CADASTRE: in 48 different language

Cadastre, Kataster, catastro, кадастр, مصحم, 地籍冊, 土地清冊, cadastro, Cadaster, catasto
cadastre, 本当の財産の所有者を示す許可, 토지대장, kataster, 오작. κτηματολόγιο, cadaver, pozemková kniha, kadaster, 자작부적서, cadastru, katastar, kadastër, kataster, καδαστρο, katastroa, kadastr, katastr, katastr, katastro, Katastro, katastaxi, katastro, Katastro, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, katastr, 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FIG - Cadastre 2014 vision;

FIG which our country is related as a member, developed a vision statement in 1998 with also the contribution of our country.

This vision as a summary;

• Cadastre 2014 will show all the legal status of the land including public rights and restrictions.
• Cadastre and land registers will be evaluated together.
• Cadastral cartography will be replaced with cadastral modeling.
• Pen and paper cadastre will be disappeared.
• Cadastre 2014 will be highly specialized and public-private sectors will work together.
• There will be cost recovery in Cadastre 2014.

(Kaufmann ve Stoudler, 1998).

New Agenda

..Cadastre 2034 ....!!

Cadastral Parcel-based Property Rights
should be modeling Three-dimensional (3D)

- Rights of views,
- Animal rights,
- Hunting and fishing rights.
- The rights of season,
- Protection of rights,
- Planting the rights,
- Wind rights,
- Environmental rights,
- Contact with soil,
- Yet unidentified rights........

........ Complex Property Registration
RRR’s
Rights
Restrictions
Responsibilities

In some countries which started to be discussed, but the concepts that exist in our legislation.
NATIONAL SPATIAL DATA INFRASTRUCTURE (NSDI) (Parcel Based)

INTEGRATED LAND & CADASTRE

GEODESIC NETWORK

Ankara Control Center

User

147 CORS Stations covering the whole country (including Cyprus)

Working Principle of the CORS system

Position measurement in cm accuracy within a few seconds in the field are carried out.
The Geodesic network was established in accordance with the system used in Turkey.
How should the land registry and cadastre data, that fit the users need?

- It must be digital. (In metric system and universal)
- It must be updated.
- It must be produced in accordance with surface triangulation network.
- It must be in accordance with Large Scale Map Production Regulations.
- It must be accurate and comprehensive to fulfill the needs of the Development, Expropriation and similar projects.
- It must reflect the ground, information system and exiting maps must be same.
- It must be legally valid.
- Renewal and updating must be done in accordance with Second Cadastre concept.
- **should be three-dimensional (3D)**
- It must produce Base of the National Spatial Information Systems (NSDI)
  (This is the new duty given to TKGM in 2005 with the changes in 3402 numbered law.)

There are more than fifty disciplines and sectors involved in producing or using Land Registry and Cadastre data.

This kind of cadastral data **not fit for users need**
The results of the cadastral data do not fit for users need?

- Boundary disputes,
- The long lawsuit,
- Obstacles in the property-based investment projects,
- Urban and rural planning in deadlock,
- Economic Losses,

Legal Basis of Cyprus Cadastral Renovation Project

CADASTRE LAW FOR TO INCREASE GOVERNMENT REVENUES
(July 5, 1880), Chapter: 327

Was amended in 1949;
«CADASTRE LAW FOR TAX» Chapter: 224

"IMMOVABLE LAW" (Usage, Registration and Appraise) as changes Ordinance description (3/1960 and 7/1978 and replaced by amendment No. 18/2006 and the combined figure)

Principles in the Technical Specifications of tender ......!

In Southern Cyprus, very similar work was done within the "Resurvey Project";
The same law is used as a legal basis and Chapter 224.

Some changes were made to the Law on Cadastre in 2006,

Base of Cadastral Systems are same, Projects are very similar,

Maps and documents, exchange of information made by the official way, published reports on the internet and has benefited from the experience,
History of existing system and present situation

The roots of property structure in Cyprus are based on mainly Ottoman Empire which dominated the Island between 1570-1878.

In 1878, Cyprus was dominated by British with an agreement.

The land classification of the whole island and first property mapping with the aim of tax were done with methods such as simple triangulation, chain, plan table etc. in this period.

Property registration system was also started to be established in this period.

The cadastre of Cyprus was done between 1904 and 1960’s by British, in various stages, using different methods and accuracy.

