



## Determination of Zoning Diameter According to Clustering Method in Local Playground Zoning Islands

Selim TAŞKAYA<sup>1\*</sup>

<sup>1</sup>Artvin Çoruh Üniversitesi, Meslek Yüksekokulu, Mimarlık ve Şehir Planlama Bölümü, Artvin, Türkiye

\*Sorumlu yazar: selim\_taskaya@artvin.edu.tr

### Abstract

In our country, activities are carried out under the title of zoning studies in order to make an area suitable for holistic living standards. There is a hierarchy in the formation of zoning plans from the upper scale of the country development plans to the lower scale, which are the implementation zoning plans. Along with this hierarchy, in the 1/1000 zoning plans, especially the people living in a region, housing, shopping, social activity, etc. zoning islands are determined within the zoning boundaries determined to meet the needs. Zoning islands can have different building regulations, precedent or building heights. There are possible building regulations within the zoning boundaries, where there may be different types of sitting areas, such as split, block and adjacent basis. Local Playgrounds are zoning islands or parcels that are created for the purpose of children's social areas, in the form of a discrete building order, with a fixed front draw distance. The process of granting construction permits to the existing zoning parcels in the zoning islands, whose identities are determined by this building regulation, is the zoning scale. Zoning diameters, planned areas are given within the framework of type zoning regulations and plan notes. The zoning diameter is given according to the precedent, height and building order of the island. With the Clustering Method, a subset feature is provided from the outside to the inside depending on the convex shape of the parcel in general. In this way, it is possible to extract the area where the building session can be done with various geometric distance determination process.

**Keywords:** Local Game Zoning Islands, Zoning Diameter, Clustering Method

## Mahalli Oyun Alanı İmar Adalarında Kümeleme Yöntemine Göre İmar Çapı Belirlenmesi

6

### Özet

Ülkemizde bir alanı tümsel yaşam standartlarına uygun hale getirmek için imar çalışmaları başlığında faaliyetlerde bulunulur. Ülke kalkınma planları üst ölçekten, uygulama imar planları olan alt ölçüğe doğru imar planlarının oluşturulmasında bir hiyerarşi vardır. Bu hiyerarşi ile birlikte 1/1000'lik imar planlarında, özellikle bir bölgede yaşayan insanların barınma, alışveriş, sosyal aktivite vb. ihtiyaçlarını karşılamak üzere belirlenen imar sınırları içerisinde imar adaları tayin edilir. İmar adaları farklı yapı nizamları, emsal ya da bina yüksekliklerinde olabilirler. İmar sınırları içerisinde ayrıık, blok ve bitişik esas olmak üzere farklı tipte oturma alanlarının olabileceği muhtemel yapı nizamları mevcuttur. Mahalli Oyun Alanları, ayrıık yapı nizamı formatında ön çekme mesafesi sabit şekilde çocuk sosyal alanları amaçlı oluşturulan imar adaları ya da parselleridir. Bu yapı nizamı ile kimlikleri belirlenen imar adalarındaki mevcut imar parsellerine inşaat izni verilebilmesi işlemi ise imar çapıdır. İmar çapları, planlı alanlar tip imar yönetmeliği ve plan notları çerçevesince verilir. Adanın emsal, yükseklik, yapı nizamına göre imar çapı verilme işlemi yapılır. Kümeleme Yöntemi ile genel olarak parselin konveks şekline bağlı dıştan içe doğru bir alt küme özelliği sağlanır. Bu şekilde çeşitli geometrik uzaklık belirleme işlemi ile bina oturumunun yapılabileceği alan çıkarımı sağlanır

