

The Establishment of a Surveying and Mapping Authority of Kosovo?

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Key words: KCA, Kosovo Cadastral Agency, cadastre, property rights register

SUMMARY

Kosovo Cadastral Agency was established in Kosovo in November 2000 through a joint project involving the UN and Norway, Sweden and Switzerland as donors. It was an extensive project, which included the establishing of a new 1st order network, production of orthophotos, a land information system, a system for property registration, training of local employees and institution building. From January 2003 the Kosovars will partly take over the running of the Kosovo Cadastral Agency and maybe start transforming the organisation into a Surveying and Mapping Authority

L'Établissement de l'Autorité de Mesuration et det Cartographie du Kosovo?

RESUME

L'Agence Cadastrale du Kosovo fut établie en novembre 2000 à travers un projet commun entre l'ONU et la Norvège, la Suède et la Suisse comme donateurs. C'était un projet important, comprenant l'établissement d'un nouveau réseau primaire, la production d'orthophotos, un système d'information terrestre, un système d'enregistrement de propriétés, la formation d'employés locaux et bâtiment de l'institution. Selon le plan les Kosovars prendront la direction de l'Agence Cadastrale du Kosovo à partir du 01.01.2003 et après la transformeront en une Autorité de Surveillance et Cartographie.

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1. BACKGROUND ON KOSOVO

Kosovo has been a province in former Yugoslavia until it erupted in an ethnic conflict between the Albanians and the Serbians in the spring of 1999. NATO entered the war and after 77 days Serbia surrendered. On 10 June 1999, the United Nations Security Council passed Resolution 1244 authorizing the United Nations Interim Administration Mission in Kosovo (UNMIK) to begin the long process of building peace, democracy, stability and self-government in the shattered province.

To achieve this goal, UNMIK has been acting as the transitional administration for the region. UNMIK performs the whole spectrum of essential administrative functions and services covering such areas as health and education, banking and finance, post and telecommunications and law and order.

KFOR is a NATO-lead international force responsible for establishing a security presence in Kosovo. This peace-enforcement force entered Kosovo on 12 June 1999 under a UN mandate, two days after the adoption of UN Security Council Resolution 1244.

KFOR has reached its full strength of 50,000 men and women. Nearly 42,500 troops from 38 countries are deployed in Kosovo and another 7,500 provide rear support through contingents based in the Former Yugoslav Republic of Macedonia, in Albania and in Greece.

The war destroyed much of Kosovos infrastructure, for example was more than 300.000 buildings destroyed. When the Serbians withdrew from Kosovo they destroyed or took with them almost everything of value. Archives, maps, instruments, computers etc. are still in Serbia.

Kosovo has now over 2 million inhabitants on 10,908 square kilometres. Self-government was established in 2002 though some important functions are kept by UNMIK. The infrastructure (electricity, water, waste disposal and roads) is still in a bad condition, but the security situation has improved.

2. BACKGROUND TO THE PROGRAMME

At the request of the United Nations Interim Administration Mission in Kosovo (UNMIK), UNCHS (Habitat) carried out a rapid assessment of the situation regarding housing and property rights and property registration in Kosovo in 1999.

The terms of reference for the implementation of the Kosovo Cadastre Support Programme (KCSP or the Programme), is the result of the above process and the specific negotiations for

the implementation and financing of a three-year programme involving the Governments of Sweden, Switzerland and Norway, UNMIK and UNCHS (Habitat).

The main objective of the programme is to develop a well functioning real property and land market, supporting democratic and sustainable development and economic growth in Kosovo.

