GIS SUPPORT FOR VINEYARD REGISTER OF THE HUNGARIAN MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT BY THE LAND ADMINISTRATION

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In response to the EU requirements, the Hungarian Ministry of Agriculture and Rural Development (MARD), advised by the expertise of grape-wine sector in 2001, decided to delegate the task of the GIS support of the Vineyard Register to the FÖMI Remote Sensing Centre. The FÖMI RSC had been participated in several tasks concerning the vineyards to assist the MARD in the National Program of Adopting the Adoption of the Acquis (NPAA). The FÖMI RSC started to develop methods for satellite based vineyard area assessment, in the 1997-98 period, using high-resolution satellite data (Landsat TM, SPOT, IRS-1C/1D LISS-III) for the MARD. The complete survey of Eger Wine-growing Region was accomplished by remote sensing in the spring of 1999 and the complete vineyard area of Heves county, including Mátraalja Wine-growing Region, had been accomplished during the fall of 1999, within the frame of the NPAA /VII/A/6 EU Harmonization Program. In 2000, the FÖMI RSC participated in a trial survey preparing the registration of wine- and fruit-growing areas for a national vineyard, orchard census executed by the Hungarian Central Statistical Office (HCSO). The GIS support for the existing HEGYIR vineyard databases providing Vineyard Register for all of the vineyard communities is a currently on-going project (DLM MARD/FÖMI, NPAA I/A/5) in the FÖMI that began in 2001.

1. Introduction and background

Due to the upcoming EU accession, Hungary has to fulfill the EU requirements in all areas of the administration. Because the Hungarian economy greatly depended on Agriculture it is necessary to harmonize, the legal background and the methodology with the EU. Therefore, the Hungarian Ministry of Agriculture and Rural Development (MARD) got accentuated tasks in the National Program of Adoption of the Acquis Communautaire (NPAA). The tasks of the Land Administration are the following:

- Land use/land cover (CLC, Lucas)
- ITT development at Land Offices (land registry, cadastre)
- Provision of application oriented products (e.g. orthophotos)
- Monitoring and control (crop, area-based)
- Land Consolidation/National Land Fund (land tenure)
- **Support establishing National Vineyard Register**
- Multipurpose use of the services and products in MARD
- Internet based solutions (metadata)
- Links and networking (domestic, bilateral, international)

Among these tasks, the “Support establishing National Vineyard Register” started in 1998, and it dissolved to several tasks. From the beginning, the FÖMI RSC had been participated in these tasks to assist the MARD in the execution of the NPAA.
2. **The vineyard related tasks of the NPAA**

2.1. **1998-1999 Surveying of vineyards by remote sensing**

FÖMI Remote Sensing Centre started to develop methods for satellite based vineyard area assessment using high-resolution satellite data (Landsat TM, SPOT, IRS-1C/1D LISS-III), in 1997-98 in marked area of Mór, Etyek, Szekszárd wine-growing regions and the report about this was delivered in May 1998. We considered vineyards above 500 m$^2$ (producing) during the survey. A thorough assessment of vineyard areas, such as large scale and traditional farms, new plants, vineyard gardens and uncultivated (abandoned) vineyard fields was accomplished by FÖMI RSC and cross checked with MARD experts (Figure 1.). The surveying results provided statistics, reliable maps and numeric data serving also the needs of the administration and also the wine-growing communities.

The complete survey of Eger Wine-growing Region was accomplished by remote sensing in spring 1999 (Figure 2.). Owing to the favorable reception of our work we surveyed the complete grape area of Heves County including Mátraalja Wine-growing Region in autumn 1999 within the frame of NPAA/VIII/A/6 EU harmonization program.

![Figure 1. Vineyard Mapping Using Remote Sensing](image1)

![Figure 2. Wine-Growing Region of Eger Mapped by Remote Sensing (1999)](image2)
2.2 1999-2001 Spin-off task: participation in countrywide census of vineyards and orchards

In 2000 the Hungarian Central Statistical Office (HCSO) charged the FÖMI RSC with a trial survey preparing the registering of wine- and fruit-growing areas for a national vineyard and orchard census. In 2-2 communities (villages) we compared the results of surveys of wine- and fruit-producing areas based on field surveys and satellite imagery. After that, the HCSO used the 1:50 000 thematic maps of Hungary (Figure 3.) created by the FÖMI, to plan and prepare the field surveys of the national vineyard and orchard census.

![Thematic Map of Vineyards and Orchards Derived From High-Resolution Satellite Imagery](image)

Figure 3. Thematic Map of Vineyards and Orchards Derived From High-Resolution Satellite Imagery

2.3. GIS support for the existing HEGYIR vineyard databases for all of the vineyard communities since 2001

The MARD, advised by the expertise of grape-wine sector in 2001, decided to delegate the task of the GIS support of the Vineyard Register to the FÖMI Remote Sensing Centre. The on-going project (DLM MARD/FÖMI, NPAA I/A/5) GIS supports the existing HEGYIR vineyard databases providing the necessary GIS background for the Vineyard Register in all of the vineyard communities.

The present regulation on the Vineyard Register is made up by the Council regulation 2392/86 and the Commission regulation 649/87. These regulations define the Vineyard Register. It should be a detailed database of holdings, parcels and characteristics. The information collected of each holding where vines are grown relating to:
- It’s identity and situation
- The reference of the parcel under vines
- It’s general characteristics
- And the characteristics of the vines it contains and the products produced there from.

