

International Journal of Engineering and Geosciences

https://dergipark.org.tr/en/pub/ijeg e-ISSN 2548-0960



Optimization of expropriation costs on the highway projects in Türkiye

Kemal Çelik *100

¹ Gümüşhane University, Department of Geomatics Engineering, Türkiye, gumuscelik@hotmail.com

Cite this study:

Çelik, K. (2024). Optimization of expropriation costs on the highway projects in Türkiye. International Journal of Engineering and Geosciences, 9(1), 25-33

https://doi.org/10.26833/ijeg.1255727

Keywords

Highway Expropriation Real Estate

Research Article

Received: 08.03.2023 Revised: 22.10.2023 Accepted: 20.11.2023 Published: 02.01.2024



Abstract

Expropriation is widely used to introduce highway projects into the society. Expropriation is the registration process of real estate and equities owned by natural and legal persons on behalf of the administration for public interest, provided that property and easement right amount shall be paid in cash or in advance or by equal installments. In what situations and by which institutions expropriation is carried out are restricted by the law. In accordance with the Article 3 of the Expropriation Law Number 2942 amended by the Law Number 4650, the expropriation process shall not be started without an adequate allowance provided by the administration. The exercise of the right of property shall not be against public interest." Project areas are required to be converted into public property after the development plans for the public projects are prepared. Areas regarded as private property but intersected by highway, railway or waterway routes can only be occupied after expropriation. Without expropriation, projects based on transportation in improvement areas can be opened to public with the application of the provisions of the Development Law Number 3194, while those in areas having no development plan can be opened to public with the application of the relevant provisions of the Agricultural Reform Law Number 3083 on Land Consolidation in Irrigated Areas and Law Number 5403 on Soil Conservation and Land Use. In this article, opening highways, railways, and waterways to public in Türkiye using the implementation of development plans is discussed. For the real estate coinciding with the route of public investments, if land and land lots are arranged in accordance with the Article 18 of the Development Law Number 3194, state withholding up to 45% may be imposed. The objective function in the state withholding can be stated as f= costmin= f(a,b). Land acquisition increases as the ratio of state withholding increases, resulting in the minimization of the expropriation costs. Public projects such as highway can be opened to public free of charge with development plan implementation in improvement areas and with land consolidation in rural areas having no development plan.

1. Introduction

According to the amendment made with the Law Number 4709 to the 1982 Constitution Act of Türkiye, "government officials and public legal entities are entitled to expropriate proprietary real estate in whole or in part and constitute administrative easements for public interest as per legal rules and procedures, provided that the actual equivalents are paid in advance". The Law Number 2942 amended by the Law Number 4650 governs transactions to be carried out by government officials and public legal entities to expropriate real estate belonging to real and private legal entities for public interest, calculation of expropriation amount, registration of immovable and easement right

on behalf of the administration, revoking unused immovable, procedures related to the transfer of real estate among administrations, mutual rights and obligations, and resolution procedures and methods of relevant conflicts [1-4].

In any neighborhood, an immovable, its outbuilding and constitution of easement for the immovable may be a subject for expropriation. For expropriation, the authority or the person authorized to initiate the expropriation process should acquire the decision of public utilities. Public institutions and organizations are able to make expropriation on subjects restricted by law. A service that is among the fundamental duties of public institutions can be transferred to another administration to the extent permitted by law [5-6]. In this case, public

