

Scope of Cadastre Reconstruction in the Republic of Kosovo

Alexander SCHMIDT and Murat MEHA, Republic of Kosovo

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SUMMARY

The necessity of reconstruction of cadastral data will be presented and discussed based on the situation in the Republic of Kosovo. Furthermore a definition of the term cadastre reconstruction will be given. The result namely should be a first concept for Harmonising Textual and Graphical Cadastral Data with description of the steps to undertake cadastre reconstruction and/or preparation of tasks for supporting cadastre reconstruction.

The realisation and implementation of the derived methodology should be done in the closest future. However, the methodology should be tested under real situation in the field of cadastre (reconstruction) in the Republic of Kosovo. Furthermore, improvements must be made on the requirements of each new case of cadastre reconstruction.

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1. ABSTRACT

In this paper, the necessity of reconstruction of cadastral data will be presented and discussed based on the situation in the Republic of Kosovo. Furthermore a definition of the term cadastre reconstruction will be given. The result namely should be a first concept for combining (harmonising) Textual and Graphical Cadastral Data with description of the steps to undertake cadastre reconstruction and/or preparation of tasks for supporting cadastre reconstruction.

The realisation and implementation of the derived methodology is planned for the closest future. However, the methodology will be tested under real situation in the field of cadastre (reconstruction) in the Republic of Kosovo. Furthermore, improvements have to be made on the requirements of each new case of Cadastre Reconstruction.

2. DEFINITIONS

Maintenance of Cadastre	All official acts of the land authority for the establishment, continuation and renewal of the cadastre.
Renewal of Cadastre	Renewal of components of the (real estate) cadastre in order to match always the requirements of it.
Cadastre Reconstruction	(Re-)Establishment of the (real estate) cadastre based on massive updating of the cadastral information. Missing information caused by different reasons.

To have a complete cadastre, the cadastral data must be *complete, correct, accurate, reliable, actual, and comprehensive*.

This shall apply in:

- Completeness is more important than accuracy
- Accuracy will be improved step by step
- Eventual errors must be removed-up from the textual and graphical data.

¹ See Disclaimer at the end of the document

3. INTRODUCTION

The availability and timeliness of digital cadastral and registration data is a decisive basis for the quality and transparency of decisions in the administration, politics and economy. Securing of land ownership, planning of infrastructure provision and addressing of locations or points are preconditions for economic and political development of a country. The economic development of their country depends not only on their own economic conditions but also from those in neighbouring countries. In an increasingly integrated Europe, this is a non-negligible aspect. Not only the economy is growing together, the spatial data are more and more to be correlated.

To meet these requirements, the cadastral and registration data have to be kept up to date and consistent. Because of the collapse of the Republic of Yugoslavia and the further fragmentation, the quality of the cadastral and registration data in the Republic of Kosovo is not just refer to as well. The data is not updated on the required level.

Important steps towards digital data storage have been taken and are being taken for several years. Now it remains the last discrepancies between the data to correct. Through a variety of professional assignments in the Republic of Kosovo the author got a deep to very deep insight into the enhanced land-registration system of Kosovo. By identifying more and more information, a kind of detective instinct was aroused. This was even with the rash, to carry out a master thesis in this area.

4. LEGAL FRAMEWORK AND ORGANISATIONAL STRUCTURE

4.1 Legal Framework

Since the year 2000, a new legal framework was started to be established, continued with the formation of a new state of Kosovo. During this time, several approaches to create a legal framework regarding the handling of cadastral data have been carried out and new laws, administrative instructions and other guidelines have been established.

4.2 Organisational Structure of the Cadastre and Registration System in Kosovo

The Cadastre and Registration System in Kosovo is divided into two levels of responsibilities. On one hand the Kosovo Cadastral Agency (KCA) and on the other hand the Municipal Cadastral Offices (MCO). The organisational Structure of the Cadastre and Registration System is shown in Figure 1. The circumstance of the jurisdiction of two ministries makes it clear that problems can arise quickly with this situation. Clear Objectives and a very high need for coordination is a prerequisite for the functioning of such a management structure.