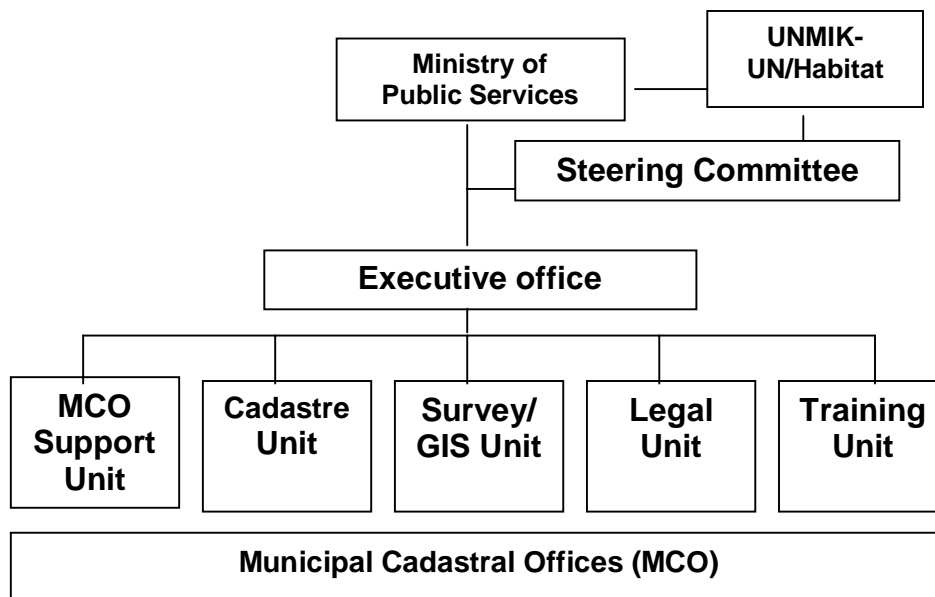
3. KOSOVO CADASTRAL AGENCY

KCA was established in November 2000 as a result of an UNMIK Administrative Direction. This Direction gives KCA the necessary authority in most areas within mapping, surveying, cadastre and geographic information.

The organisation of KCA is established with international and local co-heads of each unit and with both local and international staff within the units. Since KCA is a sustainable agency, local co-heads will be trained to take over within the Programme period.

At the end of 2002 there were 14 international and 32 local experts at KCA and a total of 80 employees.

The organisation used until 2003 reflected the focal points in the donor initiated Programme.



The present organisation is divided between the local functions of KCA and the donor funded functions of KCSP. There will be a clear distinction between the management and activities of the KCA on the one side and the management and activities of the KCSP on the other side. In short the KCA will be responsible for operational activities and the KCSP responsible for development and implementation of the Programme deliveries. The already developed and implemented deliveries will be handed over for operation by the KCA.

4. MUNICIPAL CADASTRAL OFFICES (MCOs)

There are 30 municipalities in Kosovo. Since all cadastral surveying and registering of cadastral information are done by the municipalities it was important to use a lot of resources

to update them on technology and skills. The MCOs employ about 300 persons. There are still many problems that are slowing down the reconstruction process in Kosovo:

- missing data (removed in Serbia during the conflict)
- a ten-years gap of the cadastral workers expelled from their jobs and who therefore have difficulties to cope with new technology
- unreliable electric power
- huge number of customers, unsuitable office-space etc.

5. THE RECONSTRUCTION OF THE CADASTRE

The entire area of Kosovo (10,908 sq.km) was divided into 1298 cadastral zones and the cadastral system is parcel based. The cadastre books have detailed descriptions of the possessor(s) and of land use classes including quality classifications. This information was integrated into a graphical mapping system based on surveying and aerial photogrammetry from 1931 – 1935 and 1951 – 1985. Luckily the data was processed using punch card equipment and it was possible to build a digital cadastre based on the backup of the cadastral records.

5.1 The Textual Database

One of the main priorities of the Programme was to restore the cadastral information and make it available in digital form. The aim was also, to some extent, to integrate textual and geographical data. Major parts of the operational database and original graphical cadastral plans were removed from Kosovo during the conflict.

The Interim Database version 1.0 was a simple read-only database in MS-Access, reconstructed from textual data on magnetic tape obtained from the Electronic Data Processing Facility of Kosovo (EDPK). Totally for Kosovo there were 29 databases containing 1,853,090 parcels and 331,324 possessors (users).