interest regarding the expropriation for the realization of the service transferred shall be obtained by the competent authority of the administration that the service is transferred to. Authorities granting the decision of expropriation are entitled to revoke the decision of expropriation as per the principle of formal parallelism. Another administrative authority that is not the one granting the decision of expropriation shall not revoke such decision. In Türkiye, authorities who are entitled to grant and certify the decision of expropriation are explicitly listed under the Articles 5 and 6 of the Expropriation Law Number 2942, respectively. Except for the listed authorities, there are certain institutions granted the duty and authorization of expropriation. Relevant authorities are entitled to make expropriation as per the Law Number 6200 on the Organization and Functions of the General Directorate of State Hydraulic Works (Article 3), the Law Number 6001 on the Services of the General Directorate of Highways (Article 22), the Law Number 3096 on Granting Authorization to Institutions Other Than the Turkish Electricity Authority For the Generation, Transmission, Distribution and Trade of Electricity (Article 11), the Law Number 3154 on the Organization and Duties of the Ministry for Energy and Natural Resources (Article 11/c), the Turkish Mining Law Number 3213 (Article 43), the Free Trade Zones Law Number 3218 (Article 5), the Organized Industrial Zones Law Number 4562 (Article 4), the Natural Gas Market Law Number 4646 (Article 12/a), the Technology Development Zones Law Number 4691 (Article 5), the Petroleum Law Number 6326 (Article 87/1), the Law Number 4753 on Protection Against Flood Waters and Floods (Article 11), the Free Trade Zones Law Number 3218 (Article 2), the Law Number 933 on the Implementation Fundamentals of the Development Plan (Article 2/C), the Law Number 2565 on Military Forbidden Zones and Military Security Zones (Article 7/1), the Law Number 6461 on Liberalization of Railway Transportation in Türkiye (Article 5), the Law Number 6704 on Amending Certain Laws and Decree Laws (Article 8), the Agricultural Reform Law Number 3038 on Land Arrangement in Irrigation Areas. Although

certain authorities are entitled to make expropriation by law, it is often stated in relevant legal regulations that appraisal procedures for the real estate to be expropriated shall be realized as per the provision of the Law Number 2942 [7-13].

Since highways is large public projects, the expropriation of the property needed by a relevant institution costs a lot. Acquisition of land by expropriation is widely used in Türkiye. Although the principle of payment in advance is based on the actual value as per the 1924 Constitution, expropriation is implemented based on tax value using certain laws in some cases. In accordance with the Law Number 2942 amended by the Law Number 4650 in force, expropriation is ensured to be realized based on fair value [14-19].

2. Method

2.1. Optimization of the costs of highway expropriation projects

Türkiye's surface area is 814,578 km² and the projection area is 780,580 km². The difference between the projection area and the actual area is due to the widespread mountainous areas in Türkiye. Of the total surface area of Türkiye, 98.3% is land and 1.3% is water surface (DPT, 2006). According to the summary of agricultural statistics published by the Turkish Statistical Institute (TUIK) in 2009, of the total land size, 35.1% is used as forestland, 27.3% as arable area, 24.2% as meadow and pasture area, 7.1% as fallow land, 4.9% as fruit garden, olive garden and vineyard, and 1.4% as vegetable garden. In Türkiye, the General Directorate of Highways is the investor institution that needs the highest amount of land.

The total expenditure and expropriation amount of the General Directorate of Highways increase each year in proportion. No data is obtained from other institutions with regards to expropriation. Expropriation and total expenditure of the General Directorate of Highways are shown in Figure 1.

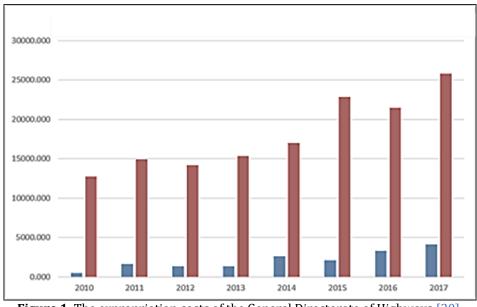


Figure 1. The expropriation costs of the General Directorate of Highways [20].

The expropriation burden of the General Directorate of Highways increases each year. In 2017, the cost of such burden was 4.122.011.000 Turkish Liras. This burden can be opened to the public with development plan implementation and land consolidation, which are among the methods of transfer of land to the public. For the real estate intersected by the routes of public investments, if land and land lots are arranged in accordance with the Article 18 of the Development Law Number 3194, the total area of the cadastral parcel intersected by the implementation area will be [CPA]= 43611.82 m². If the total area of the building blocks in the land arrangement area is [BBA]=26167.09 m², the area reserved for the public will be [ARP]= 17444.73 m². When the Development Readjustment Share (DRP) is calculated for the selected area, DRP is found to be 45% (DRP=[ARP]/[BBA] = 45%). Hence, the expropriated area is maximized and the cost of expropriation is minimized. The related institution bears the costs during the implementation. In a selected readjustment area, there may be areas that are reserved for public services such as roads, squares, parks, public car parks, and green

