

THE NATIONAL CADASTRAL PROGRAMME A NEW CHAPTER IN THE HISTORY OF THE HUNGARIAN LAND ADMINISTRATION

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NEMZETI KATASZTERI PROGRAM ÚJ FEJEZET A MAGYAR FÖLDÜGYI SZAKIGAZGATÁS TÖRTÉNETÉBEN

Összefoglalás

A Nemzeti Kataszteri Program (NKP), ide értve annak felgyorsítását célzó új szemléletű részprogramját is, a földügyi és térképészeti szakág egyik történelmi jelentőségű feladatának minősül. Az NKP kezdeti szakaszában a DAT szabvány és szabályzat szerint előállított termékek révén, továbbá a felgyorsítás I. üteme négy évre tervezett végrehajtását követően a földhivatalokban, valamennyi település esetében olyan szabványos adatbázis, illetve vektoros digitális térkép áll rendelkezésre, amely egységes országos vetületi rendszerben (EOV), számítógépen kezelve, lehetővé teszi az ingatlan-nyilvántartás integrált informatikai alapon történő kezelését és a nemzetgazdaság multifunkcionális térképi igényéhez az alapok biztosítását. A vektoros térképi adatok módját adnak arra is, hogy a működő földhivatali adatátviteli hálózathoz (TAKARNET) hozzáférési engedéllyel rendelkező hivatalok, intézmények és ügyfelek megrendeléseit azon keresztül, számítástechnikai eszközökkel elégítse ki a földügyi szakigazgatás. A vektoros háttér segítségével gyorsítható a földhivatalok munkája a térképi változások átvezetésében, a térképi adatok szolgáltatásában.

A kormány által jóváhagyott NKP-konceptió szerinti II. ütem egy későbbi időponttól (2008) tervezi megvalósítani a helyszíni méréseken alapuló, kibővített tartalmú és nagyobb pontosságú, homogén, digitális térképi adatbázis (lásd: DAT szabvány és szabályzat) létrehozásának folytatását, mely az állam hosszú távú, kötelező feladata – a földmérési és térképészeti tevékenységről szóló törvény előírásainak értelmében.

Summary

The National Cadastral Programme (NCP), including its new sub-programme with the aim of accelerating the whole implementation, is considered one of the historically significant tasks in the land surveying and mapping sector. Thanks to the products created in line with the DAT Standard and Regulation in the initial phase of the NCP, and following the completion of the four-year Phase I of acceleration, the land offices by now have a standard database and a vectorial digital map covering all settlements of Hungary. All these allow the operation of a computer-based, integrated land registration managed in the Unified National Projection System (EOV), and serve as a basis for satisfying the demands of the national economy on multifunctional maps. These vector based mapping data and the IT environment also allow the Land Administration to fulfil the orders of authorized offices, institutions and clients having access permit to the data transfer net (TAKARNET). With the help of the vectorial background, the land offices' work in updating and supplying map information can be speeded up.

In Phase II of the NCP conception approved by the Government, it is planned to continue building up a more complex, consistent and digital mapping database of higher accuracy and based on on-site measurements (see DAT Standard and Regulation) from a later date (2008). Provided by the Act on Land Surveying and Mapping Activities, it is a mandatory long-term duty of the Government.

Introduction

It is a widely accepted fact that in the current Hungarian reality there is no other choice than undertaking the inevitable duties and coping with the challenge of creating the Information Society. It is well-known in Hungary that the development of large scale *state land surveying base maps* (traditionally and in everyday language known as *cadastral maps*) makes it evident that the parcel-deep maps play an infrastructural role in the building up of IT systems, as they are the carrier of all those highly significant data and information without which the *geometrical coordination*, in other words the *geometry order* cannot be realized. It is obvious that the administration, further on, the legal relationships and transactions connected to property right in land and other real estates – even in the present status of civil law – cannot go on without collecting data with proper details and accuracy, authorized registration, reliable and guaranteed service. The cadastral map is one of those decisive factors forming the basis for a service of this quality as long as – using the tools of the information society and computer-based solutions – we are able to create and handle the cadastral map and transmit its data content satisfying rightful users' demands.