Only the blueprint copies of these maps are available and most of them are deformed and torn.

Measurement, calculation, benchmark and coordinate values are not available. Because of this existing maps are considered as graphic maps.

As these maps are the only available source of cadastral data, municipality works, city planning, expropriation etc. works are attempted using these maps.

There has been border violations because of allocation of land and parcels given to the holder of rights, without a Precise boundary application.
Cyprus Geodetic Reference System 1913-1915
Map Projection: Cassini
Reference Spheroid: Clark 1858

Existing cadastral maps

Dr. Elikios Elia
**Old cadastre maps and production technology**

Before starting the work, evaluation of the maps and registration status which will be important.

Because there is a need to protect the information and rights defined by that information and storing and retrieving the same information using new and modern technology.

Because of this, renewal work requires knowledge and experience.

Holder of the rights must be informed about the renewal work and understand the nature of the work to be carried out, the need to work together, protection of current legal rights and the main steps of this work such as public display, objections and how objections are resolved.

Even though old maps and registrations are accepted as the only legal basis, it is important to understand the accuracy, requirements, methods and technology used at the time they were produced.

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**Measuring chains and tools used between the years 1904-1930**

Some units used TRNC

1 inch = 2.54 cm (1/12 feet)
1 chain = 1 foot = 30.48 cm
1 acre = 4 Evlek = 14,400 ft² = 1,338 m²
1 Evlek = 3600 ft² = 334.5 m²
1 m² = 10.76 feet²
Plan table used between the years 1904-1930

Dr. Elikos Elia
Made by drawing directly on the map sheet attached to the plane table, Measurement card, land use sketches, field sketches, coordinate calculation and similar documents are not available.

There are many sources of error in the production of these maps:

While doing the renewal work, it is necessary to know these sources of error well and do the evaluation according to the conditions which these maps were created in and what kind of errors might have been made.

Some structural error sources of measure method and technology used

Random errors and errors that can be calculated in distance measures

- Tape standard distance errors
- Slope and topography
- Stretch and sag
- Temperature

- Deviation from direction (deviation from alignment)
- Misread measurement (tape length counting error)
- Zeroing (in the beginning of tape)
- Product length obstacle
- Reading and writing errors
- Personal and other rough mistakes

- Generalization errors
The human eyes has the most medically 0.2 mm separation ability.

Made by hand in the drawing is regarded as the error limits

The best accuracy for 1/2500 scale graphical map; 0.2 mm * 2500 = ± 0.50 m

When adding the errors of Production, digitization, conversion, edging, etc.; we can talk about the limits of error, ± 2.00 m

This means that smaller scale than 1/10 000.

«The digitization of the existing map», is it sufficient for the digital cadastre ??

Such kind of data transfer is performed only for inventory, unqualified cadastre is a problem, instead of being an solution.
The cadastral systems recognizing «General Boundaries»
- the ground border marker is accepted as legally valid
- For this reason, parcel boundaries are defined as permanently.

Available documents are legally essential.
(available documents for precious paper)

Article 719 (previously 645) of civil code;
"the boundaries of the immovable is determined by land register plans and boundary signs on land. If the land register plans and signs on land do not match each other, boundaries in the plan are legally valid."

In Turkey, state is Generally Responsible for the regulation of the land register.

If the immovable owners and the right holders any loss of rights because of a change in the land register or cadastre plan without their agreement or a court decision, this loss will be recovered from the state.
**Why and when is renewal necessary?**

- If one or more of the following causes exist in the current cadastre maps, “Cadastre Renewal” is justifiable:
  - deficiencies resulting from a technical reason,
  - Loss of relevant detail or record,
  - Deficiency detected,
  - differences with real ground boundaries.
- May be like Usage errors, Measurement errors, Drawing errors, Calculation errors, Surface area errors,
- Land use might have been changed,
- In such cases, applying cadastre renewal principles, means correction process is legal.

**Boundary definitions in renewal**

- **Fixed boundary:** The certain boundary which exist in the ground and has not been changed since the cadastre.
- **Valid boundary:** Boundary which is created according to the cadastre technical documents and in case of not finding any error in the amendment process measurements.
- **Valid like boundary:** The boundary created by the owners and other related people without any conflict.
- **Indefinite boundary:** Boundary which does not exist on the ground and is created according to the balancing plan
- **Contentious boundary:** Boundary which even exist on the ground but is a subject to conflict between the parties.
- **Changeable boundary:** Boundary which exist on the ground and is adjacent to the places owned and controlled by State.

