

Renovation Studies in Turkey Cadastre; Reasons and Projects Results

Şaban İnam, Mehmet Ertaş, Şükran Yalpır, Aslı Başarır, Mustafa Akca; Turkey

Key Words: Cadastre, renewal, digitising, second cadastre

ABSTRACT

Nowadays, facility cadastre is nearly to be completed but renewing and updating studies are still poor. Nowadays partially, renovation is done in a technically and loyally, handed as a whole, way but it does not interest in ownership status and keep to first cadastre datas. In this situation, performed processes are redrawing of the very old screw plates more than renovation. Regulations should be done to change these studies into numerical datas, which are far from multi purpose cadastre logic, base plate of ownership based and positional contented data syytems. Necessity of information society is in this way.

In this study, the reason for the necessity of renovation studies in Turkey cadastre in the period of being an information society will be presented; the results required by survey and pilot area application will be shared.

Anahtar kelimeler: Kadastro, yenileme, mülkiyet, ikinci kadastro

ÖZET

Türkiye’ de tesis kadastrosu çalışmalarının tamamlanmak üzere olduğu günümüzde, yenileme ve güncel tutma çalışmaları yetersiz kalmıştır. Teknik ve hukuki bütünü ele alan ancak mülkiyet durumuna dokunmadan, çizgisel paftaların ilk kadastro verilerine bağlı kalarak yenilenmesi yapılmaktadır. Bu durumda yapılan işlemler, yenilemekten çok eski paftaların yeniden çiziminden öteye gitmemiştir. Çok amaçlı ve çağdaş kadastro mantığından uzak olan bu çalışmaların, en kısa zamanda mülkiyet tabanlı ve konumsal içerikli bilgi sistemlerinin altlığı olabilecek sayısal veriler haline getirilmesi için gerekli düzenlemelerin yapılması gerekmektedir. Bilgi toplumlarının ihtiyacı da bu yöndedir.

Bu çalışmada, bilgi toplumu olma sürecinde Türkiye kadastrusunda yenileme çalışmalarına neden ihtiyaç duyulduğu ortaya konulup; yapılan anket ve pilot saha uygulaması ile ulaşılan sonuçlar paylaşılacaktır.

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1. INTRODUCTION

Although cadastre had been serving as the service of creating data base plate since from the era which it was started to be produced till a soon time, in our day it is a mission for it to collecting, stocking and representing the continuous data for multi purpose uses whenever it is necessary. It is a must for the modernization, according, developing and supplying the changes for the specifications of the numerical dynamic maps which constitutes the data foundation of the information systems.

In Turkey cadastre, it is still a problem to have cadastre maps which are still legally valid but do not reflect the up-to-date and far from usage technically. Until today, the studies which are focused on "finishing country cadastre" are not let the enough opportunity for the studies of solving the existing problems. It is a must to make a "renovation of existing cadastre" for supplying standardization, index, legal situation defined numerical datas of the existing old and unfunctional lineal map indexed base plates. This necessity is a vitality for involving the being an information society and process of "sustainable land management". The studies which are done nowadays, are like "healing the lineal cadastre maps by digitizing" instead of renovation in cadastre. However renovation concept must be fictionalised like "within the second cadastre logic, reproducing of ownership and all datas related in a way to answer necessity of society and information systems"

2. EXISTING SITUATION OF TURKEY CADASTRE

Turkey has started to cadastre studies with 05.02.1912 dated Emvali Gayrimenkullerin Tahdit ve Tahriri Hakkındaki Kanunu Muvakkat Law; but after that it could not be continued because of the Balkan War, World War I and Independence War. Soon after the establishment of the Republic, studies have started again in 1925 with 658 numbered Cadastre Law; and later on it is maintained with 1934 dated 2613 numbered Tapu Tahrir Law. Cadastre studies are still conducted according to the 5304 numbered law, different 3402 numbered Cadastre Law decisions.

Cadastre systems which are classified as financial, juridical, and multi purposed according to the content of the application, are used in different structures regarding the judicial and political structures of the countries. Nowadays, the cadastre system which is applied in Turkey is judicial cadastre (Ercan1997). In cadastre applications a very fast drifting is observed from financial cadastre to judicial cadastre and from judicial cadastre to multi purposed cadastre.