fields, areas that are not subjected to registration, and areas that are reserved for mosques, police stations, primary and secondary schools under the Ministry of National Education and related facilities. Lands on a route where large public projects are to be carried out can be opened to the public free of charge with development plan implementation in improvement areas other than motorways and with land consolidation in rural areas with no development plan. Withholding up to 10% may be imposed for land consolidation areas. In these areas, it is necessary to make amendments to legislations on land consolidation for opening areas as part of highway projects. In Germany, motorway companies purchase lands in different areas and turn them into land route by implementing land consolidation. It will be possible to transfer areas belonging to the State Treasury in land consolidation areas to the areas planned as a road. As seen in Figure 2, the areas behind the land arrangement are expropriated with minimum cost, i.e. the cost only comprise the cost of the implementation [3, 8, 15-19].



Figure 2. Parcel plan on the highway route (red line).

2.2. Public interest in the expropriation process

Expropriation should be made for public interest. The concept of public interest is addressed under a separate title in the 1982 Constitution Act of Türkiye. The purpose of expropriation shall be for the public interest as per the Constitutional Court Decisions. According to the principle highlighting "public interest" as a basic factor, expropriation is defined as "revoking the right of property on an immovable by the administration for

public interest, provided that its equivalent is paid". As per another definition, expropriation is the dispossess of an immovable for public interest regardless of the owner's consent, provided that its appraised equivalent is paid. In other words, expropriation is a restriction imposed on the right of private property or abolishing the authorities entitled to the state and the right of private property to protect the public interest and provide public services. However; such authority may be used by the state for the interest of state institutions and

organizations or of private enterprises separately within the framework of conditions and procedures determined by law undoubtedly (decision dated 22.09.1993 (Basis No. 1993/8, Decree No. 1993/31)).

The first paragraph of the Article 46 of the Constitution Act of Türkiye states that government officials and public legal entities are entitled to make expropriation for public interest if applicable. Therefore, the purpose of expropriation is based on the concept of "public interest" [14]. In other words, the administration may only make expropriation for public interest. Unless required for the public interest, it shall be illegal for the administration to carry out an expropriation procedure in terms of its purpose [14].

The decision-making authority that decides where and what the public interest belongs to is the "legislative organ". In case of conflict, authority to decide "what the public interest is" by interpreting principles and rules belongs to the "judicial organ". Today, administrations are entitled to make expropriation only "for the public

interest" without any additional condition in accordance with the Article 1 of the Expropriation Law Number 2942 and Article 46 of the Constitution Act of Türkiye. Thus, it can be concluded that the concept of public interest is broadened. It can be said that the Article 3 of the Expropriation Law includes provisions suitable to define the concept of public interest and set its framework. According to this article, public interest as the prerequisite for expropriation shall be a benefit to be obtained by establishing and maintaining public services and enterprises since administrations are able to expropriate real estate required to maintain public services or enterprises that they are legally obliged to provide [20]. Expropriation is not always required for projects for the public interest. Figure 3 shows Google Earth image of the route opened to the public by Trabzon Municipality and the General Directorate of Highways with development plan implementation by signing a protocol and paying implementation expenses only.



Figure 3. Highway route of Çimenli Mahallesi, Ortahisar, Trabzon (Türkiye).

Development plans and projects approved by the relevant ministry are among the documentations that serves to public interest. Plans are listed in the Article 6 of the Development Law Number 3194. These plans start with Spatial Strategic Planning and end with implementation development plans. Spatial planning consists of "Environmental Plans" and "Development Plans" in terms of its purpose and scope in accordance with the Spatial Strategic Planning. Development plans are prepared as a master development plan and an implementation development plan. Each plan is prepared in conformity with the plan of the next stage. In spatial strategic planning, objectives put forth in the development plan and if any, regional planning, regional development strategies, and other strategic are documentation taken into consideration. Implementation of the city development plans upon