The Interim Database version 2.0 was a read-write database developed in Visual Basic and MS-Access. In this version the MCOs will gradually be able to improve the quality of the data by introducing new information. Old information is archived in a separate database. Updating will be based on information found in MCOs up to 1997, where this information is available, and information provided by the public. All MCOs of Kosovo today have books for registration of the changes since 2000, and all necessary changes are initially registered in the books then entered into the database prepared by KCA.

The training and installation of KCID3.0 is now under installation in all MCOs.

5.2 The Cadastral Plans

Property registration and cadastral mapping were integrated into a unified system. No digital maps existed and most of the updated and original cadastral maps had been removed. The cadastral maps also had Kosovo-wide coverage and consisted of more than 10,000 sheets in scales 1:500, 1:1000, 1:2500 and 1:5000. The most recent maps was from 1989 and the oldest from 1931.

Already in July 2000 KCA started the scanning of cadastral plans received from the Archives of Pristina and the various Municipal Cadastral Offices. The scanning of 10,300 plans was finalised in April 2001. About 500 plans have not been found. The content of the plans vary from plans with only boundaries and parcel number to complete topographical maps with contours.

5.3 Vectorization

The next step was to geo-reference and rectify these scanned cadastral plans so that they can be imported to selected GIS software and delivered to the MCOs together with computers and software. The linkage between the cadastral plans and the textual database will be based on the parcel number.

Linking the cadastral database to the cadastral plan will be an important measure of success regarding the reconstruction of the cadastre and will greatly enhance the user friendliness of the system.

The vectorization process includes the introduction of new software (GeoMedia from Intergraph and GeosPro), a data model and the screen vectorization using snap functions in the software.

The vectorization of cadastral plans proved to be a huge task and to speed up the process part of the vectorization has been out on international tender. The aim is to finalise vectorization of plans in build up areas within the end of the Programme (October 2003).

6. DELIVERY OF SURVEYING AND COMPUTER EQUIPMENT

27 municipalities got one computer with printer and UPS together with Microsoft Office 2000 and the first textual database in March 2001. Additional computers has been delivered to each municipality together with GIS and surveying software year to enable the MCOs to have full capacity to serve their increasing number of customers.

Reflectorless total stations TCR303 from Leica with accessories was delivered to 23 municipalities in May 2001. Additional total stations and levels was distributed in 2002.

7. REFERENCE NETWORK

It was decided to establish a new network based on the existing Gauss-Krüger projection (7th zone) included the scale reduction at the central meridian by 0.0001 (scale factor 0.9999). But this time the system should be based on the International Union of Geodesy and Geophysics (IUGG) spheroid GRS80 (Geodetic Reference System of 1980) as used in the European Terrestrial Reference System ETRS89 and connected to the EUREF Permanent Network (EPN).

32 stations was established and measured with Leica GPS receivers SR520 and SR530 in static mode with duration of up to 9 hours. 23 of the new GPS stations was linked to the existing levelling network of Kosovo. The quality of the new network is among the best in Europe.

A second network based on GPS measurements is now being finalised and a third order municipal network is in the planning.

8. AERIAL PHOTOGRAPHY AND ORTHOPHOTO PRODUCTION

Kosovo is absolutely in need of new digital technical and economic maps. But mapping the whole territory of Kosovo is a slow and expensive process, so it was decided to produce digital colour orthophotos as soon as possible. Due to the weather conditions only 40% of Kosovo was covered in 2000. The rest of Kosovo was photographed in May/June 2001 with the exception of the buffer zone to Serbia and Montenegro.

The aerial photography is completed and films have been developed and scanned by the Swiss Federal Office of Topography (SFOT). Digital colour orthophotos are now available for almost the whole area of Kosovo. Local surveyors of KCA has done most of the GPS surveying of ground control points and points for the digital elevation model.

In the absence of updated maps these orthophotos have become very popular and updates in the urban areas are planned for 2003.

9. TRAINING AND SUPPORT

Training and support both to the local employees at KCA and to the MCOs is of course an essential part of the activities. The utilisation of the given tools will be limited and it will be easy to revert to old routines if the training is not sufficient.