Turkey cadastre, maybe planned as a foreseeing cadastre in the time that it was fictionalised, but it is not achieved to finish the cadastre until today and changing it into a information system which is proper for today's technology.

In our day, contemporary cadastrals are developed proper techniques for updating, keeping alive and renewing their datas if necessary. As to Turkey cadastre must renew a big part of the required datas (around 60 percent) in 85 years and convert it into valid format that defined in

spatial information systems and juridically valid.

Because Turkey cadastre wants to reach level of contemporary cadastres regarding the FIG's definition of "Cadastral is a public service, which consist of registers and big scaled maps, real estates which are divided as administrative units; conducted by cadastre organisation, shows in the way that judge, public management, economy and statistics desire." And Turkey wants to integrate existing cadastre system with "Cadastral 2014 Outline Programme" (Erkan2001).

In Turkey, regarding the datas of state planning organisation, there is 417.000 m² area in Turkey to be registered in cadastre. 40.000km² of this area is urban area (17994 avenue), 377.000km² of it is rural area (34601 villages) By 01.11.2010 regarding the datas of General Directorate of Land Registry and Cadastre, realization rate in the studies is given in the Chart 2.1.

In the 719th article of the Turkish Civil Code; it says that " Borders of the real estates are determined by land title plans and border signs on earth. If land title plans and earth signs do not tie in each other more important one is the border on the plan" So Turkish Law system accepts that security of real estates which are of land registry are provided by maps and maps are subsidiary part of the juridical cadastre. (Köktürk 2002). In the acceptance of plan which bases juridical cadastre, plans must be reified, fully reflecting the floor and applicable to floor any time. But maps in our country have been produced as lineal maps until when Big Scaled Map Regulation established in 1983 and square measure of the real estates are determined over maps with graphical methods. Among the cadastral map which have been produced until today, there is no producing method, map base, scale and coordinate system standard (Sarı 2006).

Chart 2.1 Realization of the studies in Turkey's Cadastre

| | |
|--|-------------------------|
| Total Avenue Amount | 17 994 |
| Finished Avaneue Amount | 17 831 (%99, 1) |
| Number of on-going village | 59 (% 0, 3) |
| Number of remaining problematic villages | 104 (% 0, 6) |
| Total Village Quantity | 34 601 |
| Finished Village Quantity | 33 193 (%95.9) |
| Number of on-going village | 513 (% 1.5) |
| Number of remaining problematic villages | 895 (% 2.6) |
| Total Area | 417 000 km ² |
| Finished Area | 404 490 km ² |
| Remaining Area | 12 510 km ² |
| Realization Rate 97% | |

General specifications of the cadastre maps in our country are like at the below (Köktürk 2002, İnam 1999):

- They are produced in different coordination systems and are not connected to country's triangulation network.
- They do not include height information

- Maps are opened according to “cadastre map” basic, more than screw plate system and there is not a standards in classification systems and screw plate dimensions.
- Land control points like triangulation, polygon, which cadastre maps are importantly sourced, are not take place in area considerably.
- Lineal map is a statical document; it is difficult to follow changes and keep updated.
- There is doubts if the cadastre maps are drawn truly or not; their control is difficult.
- Parcel square measures are generally calculated with values taken from cadastre maps and planimeters instead of measurement values. For example around 15% of the realizations in Turkey cadastre are required by the making photogrammetrically produced 1/5000 scaled topographical maps lineally cadastre; although there is coordination systems in these maps, parcel square measurements are calculated by planimeters.
- There has been important developments in the technique and technology since the day that cadastre maps and measurement values are required. There could not done a study in according specifications of these information and cadastral renovation.

With the lineally produced cadastre maps which have the above qualifications ;

- a lot of details are missed and lost.
- It is not easy and cheap to get back data for relating it with other three dimension datas, after it is put in a map.
- As they are produced in different scale, base plate type, producing technique and in coordinate system, their communication both between them and in other usage areas is weak.