**Anahtar Kelimeler:** Mahalli Oyun İmar Adaları, İmar Çapı, Kümeleme Yöntemi

## 1. Introduction

The fact that those whose interests are most affected during the preparation and implementation of zoning plans are favored by the plan-making bodies and actors reveals two major topics. First, is the liberal plan and the decisiveness of the capital, or is it a planning approach that adopts a protectionist policy aiming at the welfare and peace of the broad masses? On the other hand, is it a socialist planning activity in which every power and authority is determined from a single source and therefore carried out by a branch of the central authority? This preference is the factors that will affect the planning preparations and applications. The second is urban clientalism. Supporting the transfer of the rent obtained from zoning and planning practices to certain individuals or groups through abuses is the most obvious obstacle to the use of the generated income in favor of the society. Urban clientalism, as a much studied concept in the context of zoning plans, makes its weight felt in the scientific field. Today, zoning plans, in other words, planning related to zoning, make their weight felt even more as a result of urbanization and increasing migration from rural to urban areas. The increasing population and the desire for quality life disrupt the absorbable dynamics of cities by forcing them, and as a result of this process, the authorities who are in charge of planning are pushing to find new methods and take the lead (Namlı, 2017).

In addition to population growth and migration, industrialization, concentration of economic activity area in big city centers, education quality, etc. reasons lead to agglomeration in cities. Infrastructure and superstructure facilities, transportation investments, activities in the fields of health, education, culture and tourism always constitute the main subject of planning (Başöz & Çakmakçı, 2014). In addition, the protection of the environment, image and natural resources, which are increasingly important today, and the prevention of interference with the naturalness of the vegetation is another aspect of the planning phenomenon. So much so that in order to create housing and other social facilities, which are the most basic needs of civilized people, there is a need for a regular urbanization with livable spaces and new lands to be produced in a planned manner (Koçak & Beyaz, 2015).

Implementation zoning plans are in Art.5/2 of the Zoning Law; It is defined as “the plan that is drawn according to the master zoning plan principles with the cadastral status, if any, processed on the certified current maps and that shows in detail the building blocks of various regions, their density and arrangement, the roads and the implementation stages and other information that will be the basis for the zoning implementation programs required for implementation” ( Namlı, 2017). In our country, within the framework of urban plans, 1/100,000 environmental plan and 5000 or 2000 master development plans of areas open to development in cities are transformed into 1000 application plans through local governments, and zoning and urban planning activities are carried out in the light of laws and regulations. It is aimed to be implemented in line with the principles of compliance (Taşkaya, 2019a). Rapid urbanization has brought about unplanned development. This process has revealed an urban texture where social and technical equipment areas are insufficient, transportation planning cannot be made, and industrial facilities are intertwined with living and resting areas (Taşkaya, 2019b).

## 2. Material and Method

For the clustering process, many clustering methods have been developed by researchers until today. Generally, clustering methods are grouped under two categories as segmented and hierarchical. Convergence and Fuzzy C-mean methods, which are divisional methods, are frequently used for clustering operations. In addition to these standard clustering methods, clustering methods based on optimization methods have been developed recently. Clustering has been applied to many fields such as bioinformatics, genetics, image processing, speech recognition, market research, document classification and weather classification. In addition, clustering has also been applied to document data analysis, which is one of big data learning. (Anwer, 2021). Classification can be generally defined as "estimating the most probable case of a categorical variable (class) given the values of other variables". For a given set of variables in the database, the boundaries between classes are represented by measures (Tadesse et al., 2009).