In accordance with the existing legislation, it has been a governmental duty to supply the country with state maps. It is known that various map types fit in this category. Because of their importance mentioned above, the creation of the cadastral maps got an emphasized qualification. At the beginning of the 1990s, the situation of the state cadastral maps (their varying projection systems, scales, accuracy, and status of their content) created a very difficult situation for the land administration and governmental decision makers, as they had the wish to fulfil their governmental duties and the urging requirements of the information society. The must of modernizing the cadastral map system – which means the development of mapping databases with proper details – prompted to create a computer-based map system as soon as possible, but without sacrificing the high technical standards on the altar of high speed.

Another burden pressing the land administration and governmental decision makers was the restructuring of the Hungarian economy and society with the land privatisation and compensation, which induced further claims of maps and land surveying. The government had to assure the harmonization of the solutions for claims coming from two directions with compatibility as the privatisation was urged not so much by technical and modernizing intentions, but by political aspects. The *numerical technology* specified for privatisation, land surveying and cadastral operations was designed to realize the desirable harmony. Later on, the technology fulfilled those hopes indeed.

The development of computer-based cadastral map databases, considering the professional features and the special financing solution, required a *program-like implementation*. After several years of preparation, the government cleared the road for this very complex job that needed the union of all professional forces and the cooperation of the whole land management sector. Under the name „National Cadastral Programme“, the project started in September 1997.

The National Cadastral Programme's Original Purpose and Technical Terms

The National Cadastral Programme's original concept contains the accomplishment of map-making in the *long term*. The main goal is to make *computer-operated, multipurpose state surveying base maps* available throughout the country. These will also form the mapping basis of land registration. Within the NCP – according to the original plans – the computer-based digital maps are made by organized standard databases and updated by the changes taken from additional on-site measurements.

In the R+D preparatory phase of the NCP, the DAT Standard and Regulation – developed in the Institute of Geodesy, Cartography and Remote Sensing (FÖMI) and supported by the National Board of Technical Development – served as a technical background of scientific quality. An essential part of the technical specifications is the Unified National Projection System (EOV) – which was introduced in Hungary in the 1970s – and the obligatory use of numeric technology at on-site measurements. The mentioned DAT Regulation is in line with the relevant EU recommendations on standardization.

NCP Initial Phase and its Financing

Start, financing and operational conditions of the NCP are laid down in governmental decrees. The Ministry of Agriculture and Rural Development (MoARD) specified the tasks, which will be implemented through public procurement procedures by the National Cadastral Programme Public Benefit Company (NKP Kht.), which was founded by the Ministry. NCP is mostly financed from the state budget – under Governmental guarantee – defined in a bank credit contract made by NKP Kht. Various involved local governments also support the implementation from their sources based on separate agreements. The main source of returning the credit is covered from the income of supplying the data, which would be generated within NCP.

The initial phase of NCP was financed from the first amount of credit of HUF 6.6 billion. This amount covered the working costs until end 2003. By using this amount, the land surveying base maps of about 80 settlements (including certain capital districts considered as settlements) got ready according to DAT Standard and Regulation. It means that the on-site measurements of changes were also completed. These are the so-called „DAT datasets” (Figure 1). The above mentioned credit covered the costs of other important and relevant duties, too:

- Supporting the receptiveness of land offices;
- Education and training courses;
- Implementation of pilot projects for the elaboration of KÜVET technology (vectorial digital map transformation for rural areas).