acceptance or approval, and land and land lot owners' power to use and benefit are restricted by the public interest. The Article 6 of the Expropriation Law brings a special arrangement for expropriation implementations to be made as per development plans. Accordingly, it is not necessary to obtain the decision of public interest for services to be provided as per the approved development plan or special plan and project approved by relevant ministries. In such cases, the competent authority makes a decision to prove the expropriation process is commenced. Development plans are for public interest in expropriations to be made by municipalities for the development plan implementation and those to be made for public services to be established and operated by municipalities and other public legal entities. Commitment to development plan is essential to expropriation based on a development plan [21-22]. In

accordance with the Expropriation Law Number 2942, plans and projects approved by ministries are for the public interest by decision. As it is known that when it comes to certain investments of the State and certain state institutions and organizations that are economically and socially significant at the country level, investment decisions are made in accordance with the special plan and projects approved by the relevant ministry. For example, as is in the case of building a dam and irrigation, highway, railway or port.

2.3. Expropriation appraisal and the right of property

Appraisal of real estate; the criteria to be taken into consideration for the expropriation appraisal is listed in the Expropriation Law Number 2942 and Article 11 of the Law on Amending the Expropriation Law. In paragraph (f) under the same article, an appraisal is foreseen to be realized based on the "net income brought by the land, immovable or equity depending on its status and condition on the date of expropriation and in case it is used as is". Since the subject is broad, it is deemed suitable to make a short evaluation here.

Appraisal of lands: land is a building land whose substructure is set up for planning and that is invested with the development right for the superstructure. In accordance with the Real Estate Tax Law Number 1319, land lots that are parceled by the municipality within the municipal boundaries are regarded as land. For land lots that are not parceled regardless whether it is within the municipal boundaries, which ones to be regarded as land is determined by the decision of the Council of Ministers. According to the Decision Number 83/6122 on the Lands That Are Not Parceled to Be Regarded as a Land; lands and land pieces;

- a) that are located in the areas assigned as a residential area with development plan within municipal and urban area boundaries.
- b) that are not located in the area assigned as a residential area with such development plan but are within municipal and urban area boundaries, occupied,

- utilizing municipal services and not parceled, are regarded as a land. However, lands and land pieces in such areas are not regarded as a land if used for agricultural activity.
- c) that are parceled by any means for establishing a residential building or a touristic or industrial facility and affixed hereby as an addendum to the title deed but are not within municipal and urban area boundaries,
- d) that are located in the areas assigned as a residential area with development plan within the boundaries determined by the decision of the Council of Ministers due to its location near or around the sea, rivers, lakes and transportation, or its industrial or touristic significance or because of fast urbanization activities, and upon the proposal by the Ministry of Development and Housing but are not within municipal and urban area boundaries, are regarded as a land.

According to this decision, lands and land pieces in such areas are basically declared as per their current value. In accordance with the Expropriation Law Number 4650, an immovable can only be regarded as a land if it is in the development plan on the date of expropriation. If it is within the municipal and urban area boundaries but not in the development plan, it shall be utilizing all public services and its surroundings shall be residential [17]. Appraisal of land can often be determined by direct comparison with similar lands whose real sales values are known. For such appraisal, real values of precedent lands that are similar in miscellaneous qualities shall be known and average purchase and sale value shall be calculated based on precedent values. During such comparison, all quality elements affecting the value shall be taken into consideration such as location and type of land, the physical structure of soil and the road it is located on, road and street widths, and restrictive arrangements imposed under the development plan. It is often difficult to find a precedent immovable for the appraisal of an immovable on the route to be expropriated. Sometimes, this becomes a case taken to the European Court of Human Rights (ECHR). Annual distribution of right of property infringement cases taken to the ECHR by years is as follows (Figure 4).

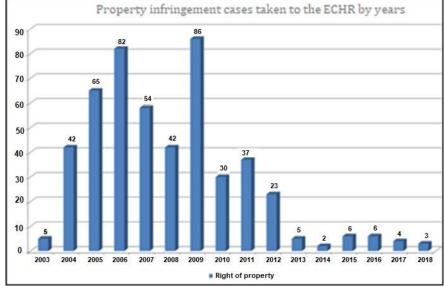


Figure 4. Annual distribution of right of property infringement cases taken to the ECHR by years [22].

