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GIS-based real estate legislation information system design: The case of İzmir, Foça

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Abstract

Due to the rapidly increasing world population, the management of limited and non-renewable land is an inevitable reality for the whole world. While planning the land management, the management of the real estates (e.g. building, parcel) is another topic that needs to be planned. While the real estates are used by the citizens for purposes such as agricultural production, accommodation and lease, they have been the subject of tax due to the economic value they have for the central and local governments. Therefore, the need to legally evaluate, define and registry real estates has appeared. The main motivation in the current study is to present the legal legislations (e.g. law, regulation) that the real estate is responsible for due to different main criteria (e.g. owner, location, type, intended use, acquisition form, encumbrance) on a single platform. In this context, İzmir/Foça was chosen as the study area. Then, the spatial and attributive features of each real estate were determined. The legislation information that is responsible for these features was introduced in the attribute table together with the router link. In this way, the originality of the study, which distinguishes it from the existing applications, has been revealed. As a result, legislative information that will enable more accurate decisions to be made for each real estate has been presented with a user-friendly interface.

Introduction

Land is a resource that should be used in a planned manner due to the rapid increase in the world population. During this planning, the need to legally evaluate, define and registry the real estate should also be resolved. In this context, a GIS based information system has been designed in which the real estate and the legislation are related. In this information system, building/parcel geometries, and laws in areas such as property, inheritance and tax were used. The main reason for the design of the mentioned information system is the existence of too many legal legislations that will cause legislative inflation and the fact that these legislations are carried out by different institutions. These two situations make difficult for real estate owners and many professional groups (e.g. lawyers, real estate specialists, engineers, planners, appraisers, experts) to understand and follow the legislation. Cases on real estate, the processes of preparing valuation reports, and the decision-making processes of experts will be shortened with the use of the designed information system. In addition, real estate owners will be more aware in protecting and using their legal rights.

Another reason for designing the information system is that the real estate-centered legislation studies in the literature are mainly related to the determination and classification of the legislation. For example, Çete [1] has determined that as of 2008, there were 88 laws, decree laws and bylaws related to land in our country. İşiler [2] has determined the laws concerning the first degree land management. Candaş [3] has examined successful samples (e.g. Germany, Netherlands, Spain) for the real estate valuation together with the legislation forms. İban [4] has modeled legislation for rural areas (e.g. agriculture, pasture and forest lands) in a spatial data infrastructure. Polat and Alkan [5] have revealed that more harmonious and mass legislation arrangements can be made by using the “Co-Concepts and Co-Citation Methods”, which enables the determination of the most related laws with each other. The studies that identify the legislation associated with land management and classify them

in subtitles have been listed in sequence. No study and/or application has been met that shares the legal legislations due to the real estate location, attribute, and property form. In the current study, an information system was designed and presented to eliminate this relative missing part.

Material and Method

The legislation of the real estate is a very important research topic in terms of determining the rights and responsibilities. However, no meaningful information has been presented to the public on this topic. In the current study, the relationship between real estate and legislation was presented in a GIS-based information system. At every stage of this information system the ArcGIS software, which is the product of ESRI company, has been used effectively. The main question that guided the study was "Is it possible to access the legal legislations that the real estate is responsible due to its spatial and attributive feature through a single platform?". In this context, some web-based applications (e.g. parcel inquiry, title deed information inquiry, ATLAS) were examined and the relative user needs were determined in these applications. The examination result is that the mentioned applications don't provide any legal legislation about the real estate. Then, the study area was determined as İzmir, Foça. The study area is a coastal town with a total area of 58.75 km² and a coastline of 25 km. The study area was shared in Figure 1 with the building/parcel geometries and the land cover digitized from 1: 100,000 scale environmental plan.

In the continuation of the study, the main criteria (e.g. owner, location, type, intended use, acquisition form, encumbrance) were determined based on the spatial and attributive features of the real estates. Three of these main criteria consist of imaginary data set (e.g., owner, acquisition form, encumbrance), while three of them consist of an actual data set (e.g. location, type, intended use). The graphical and verbal data of the main criteria consisting of actual data sets were obtained from various data sources (e.g., base maps, web-based applications, closed source public data). The data projected in the same coordinate system were generalized for the intended use and stored in the geodatabase. Then, according to the main criteria, legal legislation associated with the real estate was determined and a comprehensive legislation inventory was created. Subsequently, some analysis processes (e.g., overlay analysis, buffer analysis, digitizing, select by attribute/location) were carried out. In this way, the attribute table of the real estate containing the legislation information was made ready for the user.