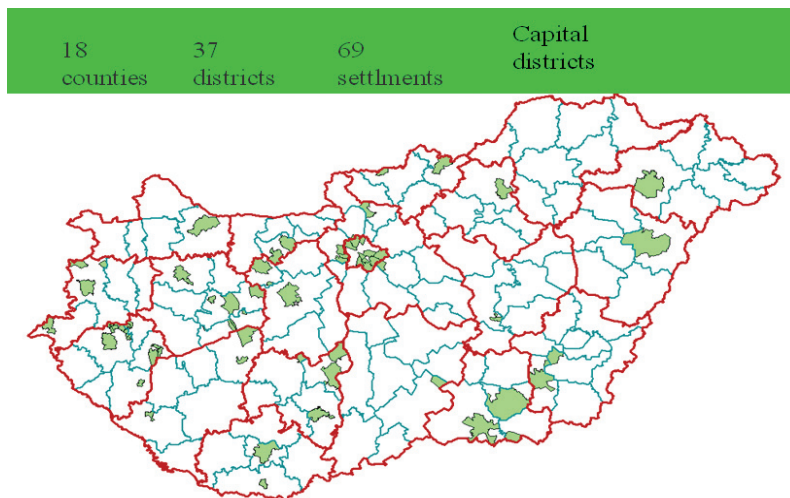


Figure 1. „DAT datasets” prepared in line with the DAT Standards, ready by 2005

Acceleration of the NCP

Initial experience shows that DAT map-making based on on-site measurements is very expensive and time-consuming. At the same time, the demands for computer-based digital cadastral datasets were ever growing on the Hungarian users' side on the one hand, and, because of the obligations resulting from the EU membership of Hungary on the other hand (e.g. creating the basis of the integrated administration and control system of the area-based agrarian subsidiaries – IACS). It became evident that though the programme should go on anyhow, politicians would not tolerate a perfect but expensive and time-consuming solution when implementing DAT.

Foreign examples justify that speed is an important factor, which – of course – correlates with costs as well. Also, countries richer than Hungary (e.g. Switzerland) are forced to give up *temporarily* the high-quality technical solutions. When preparing the new decision, the general assembly of EuroGeographics, the association of European national mapping agencies, held in Frankfurt in autumn 2002, gave an impetus to the realisation. The Hungarian delegation learned the recommendation addressed to the international forum, which coincided with the current problems of going on with NCP in those days. The slogan sounded „*A good solution now is better, than a perfect one tomorrow!*”.

Reconsidering the Hungarian conditions and experiencing the international difficulties in this respect, a proposal was submitted to the Government on the *acceleration of the National Cadastral Programme*. The main point was that the preparation of the databases of land surveying base maps supported by on-site measurements in line with DAT Standard and Regulation should be postponed. A so-called Phase I should be started with a priority of transforming analogue cadastral maps into *digital vectorial maps*. These will form the basis – after the necessary additional measurements and on-site data collecting – for creating DAT datasets in the framework of a Phase II, according to the original concept of the NCP.

The proposal was welcomed on high level, both by professional and scientific circles. As a result, a governmental resolution was brought in June 2003 on the acceleration of NCP Phase I, for the period 2004–2007. This allows the preparation of the vectorial digital version of state land surveying base maps so that the necessary HUF 9.8 billion should be allocated from credit, guaranteed by the State. The NKP Kht. signed the new bank credit contract on 17th December 2003 with a duration of 15 years plus a moratorium period.

In line with the implementation schedule, the vectorial digital base maps of rural areas (KÜVET) all over Hungary had to be prepared until end 2005. The processing of urban areas (BEVET) and special rural areas („hobby gardens”) had to start possibly there, where rural areas were already completed, but the whole project should be finished by end 2007. It was another planning aspect that the amounts of the yearly used credits should be of similar size. The unit of processing was defined as total area of one county.

It is worth telling about DAT processing of Phase II that within its framework we are planning to prepare the already digitised (BEVET, KÜVET) cadastral maps with on-site measurements and using most modern mapping technologies. In the current period of the Programme, we count with a yearly defined amount of costs. Depending on the progress, the costs of completing the job reach about HUF 1–1.5 billion per year. The starting credit structure does not seem advantageous anymore, so it can be proposed that from 2008 on, the costs of this Programme be planned and separated as a state basic duty among the chapters of MoARD budget, according to the Act on forming the yearly state budget.

Connected to the vectorial digital transformation, some very important aspects should be underlined:

- Increase the accuracy of the cadastral maps through vectorial processing,
- The non-registered intermediate local changes cannot be processed.