Most cases taken to the ECHR are related to the procedure, approach and values determined by the price determination commission. For eliminating these issues caused by the vulnerability within the legal framework of expropriation procedure, amendments were made to the Expropriation Law Number 2942 by the Law Number 4650 in 2001. Amendments made in 2001 is a milestone in terms of broadening the area of freedom given to individuals related to such procedure under the Expropriation Law [10]. Citizens claim their rights by considering the long judicial process taken to the ECHR with the thought that they suffer from forfeiture due to state practices. During this process, citizens confront the state, and such confrontation decreases reliance on the state. The amount of compensation to be paid becomes more of an issue in the expropriation procedure, which is an intervention on the right of property. Since the first paragraph of the Article 1 of Protocol 1 under the European Convention on Human Rights does not mention compensation at all, it is not possible and right to conclude that this provision requires full compensation for expropriation. For the compensation, the superior should be favored as a result of comparing public interest in the expropriation and individual interest related to the protection of the right of property [23]. Since dispossession occurs where expropriation is individual overburdening the particularly be avoided. Together with the legal regulations made in Türkiye in accordance with the verdicts of conviction by the ECHR, a decrease is observed in the number of cases filed. It is also known that the number of cases filed will be decreased by utilizing alternative land reclamation methods instead of expropriation.

3. Results and Discussion

In accordance with the first paragraph of the Article 18 of the Development Law Number 3194, "for lands and land lots with or without building in the boundaries of development, municipalities are entitled to combine them with each other, road oversupply and areas belonging to public institutions or municipalities, divide them into plots or parcels as per re-development plan, distribute them to beneficiaries as per single, shared or flat ownership basis, and have their registration procedures done ex officio regardless of the consent by owners and other beneficiaries. If such areas are not within municipal and urban area boundaries, above authorities mentioned are exercised bv governorship". The authority belongs governorship or municipalities as per the relevant provision. Development readjustment share is deducted as a legal tax or tax in kind from the real estate subjected to the arrangement in reply to the increasing value in development plan implementations. By this way, public spaces mentioned in the law is transferred to the public free of charge. However, it is also a rule that all the parcels subjected to the arrangement are eligible for single building plot as much as possible. During the distribution of lands and land lots subjected to the arrangement by municipalities or governorships,

sufficient area may be deducted from their surfaces as "development readjustment share" in reply to the increasing value due to the arrangement. However, development readjustment shares to be deducted as per this article cannot exceed forty-five percent of the surface of lands and land lots subjected to arrangement (before the arrangement) (Amended paragraph 3: Article 3/12/2003-5006/1). Development readjustment shares cannot be used for purposes other than public services needed to be established in the areas subjected to arrangement such as primary and secondary schools under the Ministry of National Education, roads, accesscontrolled highways other than motorways, waterways, squares, parks, car parks, playgrounds, green fields, prayer halls, and police stations and facilities for such services (Two additional sentences: Article 19/4/2018-7139/32). It is essential to compensate flood control facility areas within the area subjected to the arrangement from the remaining areas owned by the State Treasury subsequent to deduction of development readjustment share for purposes stated in this paragraph [24-26]. However, if failed to be assign sufficient area for flood control facility, from the surfaces of lands and land lots subjected to arrangement, additional share is assigned for flood control facility up to the percentage stated in the second paragraph after development readjustment share is assigned for purposes stated in this paragraph, provided that the development readjustment share does not exceed the percentage stated in the second paragraph.

Development Readjustment Share is defined in the Article 4 of the Regulation on Principles Related to Land and Land Lot Arrangement to be Made as Per the Article 18 of the Development Law. Accordingly, the value is the amount that can be decreased up to 35% from the surfaces or lands and land lots subjected to arrangement (before the arrangement) and/or the equivalent determined with the consent of the owner in case of unavoidable circumstances, provided that it is to be used for areas assigned to public services needed to be established in the areas subjected to the arrangement such as roads, squares, parks, green fields, and public car parks and not subjected to registration, and mosques, police stations and relevant facilities. The inclusion of real estate subjected to arrangement into public service areas required by the building plots established may be up to 35% at most. However, this percentage was increased to forty-five percent (45%) in accordance with the Article 1 of the "Law on Amending One of the Articles Under the Development Law Number 6785 and Certain Procedures to be Adopted on Structures Incongruent to the Development Law and Development and Anti-squat Law" Dated 03.12.2003 and Number 5006, which was published in the Official Gazette Dated 17.12.2009 and Number 25319.