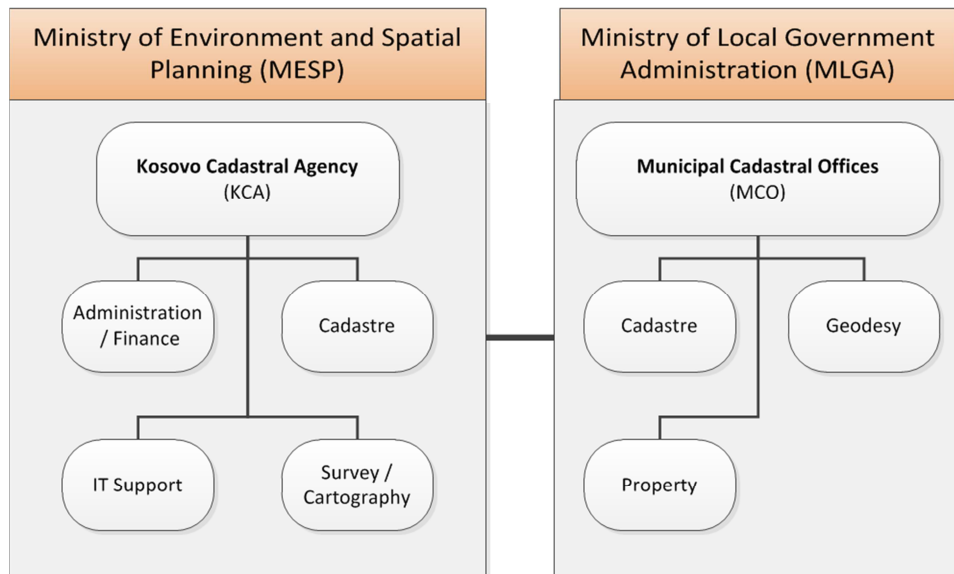


Figure 1: Organisational Structure of Cadastre and Registration System in Kosovo

Kosovo Cadastral Agency

Kosovo Cadastral Agency (KCA), established in November 2000 as a result of an UNMIK Administrative Direction, is a Governmental Agency under the Ministry of Environment and Spatial Planning (MESP). On this background the Kosovo Cadastral Agency was established during the three year Kosovo Cadastral Support Programme (KCSP, 2000 - 2003), financed by the Governments of Sweden, Norway and Switzerland. The main objective of the KCSP was the development and management of cadastral and land registration in Kosovo at a central level. KCA is the authority for Cadastre, Geodesy and Mapping in Kosovo.

Municipal Cadastral Offices

There are actually 38 Municipalities in Kosovo. All the Municipal Cadastral Offices (MCO) are organised with directorates of Cadastre, Property and Geodesy. They are independent entities and organised under the Ministry of Local Government Administration (MLGA). MCOs are responsible for maintenance of cadastre and registration of immovable properties.

5. DATA ANALYSES OF EXISTING DATA

5.1 Data Sources (spot tests)

Selection of investigation areas

The selection of the pilot municipalities was not made randomly. The cadastral data of the following Municipal Cadastral Offices (MCOs) were analysed:

Table 1: List of investigation Areas

Location	Reason for selection
Ferizaj	Ferizaj was selected since this MCO was renovated as part of a World Bank project in 2008 and in the meantime has been equipped according to new standards
Istog	Istog is well known for having many old documents from the last century
Peja	In contrast, the neighbouring municipality Peja does not have such a comprehensive archive of old cadastral documents.
Prishtina	Is the capital of the Republic of Kosovo.
Mitrovica	Mitrovica is located in the north of the country.
Hani i Elezit	Hani i Elezit is a new municipality which was established in 2010.
Gracanica	Gracanica is a municipality close to Prishtina and is under local ethnic minority administration.



Figure 2: Location of investigation areas

Available Data

For the quality analyses, the following materials were used:

- Digital Orthophoto Maps (DOM)
- scanned and georeferenced maps in digital format
- digital Vector Maps (VM), derived from the scanned maps
- Registration information out of Kosovo Cadastral Interim Database (KCID) and Im-movable Property Rights Register (IPRR); partly as printout and partly in digital format as Excel-sheets
- analogue cadastral maps
- analogue sketches, partly additionally with update cases
- protocols of tachometric measurements

Collection of Data

During timely different visits in the MCOs, more and more data were collected. Digital data were copied on a memory stick. Analogue data, e.g. old cadastral maps were scanned with a portable A3 scanner. Furthermore, investigations took place whether different copies and versions at different times of graphical documentation (maps, sketches) are available.