Technicians are obliged to see these boundaries, to interpret and to measure accurately on the field.
Between related ministries from TR and TRNC, there were protocols signed between 1998 and 2008 aimed at the “Renewal activities”.

As described in the protocols, the renewal of TRNC’s cadastral maps and converting the land registers to automation practices were started in 1998 firstly by public officer assigned from Turkey. However, with in 11 years only 21 thousand parcels could be renewed.

To speed up the process, at the beginning of 2013, a tender for renewal work was bid by TKGM (General directorate of land reg.&cadastre of Turkey), with involving 3 packages and 125 thousand parcels.

Project Duration was 1 year and project cost was approximately 2.5 million USD.
Cadastral Team: Technicians, owners, neighbors, expert witnesses and muktar identifies the parcels. Boundaries are marked and measured by the team together

TASK: updating Existing cadastre for to establish NSDI

Presentation of the project in the press and the public; create awareness
• Announcement of study area,
• The press and TV announcements,
• Information meetings for Headmen and expert witnesses,
• Announcements and meetings in a public place,
• Face to face interviews In the village,
• NGO briefings,
• Project groups and licensed surveyors meetings,
• Briefings for the Ministry and members of the government and politicians.
President of the Assembly of the TRNC
Dr. Sibel SİBER with field team

TRNC Deputy Prime Minister
Serdar DENKTAŞ with field team
TRNC Prime Minister
Mr. Ozkan YORGANCIOĞLU after Project Briefing

President Mr. Dr. Derviş EROĞLU,
Public Works and Transport Minister. Hasan TAÇOY, project briefing.
The main points was built as "pillar"

GNSS and levelling Network
(Geodesic Surface Network Statistics)

It covers the whole TRNC.

4 CORS (GPS Stations which do continuous measurements) are available.

Based on these, a total of 105 ground control points were established.

37 C2(SGA)-concrete pillar,
68 C3(ASN)-Ground stones were installed.

TRNC Densification Network Accuracy:
Determining the spatial coordinates 1.55 cm
Accuracy in height determination 2.08 cm
(10.6 cm in Turkey)

Within the borders of TRNC, at all hours of the day and night, the height and the coordinates will be able to be determined instantly in seconds.

It is open to all Public and Private sector users.
Land records: from automation

Raster data: from existing cadastral maps
Vector data: from existing cadastral maps

Each parcel corner was measured in the field with GPS and electronic instruments
Orthophoto images were used to verify field measurements before they were transferred to the automated record.
EXAMPLE: A newly created, digital cadastral maps and ortho-image
New maps: ITRF 96, metric, digital, legally valid, will be the base map for NSDI.
The results which will be obtained with the completion of the project:

Project will transform **Digital, Integrated Land Reg. & Cadastre** in TRNC.

It will be as a **base of Universal NSDI**

The cadastre maps and property registrations which were formed by British measurement system are becoming available in metric system, updated, in digital formats and legally valid to be able to be the base for land related investments.

Operations such as urbanization, development, expropriation, consolidation, urban transformation will be much more economical, effective and less time consuming.

Property cases will decrease substantially.

Renewal work will also help the development of related regulations in TRNC at the same time.
Sustainable land management projects;

For the well functioning (NSDI) «National Spatial Information System», we will need a reliable and integrated land registration and cadastre system.

Turkey, has such an internationally recognized system although there is still more work to be done in both public and private sector.

The TKGM "Cadastre Modernization Project" has been a very successful and was in part instrumental in making this transformation.

This experience and the lessons learnt have been applied to the work being carried out in TRNC.

TARGET;
Removal of structural errors in cadastral maps and property records; digital integrated Cadastre and Land Registry has been targeted.

Cadastre renovation work covering about 125,000 parcels has been completed and delivered. A new tender for a further 140,000 parcels has been prepared.

Cadastre renovation work covering the remaining 55% of TRNC is being planned.

Cadastral renewal process is a technical job. Protecting property rights and making this information available to everyone is a legal requirement.

If you do not establish a well functioning NSDI, You will get always two rails !!!!!!!!.

(Dr Ayşe Yavuz Özalp)
Thank you for your attention