The original cadastral maps were produced in line with the specifications on content and accuracy, specified in the then existing valid professional regulations. The overwhelming majority of the maps are available now in traditional form, on non-shrinkable carriers, based on measurements completed in various periods, in various projection systems and scales. The datasets created with KÜVET and BEVET technologies reflect the quality, accuracy or errors of the original maps with the limit of tolerance permitted at the moment of preparation. Consequently, the vectorisation itself *does not improve the quality of maps, and it does not bring changes in content or accuracy*. This fact, however, must not divert us from vectorising, as the procedures of land registration, which generate changes in the map, are still updated manually in the analogue maps in the case of those settlements not having a digital map yet. Compared to this, computer-based map-making procedures produce better results from several points of view.

The above mentioned thoughts explain how necessary Phase II is. Namely, following the additional and on-site controlling measurements, the loading of databases created according to DAT Standard with the still missing data is inevitable. However, the maintenance of the existing database is also vital. The on-site measurements and data collecting can be completed on a yearly basis, applying the available and most modern technologies, which assure proper accuracy. Of course, revision and updating of DAT Standard and Regulation should also be timely scheduled.

The KÜVET Technology

Following the restructuring of the Hungarian economy, land compensation and – resulting from the cancellation of the cooperative ownership – also the so-called cooperative sharing took place. Thanks to a former farsighted professional decision, the parcels created during land privatisation procedure were pegged using numerical data, and they were also recorded in the land registration. Resulting of this procedure, valid and authorized numerical (digital) data were available for about 55-60% of the rural area. When applying the KÜVET technology, now we are using digital maps edited of these data by digitising the „missing“ areas from analogue maps.

The vectorial digital map of rural areas prepared for all settlements has a uniform layer distribution and point-coding as defined in a Ministerial Order published by MoARD. When preparing the maps, the technical data of land registration were compared to the map data (parcel number, area, sub-parcel, quality category). After resolving the accidental contradictions, the vectorial digital map of the rural area is officially accepted, and the analogue maps are taken out of use.

A bit prior to the original schedule, KÜVET was completed already in September 2005 for the whole area of Hungary. This is a very significant achievement in the history of our profession. Namely, this is the first occasion during the history of the country, when a computer-based, complete cadastral map work of uniform projection system is available. This dataset forms the basis for any further thematic database, processing or registration, which needs this fullness of details. Through land office network and scopes of authority, the updating of registered and legal changes in data content is guaranteed.

The BEVET Technology

The BEVET technology and its essential content is practically based on the experience and principles acquired during the processing of the rural areas. The difference is that few numeric data are available, therefore the digitisation of existing analogue maps forms the basis into which the data of certain parcels already having numeric data will be loaded. The digital transformation of maps of urban areas is taking place with a layer distribution

and point-coding method similar to that of KÜVET. During digital transformation procedure, the information concerning quality and reliability of the original analogue maps is recorded. In the framework of the final acceptance examination, they compare the technical data figuring in the land registration system, and the land offices' duty is to resolve the accidental contradictions. Then, using BEVET and KÜVET datasets, which can be handled as a land registration unit in the uniform system, being independent of location and original map scale, they compile the full vectorial digital map of the settlement.

With the exception of three counties (Csongrád, Fejér, Komárom-Esztergom), the BEVET Programme implementation is right under way. In the mentioned three counties, the public procurement procedure has started.

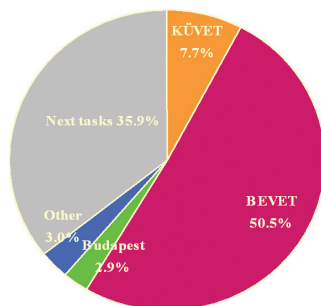


Figure 2. Status of using the credit amount of HUF 9.8 billion for NCP as of June 2005

Service and Supply through Data Transfer Network

An important advantage of the computer-based map datasets – among many others – is that service and data supply can be performed through data transfer network. The existing TAKARNET land office data transfer network supplying alphanumeric data will soon be able to supply also map datasets (DAT, KÜVET, BEVET). These data will also be available on the Internet for authorized registered users, similarly to the way of supplying property sheets, which has already been functioning. Figure 3 shows the TAKARNET structure.