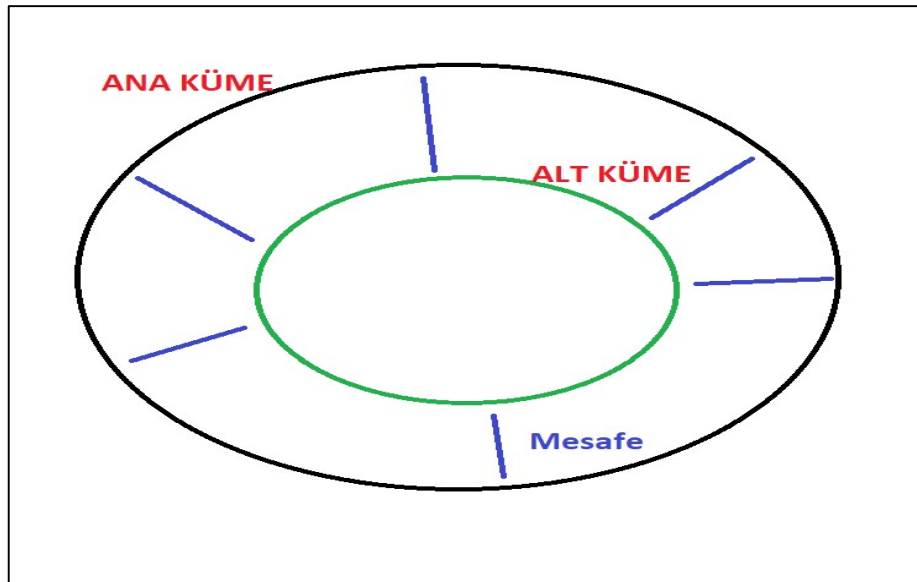


Figure 1. Clustering main logic representation (Anonymous, 2022).

In Figure 1, if the logic is taken as a cluster from the outside to the inside, the main purpose of our study is to apply the draw

distances according to the precedent and the island plan note and feature, no matter what geometric distance finding process is done on the basis of our study.

Cluster analysis is a method that investigates the cluster structures and numbers of data that appear in different structures. Cluster analysis groups are not exactly known; It is one of the multivariate statistical analysis methods that helps to separate units and variables into similar subsets or groups (Malkoç, 2018). The most obvious purpose of cluster analysis is to classify units according to their characteristics (Tatlıdıl, 2002).

### 3.Findings

In order for citizens or official institutions to build on a land, they have to get permission from the municipalities within the boundaries of the municipality's zoning and adjacent area, and from the special provincial administrations outside the boundaries of the municipality's zoning and adjacent areas (İmar Law, 1985; Taşkaya, 2019). If it is a cadastral parcel, the relevant immovable, that is, if the application of Article 18 and the consolidation of the parcel, its abandonment to the road or its creation from the road have not been made, the construction permit cannot be granted in its current form (İmar Law, 1985). If the parcel is in the shape of the land within the normal zoning limits, and if it is outside the zoning boundaries, it is allowed for construction if it has a frontage to at least one road, without leaving the road or without creation (İmar Law, 1985; Taşkaya, 2019). Regardless of the type of construction, residential, commercial, industrial, residential + trade or vineyard areas outside the zoning boundaries, or whatever will be done outside the zoning contiguous borders, the first step of the process is the zoning diameter. Zoning diameter is the process of giving the drawing distances in accordance with the building regulation, in the national coordinate or local coordinate system, within the framework of the planned type or unplanned type areas regulation. After the zoning diameter is given to a plot, the project phase is started. It is the basic initial zoning diameter for construction in a place (Taskaya, 2019a).

In the planned type zoning regulation, which entered into force in October 2017, articles were given about garden distances in particular. It is clearly stated that the rear towing distance should be at least 3 meters, especially in the zoning blocks in the adjacent layout style. Based on this, the rear towing distance should be at least 3 meters in adjacent zoning blocks, and it should be pulled by increasing 0.5 meters per floor after 4 floors, such as in the side garden. However, as long as the plan notes are not contrary to the zoning regulations applied in planned places, studies specific to that region can be carried out with the decision to be taken by the council of the municipalities, which is the relevant institution. In adjacent parcels, the intersection areas of the rear drawbars, which are called lighting, can also be calculated in this way. Before 2017, in the planned type zoning regulation, an application was made at the rear draw distance, based on the parcel depth, the building height, which is called the building depth, which is called L in relation to the rear draw distance. The aim was to remove the whole of the parcel from concrete and leave an area for the population to relax on a parcel basis. Since the TAKS (Base Area Coefficient) event was not taken into account in adjacent layouts, this L was applied as the rear haul distance, together with ensuring the minimum parcel depth and parcel width. If these conditions are not met, at least 3 meters of traction is given and the parcel is given a rear pulling distance. In our study, especially in a local-based region, based on the plan note to be taken from the municipal council, the rear pull distance is taken as half of the height and the zoning diameter is shown.