Works for opening road developments to the public based on the implementation under the Article 18 of the Law Number 3194 are carried out by the General Directorate of Highways under the Ministry of Transportation and Infrastructure. The very first example of such work was the protocol dated 11.07.2006 and Number 10/3015 signed between the General

Directorate of Highways and Datça Municipality. Implementation of the Article 18 on the 80-hectare area within the boundaries of Datça Municipality was given out by contract and the procedure was accomplished with all title deed registrations done. Implementation of the Article 18 of the Development Law Number 3194 and Articles of Annex 1 of the Law Number 2981/3290 was realized for opening the North ring road upon the engagement dated 11.08.2006 and Number 2006/30-3 contracted between Kayseri-Erkilet Municipality and the General Directorate of Highways. Adana-Karataş Double Highway was opened to the public with the implementation of the Article 18 within the framework of the Contingency Plan upon the protocol signed. For opening the road within the region with the implementation of the Article 18 of the Development Law Number 3194, a protocol was signed between the 10th Regional Directorate of Highways and Trabzon Municipality on 10.03.2010. Trabzon Municipality accepted the implementation on the condition that the implementation expenses were paid by the General Directorate of Highways. Due to the protocols signed, the administration was relieved of expropriation expenses. Upon the protocol signed between Antalya Metropolitan Municipality and the 13th Regional Directorate of Highways on 28.08.2015, airport intersection between Antalya and Aksu was opened to the public with the implementation of the Article 18 of the Expropriation Law Number 3194. The General Directorate of Highways under the ministry of Transportation published the Internal Memorandum dated 12.09.2007 and Number 2007/101. This memorandum discusses the importance of development plan implementation. It is highlighted that the internal memorandum should pioneer in solving certain environmental issues. It is stated that favoring development implementation over expropriation for ring roads and city crossings will facilitate the development of infrastructure in the cities easily and properly.

The Article 18 of the Development Law Number 3194 was updated with the Article 9 of the Law Number 6704 by adding the expression "access-controlled highways other than motorways, waterways" following the term "road" in the paragraph. With such amendment, development readjustment share is ensured to be met for the route where the Canal Istanbul (Kanal İstanbul) project passes through. First, development plan works were accomplished within the region. Afterwards, a 45% deduction was made from the real estate. Thus, it was ensured that the rest was assigned as a building plot. It is possible to set up parcels whose agricultural quality is protected by the development plan decision.

In accordance with the Article 6 of the Agricultural Reform Law Number 3083 on Land Consolidation in Irrigated Areas, land consolidation is defined as follows: "To fulfill the objectives stated in this law, land consolidation may be realized by the relevant institution on demand or regardless of the consent by owners". Supportive measures may be taken by the relevant institution to expand land and to benefit more from credit facilities for encouraging land consolidation provided that priority is given to those on demand.

(Additional paragraph: Article 1 of the Decision Dated 23/02/2001 and Number 4626) In consolidation areas, depending on the project type, a share up to 10% is deducted from the land belonging to real persons and public and private legal entities for the area to be commonly used by the public such as a road or canal. Roads closed due to consolidation and road oversupplies are also used for the same purpose [24-31]. No price is paid for share. However, the land deducted other than the share is compensated from the equivalent area owned by the State Treasury if applicable. If this is not sufficient, then expropriation procedure is implemented for the area required. Transfer of land and land lots to the public is ensured with land consolidation.