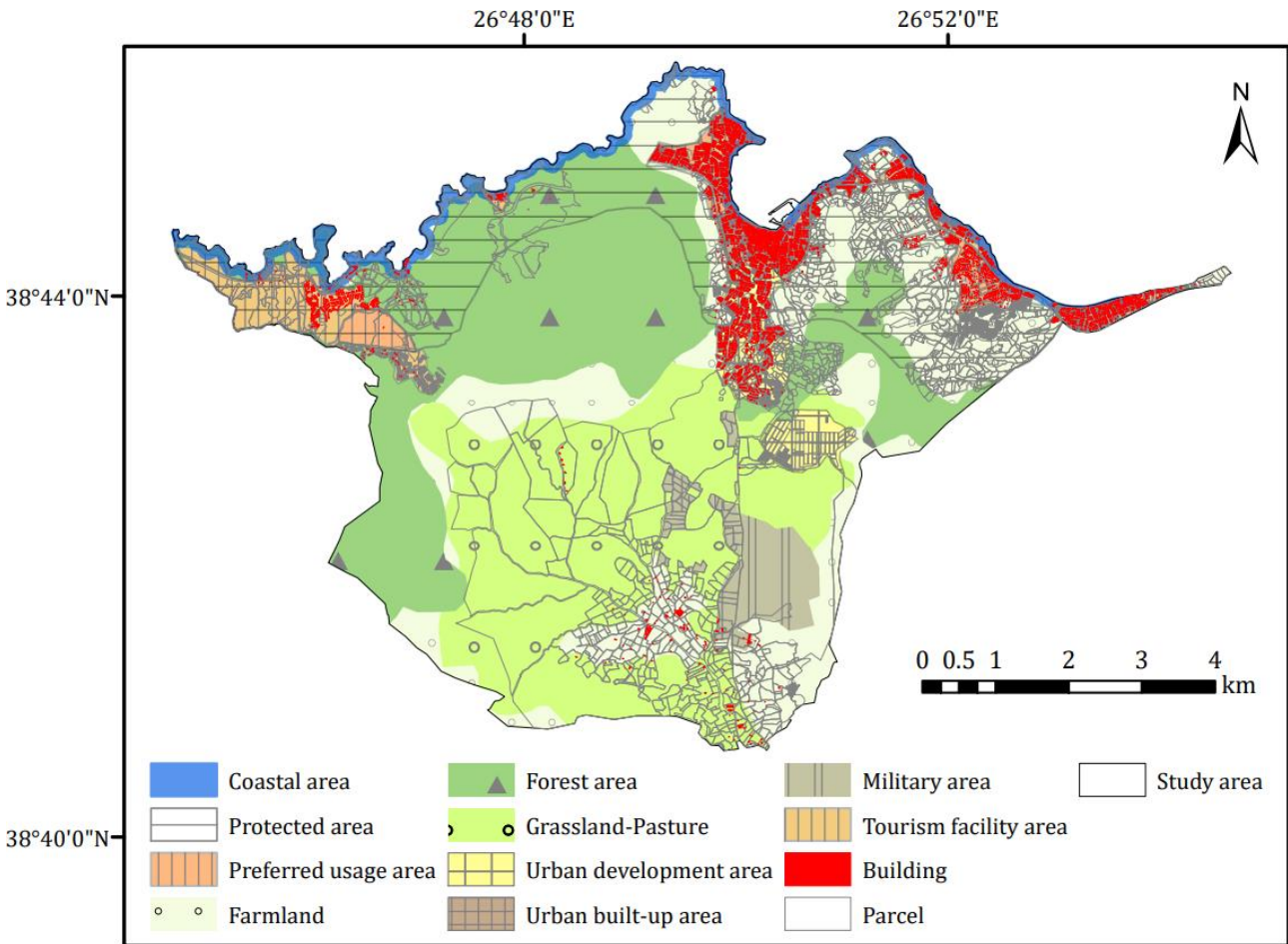


Figure 1. Study area

Results and Discussion

Each real estate in the region of interest has been related with the legislation spatially and attributive. In order to better understand the relationship, sample queries of six main criteria were made on the same real estate. For the real estate located in İzmir province, Foça county, Yenifoça neighborhood, 10729 block, 10 parcel; owner is natural person so “Turkish Civil Code No. 4721 of 2001” and “Expropriation Law No. 2942 of 1983” (Figure 2a); location is urban built-up area so “Zoning Law No. 3194 of 1985” (Figure 2b); type is construction servitude so “Turkish Civil Code No. 4721 of 2001” and “Condominium Law No. 634 of 1965” (Figure 2c); intended use is residence so “Zoning Law No. 3194 of 1985” and “Condominium Law No. 634 of 1965” (Figure 2d); acquisition is purchase and sale so “Turkish Civil Code No. 4721 of 2001” and “Land Registry Law No. 2644 of 1934” (Figure 2e); encumbrance is family housing annotation and management plan and single space number change statement so “Turkish Civil Code No. 4721 of 2001” and “Condominium Law No. 634 of 1965” (Figure 2f) appears in the attribute table with the router link. These inquiries are proof that a real estate may be subject to more than one law at the same time due to the spatial and attributive features.