5.2 Method of Quality Analysis

At first, it was planned to undertake the analysis separately in two parts.

Part one for analysing the cadastral data (graphical & numerical) and part two for the registration data (textual). For both, a course of actions was prepared (see Figure 3 and Figure 4). During the work it stated out, that it will be better to mix both analyses for more efficiency. Results from the cadastral analysis were mixed with results from the registration analysis and vice versa.

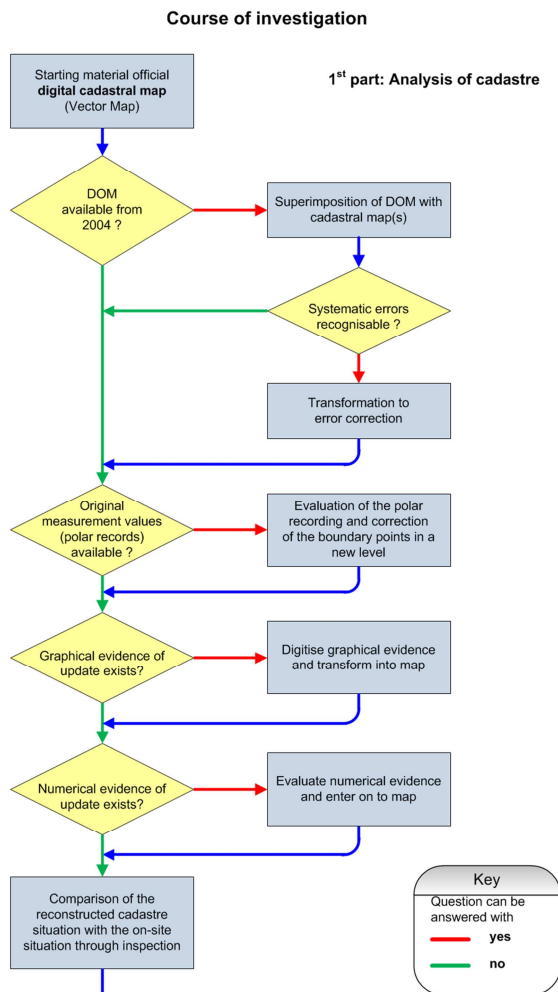


Figure 3: Course of investigation (part 1) [Schmidt, 2011]

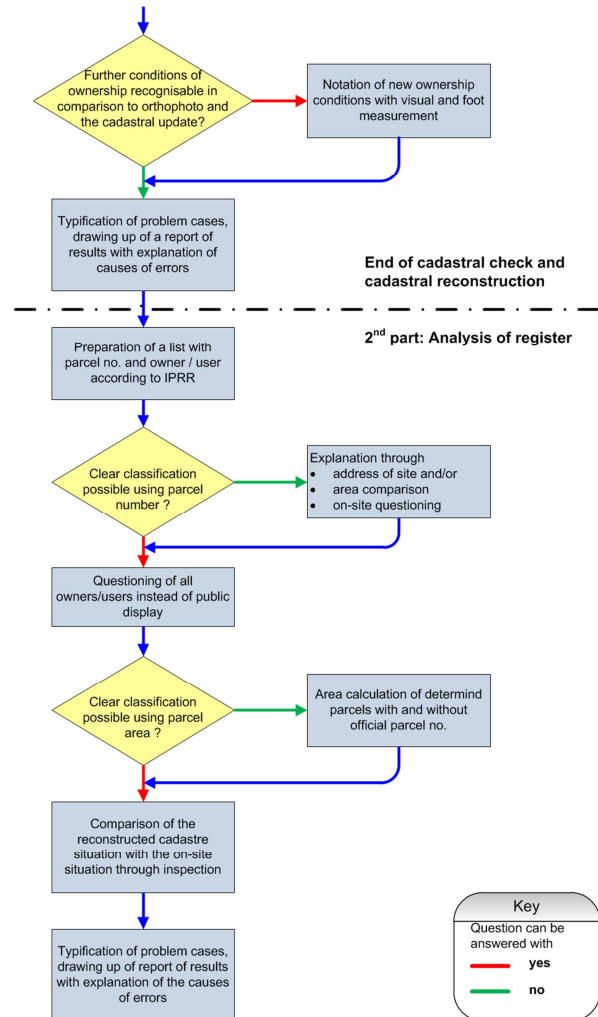


Figure 4: Course of investigation (part 2) [Schmidt, 2011]

5.3 Evaluation of existing cadastral Data

Even at the beginning of the evaluations turned out that, separate examination of graphical cadastral data and registry data is particularly not effective. A combined analysis of the documents brought a significant increase in effectiveness and information content.