In Turkey until 2006, around 325000 cadastre maps are produced. In cadastre studies, there is 10 different scale and 5 different producing chart technique is used starting from 1/200 to 1/10000 and it is obtained that these maps are drawn to 9 different base plate. (Chart 2.2 and Chart 2.3)

It is obtained that ; cadastre is applied to fullfill the necessity of society, gaining content according to the social changes, as the structure and necessities of the society changes, the extent and index of the cadastre changes, targets and principles of the cadastre changes regarding this content (Özen 1971). It must be among countable aims for today's cadastre to be able to answer the needs in this alteration term, following accord with today's conditions and priorities.

Turkey cadastre, is far from fullfilling multi purposed necessities about spatial with its existing extent and produced datas. Because in our day, contemporary expectations by the development of information technologies makes it necessary to be specific to answer multi purposes of data about the land, social and technical necessities reliability, updating and an easy system to reach datas.

It is foreseen that after the first facility cadastre, the changes occur on the floor can only be reflected to the registration by the demand of relevant people. And there is not a juridical must which compels relevant people for doing an operation about registering the changes occurred on the floor. (border change, newly constructed buildings and facilities, new roads etc.) So, "land-cadastre plan" relation is disrupted by time and cadastre plan have been unable to reflect the area.

Chart 2.2 Situation of the cadastral maps according to the producing method (Sarı 2006).

| Item No | Producing Method | Quantity | % |
|---------------------------------------|---------------------------|---------------|----------------|
| 1 | Graphical Technique | 113.499 | 34.92 |
| 2 | Polar Technique | 63.733 | 19.61 |
| 3 | Prismatic Technique | 62.846 | 19.34 |
| 4 | Photogrammetric Technique | 46.191 | 14.21 |
| 5 | Numerical Technique | 38.731 | 11.92 |
| Total 5 different producing technique | | 325000 | 100, 00 |

Chart 2.3 Distribution of the produced maps according to their scales (Sarı 2006)

| Item No | Scale | Quantity | % |
|-----------------------------|---------|---------------|----------------|
| 1 | 1/200 | 206 | 0.07 |
| 2 | 1/250 | 7 | - |
| 3 | 1/500 | 26.688 | 8.20 |
| 4 | 1/1000 | 95.648 | 29.43 |
| 5 | 1/2000 | 106.584 | 32.80 |
| 6 | 1/2500 | 17.890 | 5.50 |
| 7 | 1/3000 | 30 | 0.01 |
| 8 | 1/4000 | 397 | 0.12 |
| 9 | 1/5000 | 76576 | 23.56 |
| 10 | 1/10000 | 974 | 0.30 |
| Totally 10 different scales | | 325000 | 100, 00 |

2.1 Need for renovation of cadastre

It is possible to define renewing as "updating information and documents about real estates (cadastre plans and land registers) which are in a constant change" (Erkan2001). The concept of updating and keeping the cadastre alive, is understood as renewing and preparing cadastre for information systems. Cadastrel structure in the past, must be adapted to the qualification which is necessary in our day. (Koen1987) The problem of developed or developing countries today is not the lack of information consistently; but to have un interrelated and incompatible land information. It is not necessary to have a lot of information but, standardised and multipurpose datas. All these datas should be updated consistently. Cadastre, which connects land and human, must be assessed as, by thinking the opportunities and necessities of the country forehand, defining the information to be included in cadastre system in proper standards and representing them to the users in a information system logic as a cadastral

renovation beside being contemporary.

Primary target in data creating for information systems is institutive target; numerical cadastre maps, digitising cadastral maps which have original dimensions and transferring the land registration information about these maps to the digital media in information system logic, and so making real estate inventories relating these datas with the help of informatic technologies and creating institutive decision mechanisms, determining the defaults in the datas, transforming datas into information and updating and keeping alive these information which are on the computer database. But Turkey Cadastre;

- Map producing techniques do not supply the required sensitivity
- Cadastral base plates are rub off and lost the currency.
- Limitation in the areas which renovation with the aim of updating, digitising etc. processes.
- That existing cadastral datas' being lack of qualification, proportion and currency which will be base plate for spatial information systems.
- Old cadastral maps do not have required positional accuracy as being prepared by scaling techniques far from today's technology.
- Cadastral data base reference system is in ED-50 system, in another project MERLIS (Earthquake Terrestrial Information System) reference system ITFR (International Terrestrial Reference System) defines the sytem, so using more than one database together.
- The existence of cadastre parcels edging, spaces between parcels and embarking.
- Having matching problems in land registry and cadastre parcels because of insufficient and deficient data.
- Unable to define the topology rules which are necessary to be in database for the usage as base plate in the spacial information systems. (for example rule of edging of parcels, not to have embarking rule, not to have space rule)
- All datas are produced in CAD (Computer Aided Design) formats but they are not produced in information system logic.