More than 300 has participated in training courses and 200 has received on the job training.

The municipalities have been visited more than 1000 times by KCA staff since the beginning of the project!

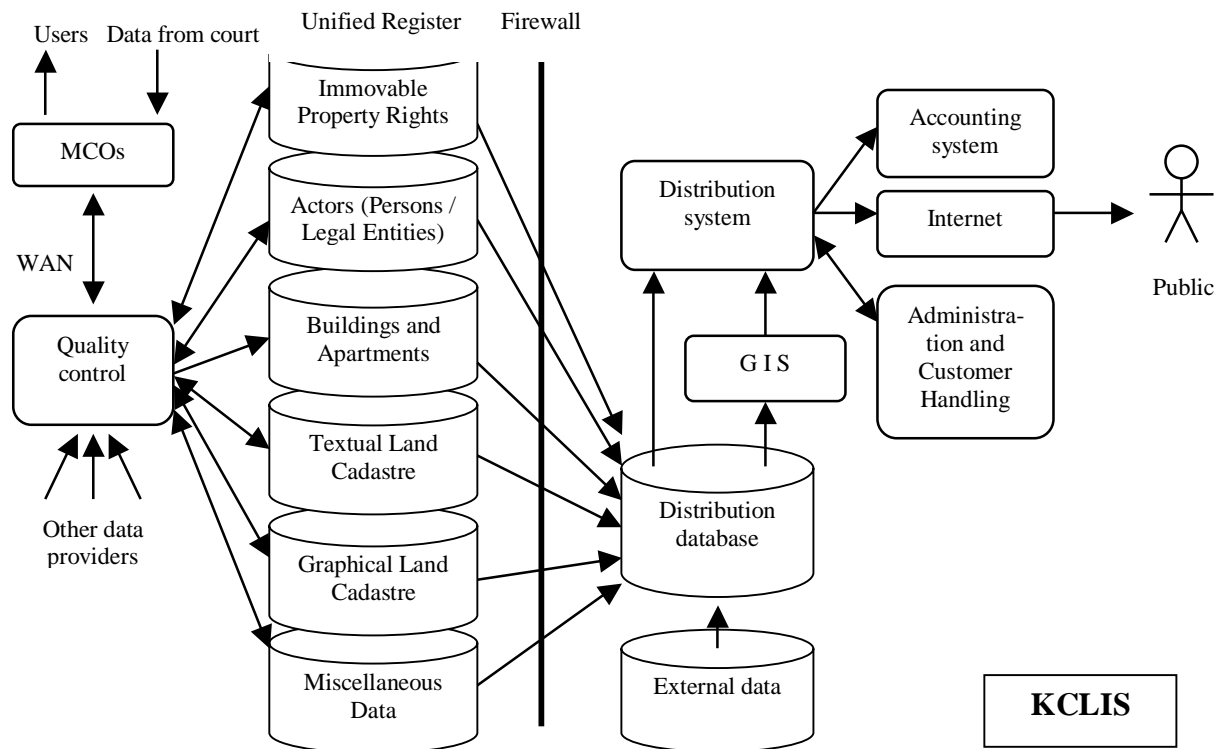
To attain sustainability it is also important to transfer non-technical skills as managing, work and resource planning, budgeting, reporting and monitoring and handling of personnel and organisational issues. Training of municipal directors was carried out last year.

10. KOSOVO CADASTRE AND LAND INFORMATION SYSTEM (KCLIS)

KCA has collected updated textual land cadastre information from each MCO. The textual land cadastre contains information about more than 2 mill. parcels and 0.5 mill possessors.

KCA is also involved in a project for Property Taxation, where information about buildings and apartments are connected to the textual land cadastre.

In the Unified Register, which will be based on SQL-servers, the information about land, buildings, apartments and actors are connected through the Immovable Property Rights Register including the following rights; ownership, mortgage, servitudes and rights of use of socially owned property.



