. The use of such data often explains choices which are not completely justified by the image interpretation.

- Another issue that was discussed refers to the PBs in semi-urban areas (Figure 1. right image). These PBs consisted of both non-eligible (mostly small buildings) and eligible land. In order to determine the eligible land in these polygons, MAF has adopted the approach used for the so-called “abandoned land”. Particularly, the non-eligible land of the PBs is visually estimated by the interpreter and the PB is classified to one of the available four classes (0-10%, 10-25%, 25-50%, 50-75%). This practice can be effective (cross checks) provided that the classification for each PB is correct. Keeping the PBs relatively small could help in achieving a good estimate for the non-eligible land of such PBs.



**Figure 1.** Examples of Physical Blocks in rural (left) and semi-urban areas (right).

### 2.3. LPIS update

- 2.3.1. MAF has decided to implement a yearly cycle of update of the LPIS in the form of field visits. The methodology for these checks, which has been described in August 2007 (8249.doc), is based on visual checks of both suspicious and randomly selected PBs. For the next months MAF plans to exercise three periods of field visits in Jan-Feb, Apr-Mar and Jul-Aug. It is also planned that the field inspectors will soon carry high-accuracy GPS receivers in order to perform measurements of boundaries. A tender for the procurement of the receivers is on the way.
- 2.3.2. MAF has also decided to begin the update of the orthoimages already this year. The plan foresees about 20% of coverage with new ortho images every year in order to comply with the obligation of maintaining the LPIS up-to-date (5 years cycle). MAF would prefer to sign a multi-yearly contract (5 years) with one contractor rather than procuring a tender every year. The main points of discussion on this were the following:

- Bearing in mind that the update of LPIS will be made internally using existing MAF's human and technical resources, the decision of updating 20% every year rather than 100% every 5 years is very reasonable.
- A multi-yearly contract will significantly decrease the administrative workload for MAF in comparison to the option of the annual contracts. Usually such contracts can lead in reduced costs for the completion of the project.
- The contractor can be more flexible if changes in project plan have to be made e.g. whether problems or change of priorities. On the other hand the administration has to be very careful in the contract terms and specifications because they will be "tied" with the same contractor for a long time.
- JRC will provide assistance on the technical specifications and quality control procedures in order to make sure that the final product will meet MAF's needs.

2.3.3. The satellite orthoimages that used for the Controls with Remote Sensing (CwRS) will also be a source material for LPIS update for the next months, according to MAF's plans.

### **3. LPIS inter-connection to other data**

- 3.1. The inter-connection of LPIS with other projects such as LUCAS, BANSIK, Natura 2000 had been raised by MAF during the previous meeting but this time it became more clear and it was discussed in more detail. Specifically:
- 3.2. LUCAS, BANSIK. A discussion was made mainly on the potential use of such data for the control of direct payments. There is no obvious direct connection between them but considering that such samples cover the whole country (about 8,000 points for each project) an internal JRC discussion could follow-up to examine it.
- 3.3. Natura 2000 and Rural development payments. Bulgaria is in the process to define the Natura 2000 areas. MAF in collaboration with Ministry of Environment are responsible for the digitization of these areas. The main background used is cadastre. The question raised by MAF is if LPIS should be the base for defining Natura (or vice versa) so to achieve consistency between the two data sets. Considering that Natura is subject to check for Cross Compliance and also it is used for rural development payments the integration of these data in one system is necessary. However, it is a subject for further examination if LPIS and Natura2000 will be just integrated in IACS or if there is a necessity to match their boundaries (e.g. Hungary).

## **4. On-the-Spot Checks (OTSC)**

### **4.1. General**

4.1.1. The OTSC were performed by the Paying Agency (SFA) and according to the last update during our meeting the final figures are the following:

- About 6,800 dossiers were checked with classical OTSC instead of the 5,000 that were planned. The number was increased due to the identified high risk of over declaration during the DG AGRI audit mission in September 2007.
- Another 1300 dossiers were controlled with Remote Sensing (CwRS). These dossiers correspond to 1/3 of the applications within the 3 pre-selected sites (see more below).
- Additionally all claimed parcels that were flagged as possible abandoned land (code 6) were checked as it was planned. It should be noticed that only the specific parcels of the applicants were checked and not the whole dossier (about 9,000 applicants and 100,000ha).

4.1.2. Thus the total number of OTSC involved the control of 8,100 dossiers out of 70,053 (11.5%). About 75% of those were selected based on risk analysis and the rest randomly. In addition another 9,000 applicants were partially checked.

### **4.2. CwRS**

4.2.1. During the visit to the CwRS department in SFA we had the opportunity to review the progress made and to discuss the problems that the personnel faced during the interpretation. Specifically:

- Orthorectified images. The satellite imagery for all three sites was orthorectified by external contractor. However, apart from the delivery protocol there is no documentation available to SFA regarding with the quality of the orthoimages. So any assessment of the images is based only on visual checks performed on-the-screen. The checks for the VHR orthoimages showed that the images are of good radiometric quality. Regarding accuracy the only possible check was against the digitized claimed parcels but it cannot be considered very reliable. The only safe conclusion that came out of this check was that no gross discrepancies were identified. A quality control report of the orthoimages should be prepared either by the contractor or/and by SFA. For example the LPIS base orthoimage could provide a very quick means of identifying presence of geometric inconsistencies.
- The boundaries of the parcels were digitized precisely and no problems were identified during this check. It is possible however those misidentifications happened at the



interpretation of the land cover/ use due to lack of experience of the interpretation team and also because of the lack of any document that would assist the interpretation (e.g. manual). Such documentation should be prepared for next year and as it was discussed the DMC<sup>2</sup> team of GeoCAP can provide important assistance on such issues.

## **5. Concluding remarks**

- 5.1. It is realistic that Bulgaria will have full coverage with PBs by mid-February. The completion project has produced good quality data but problems have been identified. The LPIS update programme of MAF is quite satisfactory and if followed will maintain the LPIS data up-to-date. The technical specifications for the new orthophotos should assure the final quality.
- 5.2. The interaction or even integration of LPIS with other data such as Natura200 is a subject for further investigation inside Geo-CAP but also with the M.S.
- 5.3. SFA established a team for the CwRS and despite the late start and the difficulties the plan was achieved. DMC team should follow-up for a more comprehensive assessment for last year's controls but also in order to provide technical assistance on photo-interpretation before the next campaign.

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<sup>2</sup> Development of Control Methods

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**Abstract**

JRC had been active in Bulgaria since the pre-accession period in providing technical assistance to the Bulgarian administration on the implementation of IACS-LPIS. This report came as a follow-up to the request of the Bulgarian Ministry of Agriculture for technical assistance. The main objective is to review the current status of the LPIS, to monitor the current program of update and to identify potential problems. Since LPIS is related to other components of IACS issues concerning the interoperability of different data are also discussed.

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