The graphical information was compared with the alpha-numeric data in relation to:

- Presence or completeness of the documents
 - Number of parcels in the graphical evidences
 - Number of parcels in the textual evidences
 - Number of parcels that are not recorded (documented) in the registries, but exists in the locality
- Examine the possibilities and conditions for a possible cadastre reconstruction

6. CADASTRAL DATA

6.1 “Historical” Textual Data

Bormen

Bormen is an early collection of owner and ownership information. It was in use until 1997. In the time period between Bormen and KCID, textual data was registered only in analogue books.

KCID

The Kosovo Cadastral Interim Database (KCID) is a textual database for storing information about parcels and the responsible owners/ possessors. It was built out of available punch cards in 2001. The information of the DB is based on surveying and aerial photogrammetry from 1931 – 1935 and 1951 – 1985. The first version of the DB was a simple read-only DB in MS-Access format. Version 2 was a read-write DB developed in Visual Basic and Access. This version was updated through maintenance and entering of information provided by the public. Old information is stored in a separate table of the database.

KCID contained only information about land parcels and possessors to land, but information about building was registered as land use (land under building). Data from KCID was migrated to IPRR during 2006.

IPRR

According to the Law on Cadastre, KCA had to establish an Immovable Property Rights Register (IPRR). IPRR is the follow-up of KCID. It is centralised installed on KCA server(s). Most of the MCOs have access to the databases via a connection over the government network. This system started in 2003.

6.2 “Historical” Graphical Data

Analogue Maps

Cadastral information normally is “stored” on analogue maps. The first cadastral maps were produced between 1924 and 1935 by using tachometric measurements. Later on in the period of 1953 till 1956, the maps were based on stereo-photogrammetric processing. During the 1970’s the next generation of maps were produced.

Digital Vector Maps

The digital Vector Map is based on the existing and available analogue cadastral maps. They were scanned, georeferenced and vectorised. The results of this process are digital vector maps, which are under maintenance by GeoMedia applications.

6.3 New System (Graphic + Text)

Up to now, the cadastre and the registration are handled in two systems, one for graphical, and another for textual data. Both are not linked automatically to each other. In view of NSDI and Land Administration it is necessary to combine both systems [Meha, Laarakker, 2011]. Therefore the new Kosovo Cadastre Land Information System (KCLIS) has been developed. Currently the development for the textual part of the system is finished, but the part for the graphical database is still to be developed.

The main goals of the graphical system are:

- appropriately integration of registration data (textual) and cadastral data (mainly graphical)
- improvements during maintaining the data (registration and cadastral) at the same time
- simplification of data transfer (import & export functionality)
→ better support of the private sector (licensed surveyors)
- establish the linkage between the data in one unified system

7. REASONS FOR CADASTRE RECONSTRUCTION

Reconstruction of cadastral information is based on the article 29 of the new Law on Cadastre (2011) [Republic of Kosovo, 2011]. Of course always cadastre needs to answer the main question:

WHO owns WHICH spatial unit and WHERE it is located?

for the spatial unit as, e.g. parcel, building or part of a building.

Reasons for cadastre reconstruction are based on technical respectively legal framework in order to consider new aspects of Land Information Systems.

7.1 Technical and legal aspects

During the war the cadastral documentation were brought to Pristina for selection. Selected documents were transferred to Belgrade; unselected documents remained in Pristina. After the war, the remaining documents were transferred back to the competent MCOs.

Reasons for the technical lacks are different. Up to now the following lacks are known:

- Some maps with updates of the period up to 1999 were brought to Serbia,

- Sometimes the MCOs did not use the cadastral model in the required official file format (ITF, INTERLIS Transfer Format),
- Sometimes updates were generated with various software applications.
- Shape and/or size of parcels were changed between neighbours based on their agreement but not registered in the cadastral data.
- Some cases were carried out without updating the cadastral map
- Land parcels were sold off without registration of the new owners.
- Some Selling/Buying contracts were made directly but not legally contracted.