These problems should be overcome. For these reasons there is necessity for the renovation of the cadastre.

3. STUDİES ABOUT RENOVATION OF CADASTRE

3.1 Studies within the scope of renovation law

In Turkey 23.06.1983 dated and 2859 accorded "Law About Renewal of Land Registry and Cadastre" and relatedly "Regulation About Renewal of Land Registry and Cadastre" studies are conducted by TKGGM. It is foreseen to renew the maps which are insufficient because of technical reasons, lost applicability, default or unreal with borders of the area. But facility cadastre studies and inadequacy in the renovation statute, left these studies in a confined space.

3.2 Alternative Changing Process for the Renovation Studies

According to the Cadastre Law which is in charge, real estates which are determined juridically and registered to land registry, can have some change process through the time. After these changes, square measure, situation of land use, value, borders and neighbour

relationships of the real estates can change.

The changes in the limits, square measure, proprietary right and location of the real estates;

- The applications regarding the 5006/3194 numbered construction law;
- Separating, integrating, leaving to road and sensation from road processes regarding the 15th and 16th articles of the law.
- Land arrangements regarding the 18th article of the law.
- “Rural Area Regulation” regarding the 755th article of Turkish civil code and land consolidation rules
- Land regulation in irrigation areas regarding the 3083 numbered law and application rule.
- Application of 3290 and 3366 numbered laws and 2981 numbered remission of zoning’s 10/b and 10/c articles.
- Application of 4650/2942 numbered expropriation law.
- Making of village settling plans and applications;
- “Private Land Consolidation” studies which will be made regarding 5578 numbered law and differently 5403 numbered Land Saving and Land Usage Law

occur with these.

3.3 Necessity of Renovation Studies in Turkey Cadastre, Existing Renewal Statute’s Application Indexed Analysis

It is necessary to have property information on the map which will be substructure of spatial information systems. For this reason, although the concept of renovation seem like the renewal of the screw plates; it is the renovation of coordinate unity which consist the screw plate. In here the aim, whatever the producing technique of the maps, is to create true, fine and updated information system bases. According to this; renovation in cadastre is; “to determine the content and index of the cadastre according to the existing sources of the country and future expectations; regarding this it is creating parcel based information systems based on spatial and feature datas” can also be defined in this way.

Renovation concept in Turkey could not move forward as reproducing of the cadastre maps which are inadequate because of technical reasons, correction of technical mistakes on facility cadastre and foreseeing that lineal screw plates should be digitized; so in a meaning it could not be more than cadastral correcting.

Chart 3.1 Renovation Techniques of Cadastral Maps

| Renovation Techniques of Cadastre | Law | Regulation |
|---|---|--|
| Digitizing lineal maps | 5304/3402 numbered Cadastre Law (Add.1 article) | 24.11.2006 dated regulation of “digitizing cadastral maps” |
| Correction of Mistakes | 5304/3402 numbered cadastre law (41.article) | <ul style="list-style-type: none"> • 20.04.2006 dated “41. article application regulation” • TKGM 1458 numbered notice |
| Totally renovation of Cadastral maps in content of 2859 numbered law | <ul style="list-style-type: none"> • 2859 numbered law about registry and renovation of cadastre screw plates • legal decision under the heel of 590 numbered law | <ul style="list-style-type: none"> • 21.03.1995 dated regulation of registry and renovation of cadastre screw plates. • Legal decision under the heel of 590 numbered law and Application regulation of 2859 numbered law’s 1. and 2. articles |
| Cadastral Maps Regarding 22/a article of 5304/3402 numbered law | (22/article) of the 5304/3402 numbered Cadastre Law. | 04.12.2006 dated rearrangement of cadastral maps and regulation of making the necessary corrections in land registry |

As seen on Figure 3.2, until 2005, renovation of 2.134.853.000m² area is done. Renovated parcel number is 435.639, and it compromise %1.3 of land registered 32.500, 000 parcels in our country by the end of 2004.