4. Conclusion

Expropriation is widely used in Türkiye for introducing highway projects into the society. Public institutions and organizations are able to make expropriation on subjects restricted by law. In what situations and by which institutions the expropriation authority is exercised are restricted by law. In accordance with the Article 3 of the Expropriation Law Number 2942 amended by the Law Number 4650, the expropriation process shall not be started without an adequate allowance provided by the administration. Thus, the land and land lots needed by the public should be obtained by means of different implementations other than expropriation. Restricting the right of property for another public service cannot be against public interest. Expropriation can only be commenced with the decision of public utilities and processing highway projects in the improvement site into 1/5000 scaled Master Development plans and 1/1000 scaled implementation development plan. Road development can be opened to the public free of charge with the application of the provisions in the Article 18 of the Development Law Number 3194 ex officio for the area where the highway would pass in an urban area. In the cost optimization of the highway routes with the selected arrangement areas, maximum area is expropriated with minimum implementation cost. The deduction is lower if the public area in the planned area is small. If land and land lots are arranged in accordance with the Article 18 of the Development Law Number 3194 between the General Directorate of Highways under the Ministry of Transportation and Infrastructure and municipalities, these lands are ensured to be transferred to the public free of charge by imposing state withholding up to 45%.

Expropriation expenses of highway projects for public place excessive burden onto institutions. Necessary lands may be opened to the public by means of development implementations, provided that amendments for the implementation are made to a certain law. The best example to the above-mentioned situation was the inclusion of roads other than motorways under the responsibility of the Institution of Highways into the scope of development readjustment share in accordance with the 6th paragraph of Article 19 of the Law Number 6001 on the Organization and Duties of the General Directorate of Highways. In this sense,

these areas are ensured to be converted into the public property with the implementation of the Article 18 of the Development Law Number 3194 after development plans for the land route are prepared. For project areas intersected by a private property, areas intersected by highway and waterway routes can be transferred to the public with the implementation of the Article 18 of the Development Law Number 3194 and the Agricultural Reform Law Number 3038 on Land Arrangement in Irrigation Areas and relevant provisions. Land acquisition increases as the ratio of state withholding increases, resulting in the minimization of the expropriation costs. Public projects such as highway can be opened to public free of charge with development plan implementation in improvement areas and with land consolidation in rural areas having no development plan.

Conflicts of interest

The authors declare no conflicts of interest.

References

- Pellicani, R., Koç, K., & Özler, V. (2009). Kamulaştırmada Taşınmaz Değerlemesi ve Karayolları Genel Müdürlüğü Uygulamaları, Karayolları Genel Müdürlüğü, Ankara.
- 2. Çelik, K. & Aşık, Y. (2004). Emlak Vergisi Değerinin Piyasa Koşullarına Göre Belirlenmesi, Mülkiyet Dergisi, 52, 15-19
- 3. Cay, T., & Iscan, F. (2006). Optimization in land consolidation. XXIII FIG Congress, Munich, Germany, 1.11.
- 4. Çelik, K. (2006). Planlama ve imar kanunu uygulaması arazi ve arsa düzenlemesi. Devran Matbaacılık, Ankara.
- 5. Alkan, M., & Polat, Z. A. (2021). Lisans ve lisansüstü düzeyinde verilen taşınmaz değerleme eğitiminin değerleme lisansı sınavı kapsamında değerlendirilmesi. Geomatik, 6(1), 15-30. https://doi.org/10.29128/geomatik.650766
- 6. Ünel, F. B., & Yalpir, Ş. (2019). Türkiye'de taşınmazların değerini etkileyen kriterlere yaklaşım. Geomatik, 4(2), 112-133. https://doi.org/10.29128/geomatik.499681
- Yomralioglu, T., Inan, H. I., Aydinoglu, A. C., & Uzun, B. (2009). Evaluation of initiatives for spatial information system to support Turkish agriculture policy. Scientific Research and Essay, 4(12), 1523-1530.
- 8. Dale, P., & McLaughlin, J. (2000). Land administration. Oxford University Press.
- Uzun, B. (2000). Çevre yolu-mülkiyet ilişkilerinin imar hakları açısından incelenmesi ve arazi düzenlemesi yaklaşımıyla bir model önerisi. [Doctoral dissertation, Karadeniz Technical University]
- 10. Evren, N. (2012). Türkiye'de kamulaştırma çalışmaları için alternatif yaklaşımlar. [Doctoral dissertation, Selçuk University].