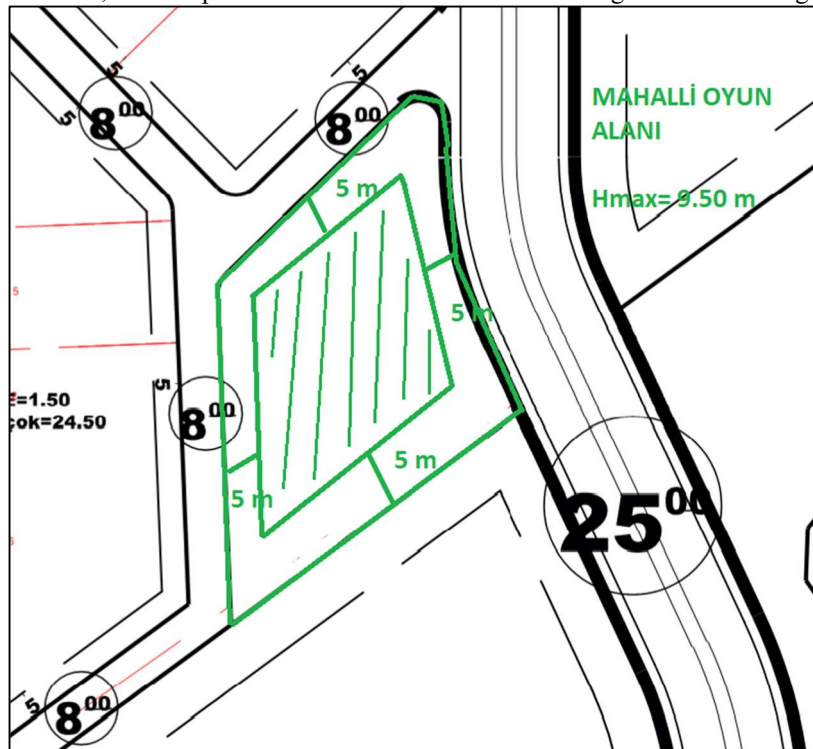


Figure 2. Zoning diameter view

In Figure 2., the relevant immovable is included in the zoning plan as a local playground. It is understood that playgrounds up to a maximum height of 9.50 meters can be built. Since there is only one zoning island and parcel according to the distance approach, the zoning diameter is shown by drawing the pre-drawing distance of 5 meters.

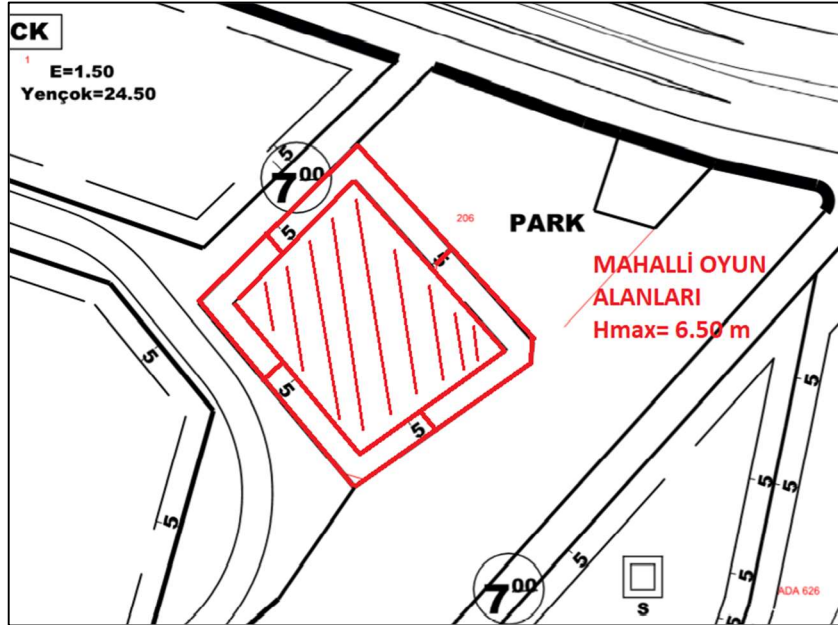


Figure 3. Zoning diameter view

In Figure 3, the zoning diameter is given by drawing 5 meters from one side of the immovable 4, which is in the form of a single zoning island and parcel. It is understood that game facilities can be built with a maximum height of 6.50 meters. Since there is a parking area next to it, the parks are seen as roads according to the planned type zoning regulation, 5 meters from each of the facades facing the park.