Nowadays, renovation studies includes all cadastre studies done by , graphical, half-graphical, classical, analog-photogrammetric techniques. As a result of a real cadastre renovation, as there will be a harmony between the past and existing information, it will be solution for technical, juridical, economical and political problems that country cadastre faces (Köktürk 1989).

But the renovation which is pointed here, is not the renovation of cadastre screw plates; rearrangement of them in a way that will answer today’s needs in a information, land and coordinate unity. Parcel unity constitutes the screw plates. Registry and cadastre screw plates which are produced in the past; lack of educated staff, lack of technical equipment and as they are produced in a way to answer the needs of the day they produced; fast urbanization, construction plan application and increasing value of real estates for this reason and the necessity for more sensitive measurements and plans, can not respond to today’s necessities (DPT 2001). The only way is to present the cadastre information, which is basic base plate of the development, not on the graphical screw plates but on the digital media and with a faster availability and ease to use.

Chart 3.2 Renovation studies regarding years (Sarı 2006)

| | Applied Area in extent of renovation law | |
|--------------|--|-------------------------------|
| | Parcel Number | Square mea. (m ²) |
| 1985-1989 | 30813 | 155 214 000 |
| 1990-1994 | 36617 | 272 313 000 |
| 1995-1999 | 154877 | 715 005 000 |
| 2000-2005 | 213332 | 992 321 000 |
| Total | 435639 | 2 134 853 000 |

With this aim, it must be based upon country coordinate network, and multi purposed for meeting the needs of the today's information systems. In this structure; the definition of renovation is to define the extent and index of the cadastre and studying for determined spatial and featuristic datas. Main aims of the existing Cadastre Renovation System are;

- computer supported studies and **base** for automation,
- **standardization** for a better change of the datas,
- **connected** wit applications of the users,
- and it must be more **economical** (Köktürk 1996).

3.3.1 Problems faced in renovation of the Cadastre

Cadastral renovation, no matter when it is produced, it must be aimed to make it compatible with today's features by all oportunities provided by scientific and technical developments and technology. Wrong application of the country cadastre because of iregular, changing standardised and old measurement technniques makes it necessary to renew the cadastre. Modernization of renovation cadastre and all possible mistakes, done during the facility cadastre, land registry must be done safely to prevent mistakes. So, property cases which are over ten thousands today, will be minimized, controversies will be solved, trust principle on the state and land registry will be more concrete. These studies, should not be like correction or revision as it is done today but it must be real renovation. Because, it would not be possible to create the same effect with correction and revision studies.

The juridical regulations must be done regarding the property right and 1007th principle of Civil Code which is under the reassurance of state, for finding solutions on problems related with cadastre based problems which is unders the responsibility of state; and juridical regulations should be done for these problems. Whatever the method is, it will be true to study the problems which can be sourced from cadastre renovation.

a) Technical problems

- Losing facility which are belong to land control points like triangulation and polygon, unable to have application qualification even for the borders which are not changed.
- Incompatibilities between the land and screw plates which happens as a result of measure and drawing mistakes which are done during the cadastre studies and not to have application ability even for static borders.

- Corrosion of the used screw plates, their becoming unusable because of their bad quality, causing rough mistakes if used.
- Inadequacy of screw plates which are produced in graphical system, except for daily needs.
- Incompatibilities between screw plates and lands.
- Inadequacy of some screw plates as they are produced by photoplan method.
- Unability of plan scales to the necessities, and occurrence of rough mistakes in case of zooming out of mistake limit.
- Inadequacy of educated staff and equipment in the times that cadastre started.
- Increasing of plan sensitivity regarding the increasing value of the real estates for the development of the cities and application of construction plan.
- Unable to update the changes after the preparation of cadastre, unable to increase sensitivity of the previous screw plates, unable to transfer these data to computer media.
- Limitation of application ability because of the very narrow frame of 2859 numbered Land registry and Cadastre screw plates law that is promulgated for the solution of technical problems.

b) Socio-Economic Problems

Fast growing of cities because of the immigrations from rural area to cities, urbanisation, construction plan applications and increasing value of real estates based upon this, there has been a need for more sensitive measurements. This necessity which happens in urbanisation, will also be valid for rural areas.