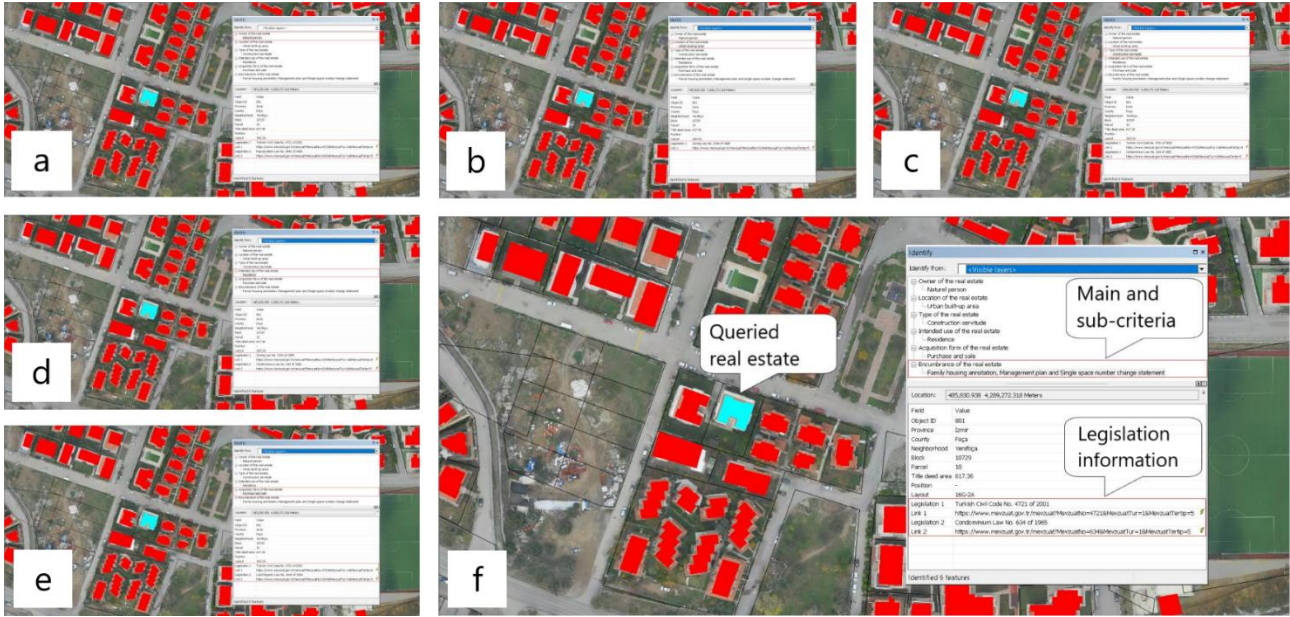


Figure 2. Sample queries of six main criteria

Conclusion

The legislation information of the real estates was presented with the attribute tables. In this way, the real estate owners who do not have technical and legal information and the professional groups interested in the real estate will reach the legal legislation. Thus, the public will use its legal rights more consciously. In addition, decision-making processes in real estate lawsuits, valuation report preparation processes and acquisition procedures will be shortened. In addition, pecuniary loss and intangible damages (e.g. penalties, usage constraints, loss of immovable) will be reduced in the cases, carried out in accordance with the incorrect legislation. Designed information system has also been a guide for possible updates that can be made in some applications (e.g. parcel inquiry, title deed information inquiry, ATLAS). As a result, the mentioned system should be supported by public power and presented to users. In this way, the diversity of the service provided to the public will increase and a more sustainable real estate-legislation management will be established.

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