7.2 Objectives

Cadastre Reconstruction is aimed: [KCA, 2010]

- To reconstruct existing legal parcels by formation, presentation and registration in graphical part of all parcels that are registered in IPRR.
- To formalize (legalize) informal parcels by formation, presentation and registration of cadastral parcels in graphical part and in IPRR. These are the parcels which citizens/owners have formed based on some document or direct agreement. Neither registered to IPRR nor in graphical part.
- To survey objects which include measurement, formation of buildings and parts of buildings and their registration in IPRR.
- To update all cadastral and property data for IPRR and in the graphical part of cadastre based on legal documents in force.
- To solve or report the problem, in the cases where there is inconsistency between lawful owner (the one who is registered in IPRR) and actual possessor (title holder) of the property, and between legal area of the parcels registered in IPRR and technical area in graphical part.
- To define state-owned, socially-owned or publicly-owned properties as well as illegally occupied properties during reconstruction process.

8. CONCEPT FOR COMBINING TEXTUAL AND GRAPHICAL CADASTRAL DATA

Out of the results of the analyses a first workflow for combination (harmonisation) of graphical and textual Cadastral Data were derived. The figures should be self-explained, so no additional explanations are given here (Figure 5).

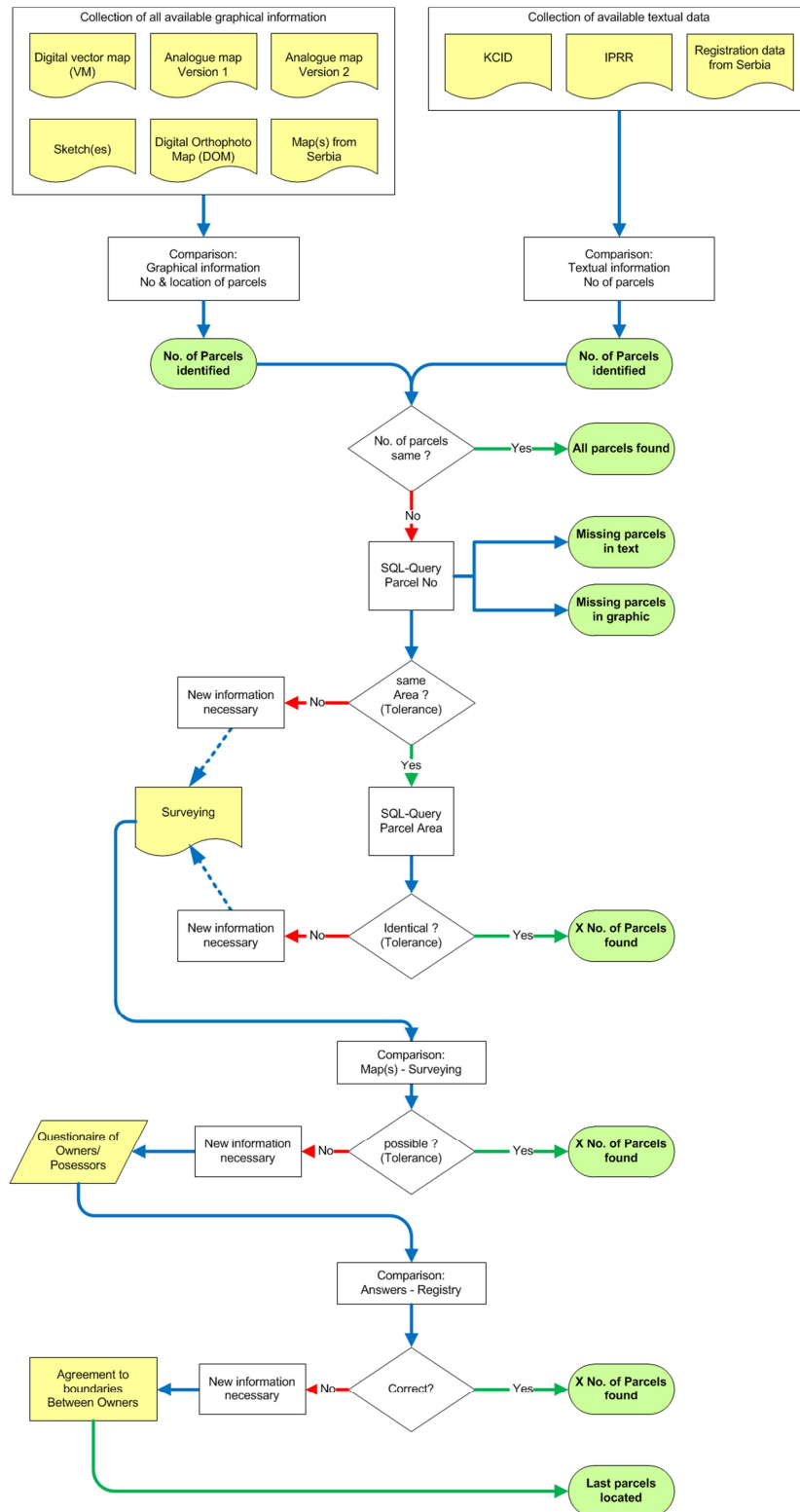


Figure 5: Concept for harmonising cadastral data

9. CONCLUSION

9.1 Findings

To fulfil the principles of the cadastre (under the point of view defined by the German cadastre system), it is essential, to use all the available documentation for the cadastre reconstruction. Only then, the confidence in the cadastre and registration will be established and can be maintained.

Cadastre Reconstruction is necessary. It is the basis for systematic updating of the cadastre and registration. The question is only, which accuracy is necessary. It must not be specially emphasizes that the reliability of cadastre and registration is beyond all question. A spatial unit, e.g. parcel, can only be registered in case, the cadastre is the documented evidence of the spatial unit.

The Republic of Kosovo has 1301 Cadastral Zones. Those which have a high percentage of discrepancies between textual and graphical data have to be reconstructed. This systematic method of reconstruction of cadastre must be undertaken besides the daily update procedures in the cadastral offices. The reconstruction must be done as fast as possible to guarantee the reliability of Land Administration in Kosovo for the future of the Republic and their inhabitants.