Cadaster renovation process to solve these problems ;

- it must be considered with process of producing big scaled base map series.
- scale, base plate, screw plate classification and standardization in coordinate system and providing coordination
- All users should be enabled to add personal information to the base maps.
- Updating of all information by the producing of maps, the institutions which include in producing process should be able to join this process as much as they spend from their own resources.

In this sense, all studies to be done, will reach their aims as long as there is coordination and cooperation between the managements (Köktürk 1996).

3.3.2 Conceptual Qualification of Renovation

In order to be able to protect the rights on real estates, it is a must to establish and follow these rights on the existing land registry with their existing situations. Property rights on the real estates and responsibilities out of property which occurs on the geometrical changes of their situations, relying upon the wishes of the authorised people, it is done upon the land registry and land register plan.

Cadastral renovation, regarding the definition in the law includes the services of " technically inadequate, losing application ability, and the screws which are observed to not to show the floor on the right position and recreating and rearrangement of the cadastre screw plates in a more sensitive way."

4. SURVEY AND APPLICATION

There has been the attendance of TKGM dependent 48 cadastre management and 37 university lecturer . Below question are asked to attendant;

- a) Do you think that it is necessary to make renovation studies for Turkey's facility cadastre?
- b) If yes, do you think is it possible to get efficient results with existing 2859 numbered Law and regulation?
- c) If your answer is "yes, it is possible" for the 2nd question, what do you think that what is the reason for passive use of the 2859 numbered Law till now?
- d) If your answer is "no it is not possible" for the 2nd question what is the proper solution, and what do you offer ?
- e) What is your possible offer for overcoming the existing problems in cadastre?
- f) Is it possible to use a screw plate, which has lost its currency, oriented with base or technically lost its ability of application, without putting it to renovation studies?
- g) What are the problems in registration based studies in general, how can it be overcome?

4.1 Evaluation of the survey and results

Main subject to be told in the light of survey questions and given answers are like at the below;

- It is an indispensable reality the need for the renovation of the country's cadastre. The deficiency and necessity in this reality evokes itself more and more every day.
- It seems impossible to fullfill this necessity because of the existing aim, content and application poverty. Existing datas are the indicator of this.
- Appliaction of 2981, 3194 and 3083 numbered laws, as an alternative to the renovation studies, can be efficient methods for solution of partial areas. But they can not reconstitute a big organism like cadastre. In this sense, there is need to make regulation for the problems in the application, deficiencies of the regulation about the application, existing cadastre bases being deficiency, old and unsupplying, inadequacy of equipment, etc. and minimise them.

If we put an order for the approved regulations, regarding the survey datas;

- a) In respect to legal regulations;
 - Making regulations in Turkish Civil Code and Cadastre Law, and creating a legal basis should be created named second cadastre or renovation cadastre.
 - No matter whatever the name, a system which is proper for the today's system should be designed for supplying all technical and property rights.
 - In order to prevent the spaces which will be occur during the period until creating this system, there must be legal regulations for the renovation cadastrel change of the screw plates.
 - The legal arrangements must be done for providing coordination and data transfer between the map producer institutes.
- b) In respect to institutive regulations;
 - Information system bases which are provided by instutions must support each other.

- Personal individualisms must be put away, repetitions must be avoided.
- Coordination must be provided for data usage and change between the institutes.
- In house professional orientation must be provided.
- TKGM must be reconstituted regarding the necessities of today.
- Private sector must be used more for service procurement.

c) In respect to regulations about technique and equipment;

- Facility cadastre must be completed urgently.
- Country's geodesic network must be widened, condensations must be done throughout the country and control point problem must be minimised.
- Information technologies base must be widened in every institute, in house education must be concentrated.
- In the institutes, "database which uses national database information system" must be concentrated.
- Dispersion of technological devices like GPS, electronical total station, etc. to the institutes must be done.
- Educated staff employment must be done, "efficient usage of the human sources "in the institutes must be provided
- Professional inadequacy of the existing staff must be compensated by in house educations.

d) In respect to social and economical regulations;

- Lack of fund, which is the biggest obstacle in front of the institution studies, must be overcome by financial regulations.
- Personal benefits of the staff must be enhanced.
- Briefings must be given for creating "continuity in cadastre" in the mind of public; negative effects in social communication should be put away.