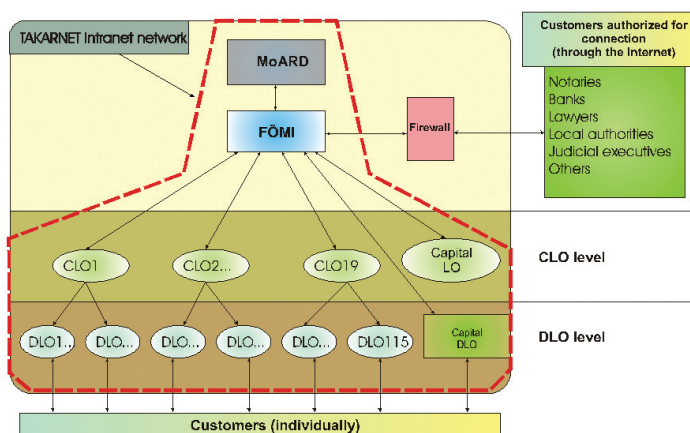


Figure 3. TAKARNET Structure (logical network)

Official Acceptance and Use of the NCP Datasets

The aim of the NCP is to reach the official acceptance of the digital datasets as soon as possible, to replace the traditional cadastral maps with digital ones, and to start new types of service. This aim requires the fulfilment of both personnel and material conditions, which is the duty of MoARD. The personnel conditions can be created relatively easily, through education and training, considering that this kind of skills and daily routines of the civil servants working in land offices guarantee the success. Providing the offices with computer hardware of proper capacity and software background, the continuous replacement of the outdated tools is a very expensive procedure, which needs sources from the central budget.

NKP Kht. has also been exerting significant efforts in this respect. Supporting the updating, the bulky data loading and the official acceptance of base maps produced in line with DAT Standard and Regulation, NKP Kht. signed a contract of public procurement procedure for further development of DATView software (version 3.0). Results of the development and testing show that the integrated system is functioning without errors. In line with the standpoint of the Department of Land Administration and Geoinformation of the Ministry of Agriculture and Rural Development, in those district land offices having DAT datasets (31 offices as of February 2006) DatView system can be installed. Following the completion of the software, NKP Kht. organised training courses, involving the College of Geoinformatics, University of West-Hungary where 72 staff members of district land offices have participated in the one-week courses, in groups of 12 persons.

Following the completion of KÜVET and BEVET, the next step is to raise all land offices to the same level: this is inevitable for the final success.

Returning the Loans

Provisions are made for covering the repayment on the first place from the income generated by the selling of digital map data produced within the framework of NCP. Beyond this, at starting the Programme, the governmental proposal mentioned the income generated by the supply of property sheets from the land registration system as a source, too, considering the organic relations among data. Consequently, when returning the credit, this latter source cannot be omitted either. Two further facts also support this argument: on the one hand: the income generated from land registration is currently much bigger than that of selling maps, - on the other hand: this used to be one of the arguments supporting the transformation of former stamp duty into administration service fee.

To covering the repayment also belong those amounts co-financed by local governments, mostly realized through the contracts mostly made in the initial phase of the NCP. Unfortunately, the financial means of the local governments have diminished by now, so those resources are exhausted.

Moratorium for the first credit amount (HUF 6.6 billion) came to the end, so the repayment had to be started from 1 January 2005. The moratorium for the second credit amount (HUF 9.8 billion) will expire at the end 2008.

This is the responsibility of the land surveying and mapping sector, or even of the Ministry of Agriculture and Rural Development to create the conditions for returning the loans by mobilizing all possible (legal, organisational and administrative) means.

Conclusions

Currently, NCP is the most important project in the land surveying and mapping sector, and historically it is of decisive significance. In general, it can be stated that the

implementation is going on according to the planned and undertaken schedule. All involved parties – Ministry of Agriculture and Rural Development, Department of Land Administration and Geoinformation (DLAG), NKP Kht., land offices, FÖMI, experts – are acting in close cooperation. There is a firm hope that the continuation of the programme will be similarly successful. However, it is an extremely important task to place the ready digital cadastral datasets to official acceptance, to arrange the conditions of repaying the credit in a satisfying way, and in parallel to start and extend an up-to-date the data supplying activity, always adjusted to the clients' demands.

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