From the above sketch we can see that the MCOs will do the updates and receive data through a closed Wide Area Network. Data from other providers can also be controlled and stored in the Unified Register. Both textual and graphical cadastre information is stored in this database. This information is protected by a firewall and replicated to a separate distribution database. Information from the distribution database and other external databases will be accessible to public on Internet through the distribution system.

The distribution system will accept different type of users, asking for different type of products, through a password system. For example a full package including sketches or maps with textual description produced by the GIS, summary information like different types of statistics or tailored products created on demand. There will also be a customer handling system including accounting and administration connected to the distribution system.

The model in the sketch is the first draft of KCLIS. This system is the final goal, which will be created step by step. The first step was development of KCID (the textual land cadastre), where information delivered by court is updated by MCO. The next step was the Property Tax Register linked to KCID and updated by fiscal authority in the municipality. From this register, and other available registers, we will extract data about actors, buildings and

apartments. We are now entering the third step, design and development of the Unified Register, which is the base for KCLIS.

The unified register will consist of following registers:

- Real Property Rights, which keep records on ownership, mortgages and servitudes on land, buildings and apartments. This can be termed a legal register.
- Actors, which keep records on private persons and legal entities (Id number, name, address, type of actor (owner, possessor etc)). These actors will be connected to land, buildings or apartments in the Real Property Rights Register.
- Buildings and apartments, which keep records on buildings (Id number, Address, type of building, construction year, number of floors, area, etc.) and apartments (Id number location in building, number of rooms, area, etc.)
- Textual land cadastre, which keep records on land parcels (Id number, type of land, area, etc.)
- Graphical land Cadastre, which keep records on vector data (cadastre plans with parcel borders, roads, rivers, etc) and raster data (orthophoto, digital terrain models etc)
- Miscellaneous registers, which keep records on data delivered by different data providers. The model for these registers will be determined in cooperation with the provider when the data is included in the unified register.

10.1 Development plan for the Unified Register

The Immovable Property Rights Register (IPRR) will be prioritised in the development of KCLIS. The legal framework for this register was signed in October 2002. Funding has been established and a software developer has been selected. Development phase A, estimated to 7 months has now started. The phase will include: System analysis, Design, Program development, Program implementation, Training, Acceptance test and Pilot operation. At least 5 MCOs will soon be able to register Immovable Property Rights and print the necessary Certificates, depending on the network capacity in Kosovo.

Development Phase B, the distribution system, is estimated to 4 months. Then selectable information about Immovable Property Rights will be available for public and customers at Internet, regulated by the legal framework for the register.

The total cost for phase A and B, including standard software and hardware, is estimated to 2.1 mills EURO. Estimated to be implemented from October 1st 2003.

10.2 GIS

Kosovo Cadastral Agency is now the main provider of geographical information in Kosovo. At present they are delivering textual cadastral information, digital cadastral maps, scanned topographical maps and digital colour orthophotos.

11. A SURVEYING AND MAPPING AUTHORITY OF KOSOVO?

At present there is one organisation with the local Kosovo Cadastral Agency and the international Kosovo Cadastre Support Programme working together. At the latest when the

Support Programme ends in October 2003 it is possible to develop this central Kosovo organisation further. It is natural to look at the corresponding organisations in Slovenia, Croatia and Macedonia. Slovenia has a Surveying and Mapping Authority and the Kosovars are fascinated with the success of this former Yugoslavian country. Kosovo will be depending on a foreign supported economy and political stability to develop their infrastructure and institutions further. The present Kosovo Cadastral Agency is an important provider to the infrastructure of Kosovo and a Surveying and Mapping Authority of Kosovo might be established within 2003.

BIOGRAPHICAL NOTES

Head of Cadastre in the City of Oslo 1993 – 2000, 2003 -. Cadastral Programme Manager at the Kosovo Cadastral Agency in Pristina, Kosovo 2000 - 2002. Earlier experience in engineering surveying, land, geodetic, hydrographical and quantity surveying. Secretary of FIG Commission 3 from 1996 to 2002.

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