9.2 Outlook

The next steps in implementing the presented method would find the practical implementation in a test area or in a cadastral zone which is going to be reconstructed in near future. Previously a database for the identification of existing cadastral data has to be created for the collection of all relevant data. This is not only a valuable aid during a CR, but also for the daily work of professionals in the KCA and the MCOs. Moreover, this will be a milestone towards a service-oriented Land Administration system in Kosovo. In addition, the economic development with the updated data of the land and property rights, at all country will be influenced positively.

DISCLAIMER

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BIOGRAPHICAL NOTES

Alexander Schmidt

Is Technical Advisor at the GIZ – Land Management / Cadastre Project in the Republic of Kosovo. He performed his Master Thesis in 2011 at the University of Salzburg, Austria during his distance study in the UNIGIS network. The theme of his Thesis is close connected to this article.

Before his actual activity he was located at a consulting company in Leipzig, Germany. During his tasks as consultant, he performed a couple of missions to Kosovo to analyse the situation in the cadastral and registration system of the Republic.

Prof. Dr. sc. Murat Meha

Is the Chief Executive Officer of Kosovo Cadastral Agency, at the same time lecturing as a professor in Prishtina University. He has published many papers in prestigious publications, participated in many symposiums, congresses etc., with scientific and professional presentations. Active participation in international associations and different institutions for Survey, Cadastre and Land Administration as in: FIG, EuroGeographic, WPLA, CELKCenter ICC, FAO etc. He has high experience in survey, Cadastre, Land Administration and Land management. Membership of Professional Associations: Kosovo Association of Geodesy, FIG.

CONTACTS

Alexander Schmidt, MSc (GIS)
GIZ – Deutsche Gesellschaft für Internationale Zusammenarbeit
Rr. Anton Cetta Nr. 1
10000 Prishtina
REPUBLIC OF KOSOVA
Tel. +381 (0)38 233 002 – 311
Fax + 381 (0)38 233 002 – 176
Email: alexander.schmidt@giz.de
Web site: <http://www.giz.de>

Prof. Dr. Murat Meha
Chief Executive Officer
Kosovo Cadastral Agency
Archive Building
10000 Prishtina
REPUBLIC OF KOSOVA
Tel. + 381 (0)38 512 353
Fax + 381 (0)38 512 356
Email: mmeha@yahoo.com
Web site: <http://www.kca-ks.org>