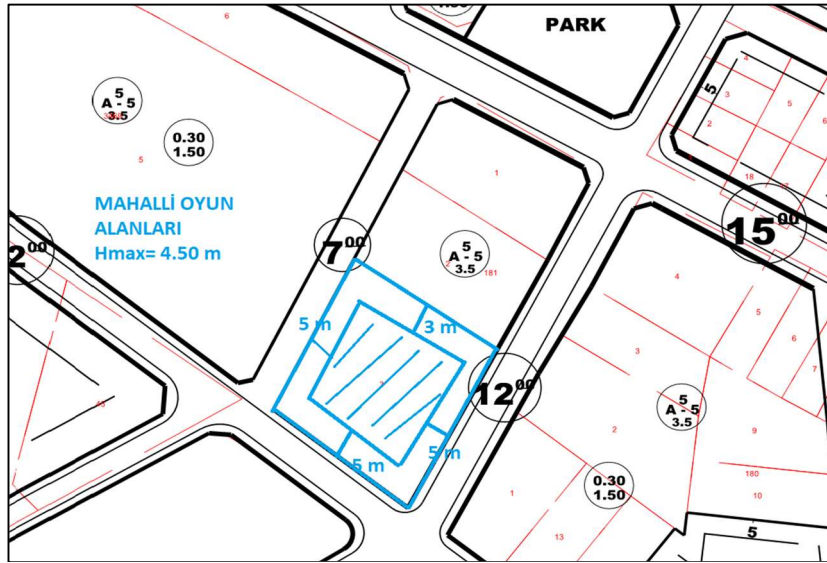


Figure 4. Zoning diameter view

In Figure 4., the immovable is located in a 5-storey zoning island and is processed only as a local playground on a parcel basis. Since it is a point where the population of the population is high, it has been acted in this way. Since the front drawing distance is 5 meters and the side garden distance is up to 12.50 meters in this parcel, where the maximum allowed length is 4.50 meters and the total number of floor areas is 0.30, the zoning diameter has been given by drawing 3 meters.

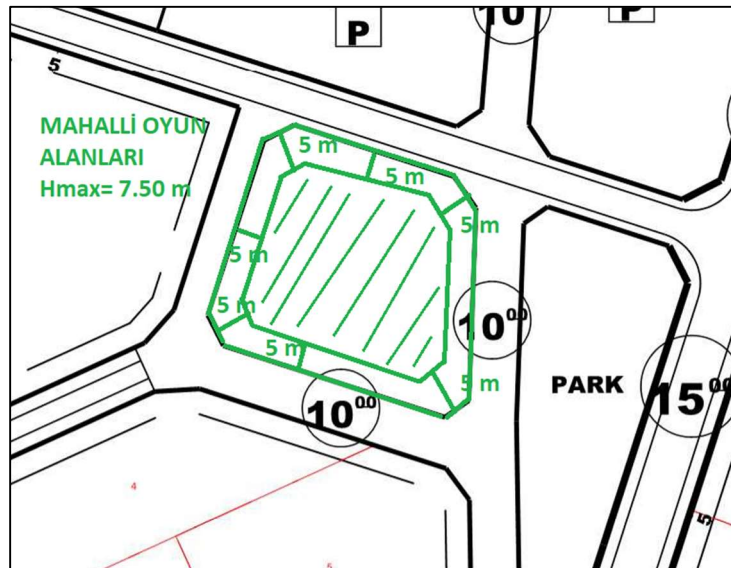


Figure 5. Zoning diameter view

In Figure 5., since the relevant immovable has only one zoning island and parcel, all four sides are evaluated as roads and the zoning diameter is given by drawing the distance from the front garden to 5 meters. The maximum height is recorded as 7.50 meters.