4.2 Application

The place which is chosen as "application area" consists of 48 parcels, has a cadastre map which is produced in cartoon base and tacheometric method, free from coordinate and produced by cadastre management in 1952 as a result of a cadastre study in 1500 scale. (Figure 4.1)

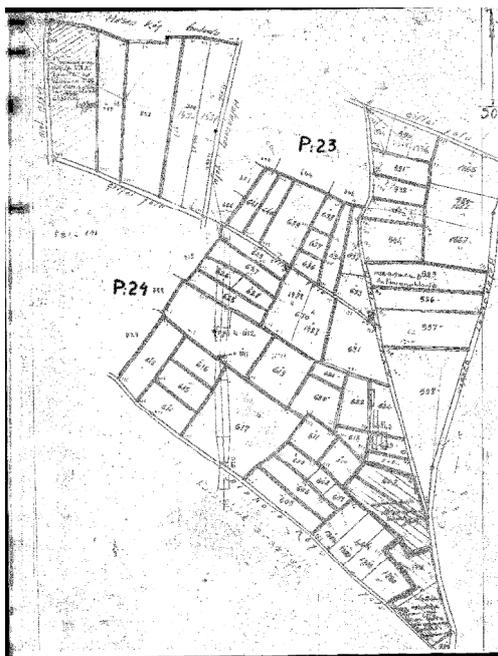


Figure 4.1 Cadastre map which shows the application area

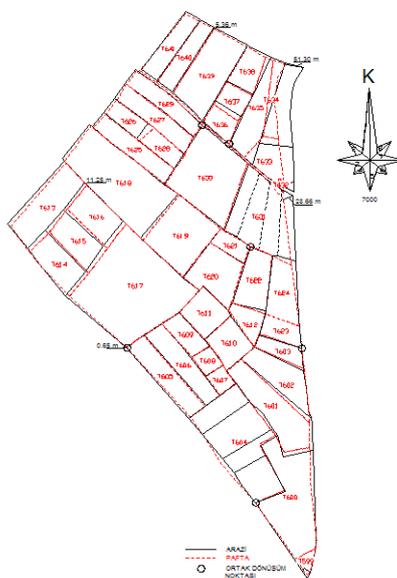


Figure 4.2 Land-numerical map associating.

5. RESULTS AND ADVICES

5.1 Results

Required application results, proved the existence of property problems in study area and shows that existing situation can not be database for information systems. Soexisting cadastre map and real estates that it includes must be urgently renewed. This determination can be accept as a small example of necessity of "renovation of all of the existing graphical map bases." Another discussion point is that ; which method to use in renewing these datas.

For the parcels existing in application area, 1458 numbered circular and 3402 numbered Cadastre Law has done the process of correcting technical mistakes. But, as there is a lot of drawing, measure, square measurement (property problems in some areas, supplying land and map accord partially, around 50% square measure mistakes) has made this method unpracticable. As long as there is not an application or renovation by TKGGM, it will take time to remove these mistakes.

If the existing problems are examined arond the circular for the digitizing of cadastre maps; that the maps having local coordinate system, low sensivity of coordinate transformation because of incompatibilities between land an map, makes this method difficult to apply. According to the regulation, it will cause great problems to accept map value in the out of border. Already, the applicability of the digitizing regulations, can be subject to photogrammetric maps which are produced in rural areas. Their possibility of applicability in graphical and old cadastre maps, which are based upon conversion, is low. This situation is also valid for the application area that we work in, there was seen border parcel drifts in north-east side 1-5 meters.

As the stucy area is out of the contruction plan, put away the possiblity of solving the problem with urban area arrangement. Applicable renovation studies can be done by, revised form of 2859 numbered Renovation Law and Regulation and 3402 numbered Law's 22/a article. When we consider the existing law and regulations, bureaucracy density is a lot, there is a dependance for the first facility datas and it is difficult to analysing the in application processes.