The register should include a production file relating to the processing and marketing of the wine product. To fulfill the requirements of the law these regulations gave a period of 6 years, but due to technical difficulty several countries couldn’t meet this criteria, thus they developed a simplified register. The regulation stresses, that the information in the register must always show the actual situation on the market in wine. It orders the member states to provide the computer background of running the register. The Council regulation 1549/95 specifies the set up of the simplified register, which hast to link aid to area as well as vineyard
operation, reinforce mapping aspects and harmonize methodology with the Integrated Administration and Control System (IACS). The purpose of the GIS in the vineyard registration is to be a tool for the management and control of the Common Market Organization (CMO). Therefore, the Vineyard Register should comply with the IACS, even though it is a completely separate database, because the EU wants to be able to track the subsidies applicable to the vineyards. The Council regulation 1593/2000 gives a new point of view by ordering that the GIS based parcel identification should be set up at the latest on the 1st of January 2005. The use of aerial photography or ortho-imagery with standard accuracy at least equivalent to cartography at a scale of 1:10000 is recommended (currently not required, but considerably helps the process of identification). These can be used for parcel photo-interpretation, and the digitizing of the vineyard perimeter. The GIS background for the Vineyard Register has to include wine parcels and or blocks and the vineyard perimeter to map the detail of existing and potentially eligible vineyards. Therefore, the vineyard communities use the products and services provided by the Land Administration and introduced by the FÖMI in the above-mentioned NPAA program.

The history of viticulture regulation dates back to the 14th –15th century, and the first real vineyard communities similar to the ones we have today, had been established in the 17th century. The vineyard communities and the whole sector experienced some ups and downs, for a period, they even had to be brake up; however, after more than a quarter of a century, in 1994, the vineyard communities had been reintroduced, to build up a system to support the wine-viticulture sector. The bases of this organization are the vineyard communities, which form the wine-growing regions, and the 22 wine-growing regions belong to the National Council of Vineyard Communities (Figure 4.). We have a special case in Hungary, because 20%-t of the vineyard does not belong to this organization, thus the administration is currently working on the solution to extend the competency of the Vineyard Communities in order to compile with the EU.

Figure 4. The 22 Wine-Growing Regions of Hungary and the NUTS5
The HEGYIR, the registration system that the vineyard communities use was generated after the model of a system used in Germany, but it had no GIS background. Thus, because the EU requires the geographic references to the database, the FÖMI developed a way to provide the vineyard communities with a GIS background to complete the HEGYIR system. The project DLM MARD/FÖMI, NPAA I/A/5 is currently in progress. As an order of the Ministry we installed a program necessary to view the maps, with all the required maps, and in one vineyard community in each wine-growing region as an experiment we also install some optional parts of the GIS. In the first phase of the initializing of the project approximately 20% of the total area had been covered, including 4 wine-growing region (Mátraalja-, Villány-, Pannonhalma-Sokoroalja-, and Eger Wine-growing Region), 49 vineyard communities and 71 settlements. The second phase, which now is on the way to completion, covers 6 wine-growing region (Etyek-Buda-, Balatonboglár-, Szekszárd-, Sopron-, Somló-, Badacsony Wine-growing Region), which is about 45% of the total area. The third phase will complete the rest of the task (Csongrád-, Hajós-Baja-, Kunság-, Ászár-Neszmély-, Balatonfüred-Csopak-, Balatonfelvidék-, Mór-, Mecsekalja-, Bükkalja-, Tokaj-, Balatonmellék-, and Tolna Wine-growing Region. Figure 5 shows the required layers that the vineyard communities are getting in the initializing phase of the project. After covering all wine-growing region and vineyard communities we will maintain the database and extend the range of the layers according to the needs of the users and the requirements of the Ministry. The FÖMI and the National Council of Vineyard Communities (HNT) can provide centralized update for each of the vineyard communities, based on the annual change listings submitted by them.

Figure 5. The Required Layers That the Vineyard Communities are Getting in the Initializing Phase of the Project
Besides the mandatory parts of the GIS dataset (1:4000/1:2000 cadastral maps; vector layer of vineyards; 1:10 000 topographic map;) the optional parts can include for example: 1:10 000 digital orthophoto; control by remote sensing; hight-interval, slope-category, and aspect map derived from high-resolution DEM to be settled at wine community level ensuring effective collection, geo-referencing, handling, control, visualization, maintenance and reporting of thematic vineyard register data for local, regional and MARD use (Figure 6.).

Figure 6. Mandatory and Optional Part of the GIS Dataset to be Settled at the Vineyard Community Level

3. Conclusion

According to the EU regulations and the decision of the MARD, in cooperation with the National Council of Vineyard Communities (HNT) and other expertise of the grape-wine sector the FÖMI is currently establishing the GIS background to complete the HEGYIR system, which is currently used as the Vineyard Register. The initializing phase of this project is finished at 4 wine-growing regions, and currently progressing at 6 additional wine-growing regions, and most likely will be done by the EU accession of Hungary. After the initializing phase the next task will be the continuous data maintenance and further development to extend the range of the layers according to the needs of the users and the requirements of the Ministry. Among other use of the Vineyard Register, one of the most important role will be the keeping track of the Restructuring aids of the EU, including subsidies for the planting, grubbing, conversion or relocation of the vineyards.
LITERATURE