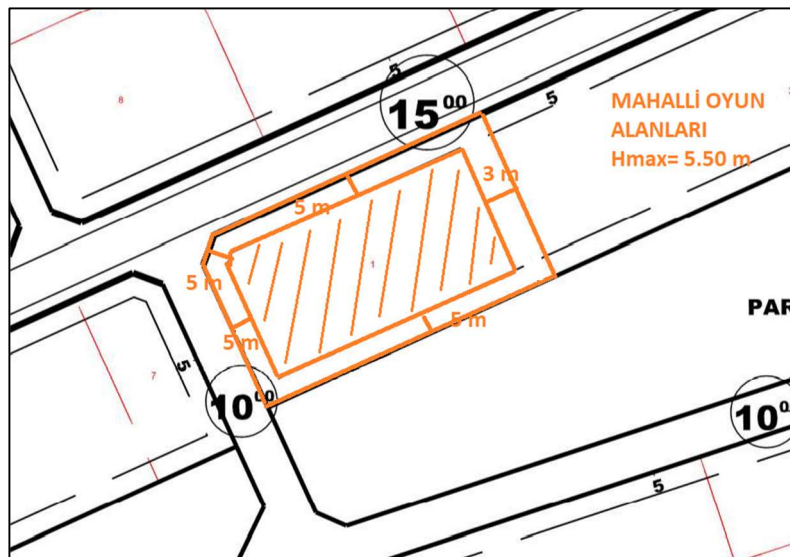


Figure 6. Zoning diameter view

In Figure 6, the immovable is the local playground. Playground areas can be established with a height of up to 5.50 meters. The zoning diameter, on the other hand, has been increased by 5 meters for the front garden distance and 3 meters for the side garden distance to 12.50 meters due to the 3 meters withdrawal rule.

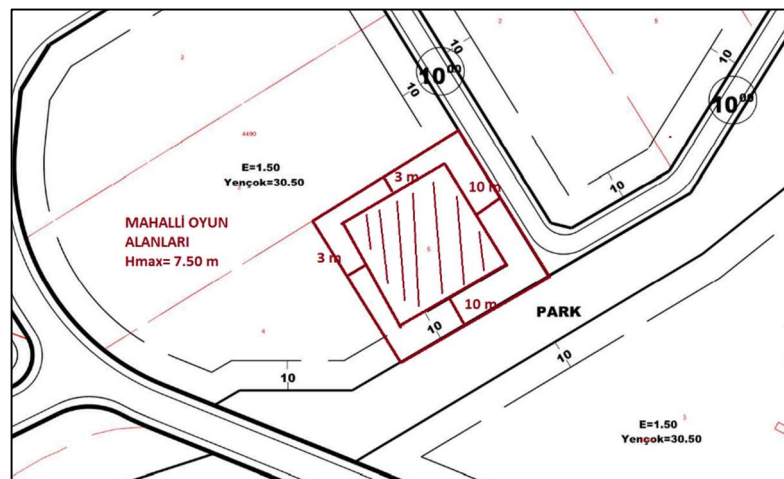


Figure 7. Zoning diameter view

In Figure 7., the immovable located in the south of the zoning island has been processed as a local playground on a single plot basis to meet the needs of a large island where the construction of a 10-storey building is allowed. Since the front towing distance of the island is 10 meters, the distance to the front garden is 10 meters and the distance to the side garden is 3 meters, since the height is 7.50 meters, and the zoning diameter is given in the middle.

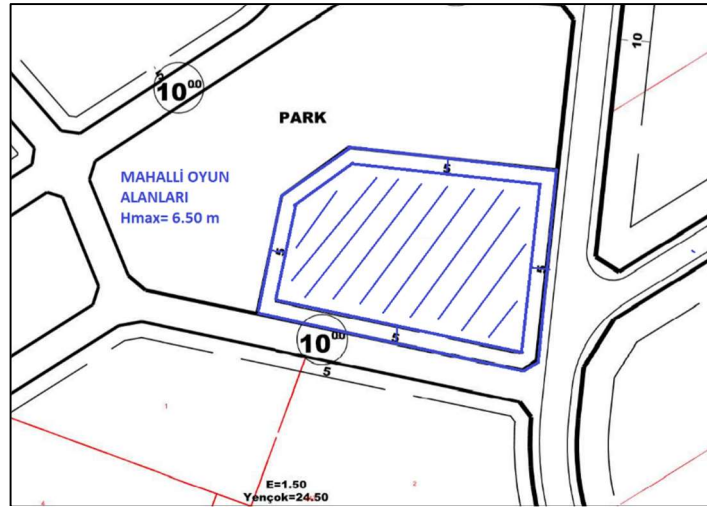


Figure 8. Zoning diameter view

In Figure 8., the relevant immovable is included in the plan as a local playground, again on a parcel basis, within a zoning island. Likewise, the distance to the front garden is 5 meters, and since the side gardens face the park, the zoning diameter is given in the middle by processing 5 meters as the front. The maximum height is recorded as 6.50 meters.