In the exampled application;

- there is deformations related with time and usage.
- country is produced free from coordinate system.
- there is a lot of drawing mistakes on the map.
- In the cadastre measuring surveying rods, length limits are ignored; readings between 400-500 are done extremely.
- measuring points in the establishing cadastre, are done without the base surface, angle-distance method uncontrolled and in meter sensitivity.
- Parcel square measurements, which are calculated by tacheometric values and 48% of the square measurement which are required from transform of planimeter, are out of mistake edge.
- Mapping of the tacheometric drawings with map can not be provided.
- wrong calculation is done because of ignoring square measure distances.
- a healty mapping of the prepared floor base and orjinal tacheometry could not be provided.
- according to the determined common points, value point position mistake in the processed

processes, 1.809 meters.

- there is inconsistency among the registered coordinates of the parcels which has had partial applications.
- There is the problem of imbrication when the parcels are out of any application .And classifications will cause problems in the receiving of the registered coordinates. System transformation datas, which are belong to these applications, will arise screw plate-ground problems.
- It is seen that there is around 89% in the ground usage of the parcels and registered area in the land registry, 57% percent with the tachometry areas mistakes out of limits

5.2 Suggestions

Cadastré is a living fact. Depending upon the time, the datas which constitute it changes. Following this change and updating the system regarding the necessities of day is also mission of cadastre. But in Turkey, Civil Law and existing cadastre law, does not allow property change and second producing of cadastre. As the establishment cadastre is completed, cadastre law which is in charge, will finish its mission. In this situation, there is a need for a new law which will provide consistency. There is need juridical regulations for a constantly changing, improving and renovation of cadastre for oriented today's foresight and a system which is appropriate for this and legal regulations that this system based upon. Providing standard union with this regulation; connecting coordinates to country's geodesic network; increasing value of the contemporary concepts and technological uses; conceptualization in the information systems and dealing about chosen of model content and design; research, education and education areas understanding this unity; it must be aimed to professional respectibility and increasing functionality of cadastre in every scope.

In this context;

- there must a new cadaster law which will be constant, compatible with needs, assesment of all datas according to the parcel based Land Information System.
- Country cadastre must be assessed in the concept of land management; completing the studies about planning of urban and rural land use and solution of environment problem, making the necessary contribution to the economy, healing of social structure, must be connected with a master plan.
- Changing of cadastre regulation is supplied according to the information change, but legal regulations could not be done about renovation caadstre. Legal changes about the charging Renovation Law must be assessed.
- information system studies about property based must be fastened; dynamical maps, which are the data plate of the system, must be prepared for the usage of the system; cadastre regulation, must be reconsidered according to the second cadastre studies.
- Basing of numerical maps for other systems should be supplied, institutional cooperation must be done for the determination of datas related with property.
- Necessary base should be provided for the usage of satellite geodesic in cadastral map producing.
- Passing in to country coordinate system must be fastened, existing and newly produced maps should be provided to take place in a common system.
- Duties of numerical map data producer institutions should be reconstructed.

- University, nongovernmental organizations, private sector and juridical assessments should be done and solutions must be produced for the deficiencies of the existing system.
- a forth dimension, concept of value, must be added to existing three dimensions in cadastre; and it must be provided to serve assesment of real estates.
- Archive and otomation system must be powered for stocking of required information of system and usage of it.

As a result, it is clear that in Turkey the studies for "renovation of the cadastre" is indispensable for land consolidation and serving cadastre datas to the service of public in an updated and true way for being base for any kind development projects.

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BIOGRAPHICAL NOTES

I was born in Konya (Turkey) in 1964.

I was an Geomatic engineering in 1985.

I completed Master in 1989 and completed phd in 1999.

I have been asist. Prof. in Selcuk University.

CONTACTS

Şaban İNAM

Institution Graduate School of Natural and Applied Sciences

Address Selcuk University

City Konya

Country Turkey

Tel. +90 332 223 19 41

Fax + 90 332 241 0635

Email: sinam@selcuk.edu.tr