- 11. Ertaş, M. (2019). Education for real estate valuation in Turkey. International Journal of Engineering and Geosciences, 4(1), 8-15. https://doi.org/10.26833/ijeg.416336
- 12. Yalpir, Ş., & Ünel, F. B. (2022). Multivariate statistical analysis application to determine factors affecting the parcel value to be used mass real estate valuation approaches. International Journal of Engineering and Geosciences, 7(1), 32-42. https://doi.org/10.26833/ijeg.862563
- 13. Unel, F. B., Yalpir, S., & Gulnar, B. (2017). Preference changes depending on age groups of criteria affecting the real estate value. International Journal of Engineering and Geosciences, 2(2), 41-51. https://doi.org/10.26833/ijeg.297271
- 14. Gözler, K. (2003). İdare Hukuku, Ekin Kitabevi, Bursa. 15. Haklı, H., 2017, Arazi Toplulaştırma İçin Optimizasyon Tabanlı Yeni Bir Dağıtım Ve Parselasyon Modelinin Geliştirilmesi, [Doctoral dissertation, Selçuk University]
- 16. Hartvigsen, M. (2006). Land Consolidation under the new EU Rural Development Programme 2007-13
- 17. Tanrıvermiş, H. (2004). Arsa-Arazi Ayrımında Kriterler ve Değerleme İşlemleri, ANKÜSEM Kamulaştırma, Değerleme ve Bilirkişilik Eğitim Programı (Sertifikalı), Ocak-Nisan 2004, Ankara
- 18. Yomralıoğlu, T. (1992). Arsa ve arazi Düzenlemesi için yeni bir uygulama şekli. Harita ve Kadastro Mühendisleri Odası Yayın Organı, (73), 30-43.
- 19. Tüdeş, T. (1992). Türkiye'de imar planı uygulama yöntemleri. İmar Planlarının Uygulanması Semineri, 9-20
- 20.https://www.kgm.gov.tr/Sayfalar/KGM/SiteTr/Istat istikler/DevletveIlYolEnvanteri.aspx
- 21. Seele, W. (1982). Land readjustment in the Federal Republic of Germany. Land Readjustment, DC Health and Co., Lexingtons, Mass.
- 22.http://www.inhak.adalet.gov.tr/istatistik/2018/201 8istatistikler.html
- 23. Berberoğlu, A. (2004). Avrupa İnsan Hakları Mahkemesi Kararları İşığında Kamulaştırma Kavramı ve Türkiye Uygulaması. [Master's thesis, Gazi University]
- 24. Karakayacı, O., & Karakayacı, Z. (2012). Kentsel saçaklanma alanlarında arsa/arazı değerini belirlemeye yönelik yöntem önerisi. The Journal of Academic Social Science Studies, 5(4), 107-120. http://dx.doi.org/10.9761/jasss_98
- 25. He, Z., & Asami, Y. (2014). How do landowners price their lands during land expropriation and the motives behind it: An explanation from a WTA/WTP experiment in central Beijing. Urban Studies, 51(2), 412-427.
 - https://doi.org/10.1177/00420980134922
- 26. Sert, A. (2005). Kamulaştırma Amaçlı Arazi Toplulaştırma. [Master's thesis, Yıldız Technical University]
- 27. Yirsaw Alemu, B. (2013). Expropriation, valuation and compensation practice in Ethiopia: The case of Bahir Dar city and surrounding. Property Management, 31(2), 132-158. https://doi.org/10.1108/02637471311309436

- 28. Yomralioglu, T., Uzun, B., & Nisanci, R. (2008). Land valuation issues of expropriation applications in Turkey. Land Reform, 1, 80-90.
- 29. Schnidman, F. (1988). Land readjustment: an alternative to development exactions. Private supply of public services, 73-87.
- 30. Köroğlu, Ö. (1995). Kamulaştırma. Seçkin Yayınevi, Ankara.
- 31. Ayten, T. (2015). Kamulaştırma amaçlı arazi toplulaştırması. [Master's thesis, Selçuk University]



© Author(s) 2024. This work is distributed under https://creativecommons.org/licenses/by-sa/4.0/