#### 4. Conclusion and Recommendation

The development plans are put into effect in places where there are municipalities such as provinces, districts, towns, according to their scales in the form of master and implementation, and the right understanding of urbanism is tried to be revealed. In these zoning plan legends, zoning islands such as housing, residential trade, trade, socio-cultural, sports facility, DOP areas are created so that cadastral parcels can be converted into zoning parcels by properly dumping them into these islands, and they can get a license for construction. On the islands in the adjacent building order, the area should be opened from the inside out and the building sessions should be appropriate by giving the distance approximations of these parcels with nested clustering. For this reason, zoning islands are created in adjacent areas in regional centers, and in distinct structures such as blocks and separate layouts in places to be opened for new settlements. In these islands, it is explained how the zoning diameters should be given according to the planned type zoning regulation and the plan notes approved by the councils of the municipalities. In the examples in the study, the appropriate zoning diameter has been shown by showing how the zoning parcels should be given in general in different adjacent building regulations.

## References

- Anonymous (2022). Mathematics Lecture Notes.
- Anwer, K.İ., (2021). Artificial Algae Algorithm Based Clustering Method, Selcuk University, Institute of Science and Technology, Department of Information Technologies, Master Thesis.
- Başöz Lütfü;Çakmakçı, R., (2014). Zoning Laws Legislation Legal Publishing, page 7, Istanbul.
- Zoning Law, (1985). Official Gazette Date: 09.05.1985, Number: 18749, Edit.5, Volume: 24, Page: 378.
- Koçak, H.; Beyaz, M., (2015). Zoning Practices Pursuant to Article 18 of Law No. 3194, page 17, Ankara.
- Malkoç, H., (2018). Using Artificial Neural Networks as Cluster Validity Index in Cluster Analysis, Cumhuriyet University, Institute of Social Sciences, Department of Econometrics, Master's Thesis.
- Namli, B.S., (2017). Preparation and Implementation of Zoning Plans, Başkent University, Institute of Social Sciences, Department of Law, Public Law Program, Master's Thesis.
- Planned Type Zoning Regulation, (2017). Official Gazette Date: 03.07.2017, Number: 30113.
- Plan Note, (2018). Plan Note of the Implementation Development Plan, Elazig Municipality, Elazig.
- Tadesse, T., Wardlow, B., and Hayes, M. J. (2009). The application of data mining for drought monitoring and prediction. In Data mining applications for empowering knowledge societies (pp. 278-289): IGI Global.
- Tatlidil, H., (2002). Applied Multivariate Statistical Analysis. Ziraat Printing House: Ankara.
- Taşkaya, S., (2019a). A Research on Reconstruction and Urbanization Activities in Local Governments, Municipality Between 2014-2019, The Case of Elazig Province. International Journal of Eastern Anatolia Science, Engineering and Design, 1(1), 14-28.
- Taşkaya, S., (2019b). A Research on Zoning Diameters, which are the Basic Points for Construction Permits, International Journal of Eastern Anatolia Science, Engineering and Design, 1(2), 142-153.
- Taşkaya, S., Taşkaya, S., (2019). Measurement of Multi-Storey Buildings Using Workbench Module in ANSYS Package Software and Investigation of Prototype Analysis, International Journal of Engineering, Design and Technology 1(2): 51-63.
- Taşkaya, S., Taşkaya, S., (2019). Dimensioning of Coordinate Points of Two-Storey Building in Ansys Workbench Software and Investigation of Stress in Beams, International Journal on Mathematics, Engineering and Natural Sciences, 2019, vol:9 page:40-57.