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Transfer of Development Rights for Agricultural Land Protection in Izmir's Periphery: A Case Study in *Torbalı*

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Abstract
Turkey has been experiencing rapid urbanization and urban expansion since the 1950s. With the processes of decentralization, the city is increasingly being brought into rural areas, building pressure is increasing, agricultural production and natural resources are being destroyed, and rural areas are increasingly fitted with urban uses (shopping, tourism, leisure activities, etc.). Rural areas in close proximity to urban areas are more vulnerable to development pressures and are at risk of being abolished or abandoned. On the other hand, with the enactment of the new regulations Transfer of Development Rights is entered Turkish Planning System as a new and innovative solutions. However, there has been any available application of the TDR yet. The study's objective is to assess the TDR's effectiveness as a tool for protecting agricultural land on the periphery of Izmir's large metropolitan area. Izmir's *Torbalı* district was chosen as a case study regarding intensive agricultural activity. A bundle of techniques is used including a large survey analysis of the area. A hypothetical mathematical model was applied for assessing and transferring the market-base value for the agricultural land.
Keywords: Transfer of Development Rights (TDR), TDR for agricultural land's management, TDR as a planning tool.

1. Introduction

In line with global Western central liberalization, globalization and capital accumulation, the mode of production has been transformed, processes that decide on the spread of cities in space have changed as a result of technical advances in the fields of deregulation and communication / information technologies in the national economies. With the processes of decentralization, the city is increasingly being brought into rural areas, building pressure is increasing, agricultural production and natural resources are being destroyed, and rural areas are increasingly fitted with urban uses (shopping, tourism, leisure activities, etc.).

New waves of migration from rural areas to cities began after the 1980s, when big cities were affected by liberal economics and globalization (Akşit, 2006). Economic transformations, technological improvements, and organizational reforms are all fueled by the world's 80% urbanization (Leaf, 2016). This is the first time in the human history that a village or peasants as a way of life is fully urban[1] (Delaney, 1999: 191). The phenomenon of total urbanization of the population on a global scale is the most basic development issue of the twenty-first century, with the rapid growth in the people living in urban areas and the continuation of rapid urbanization.

Cities are the primary spatial component of the major global transitions. Metropolitan city growth now differs from past century models focused on a single core, in which urban density decreased as distance from the center increased, therefore *designating an urban form* is higly problematic (Levent, 2018: 636 - 637). It's becoming more difficult to distinguish between the metropolitan city, the smaller city, the town, and the countryside, and traditional notions of center - periphery aren't helping (Tekeli, 2004: 74 - 75). Moreover, states favor a pro-market strategy as a result of globalization and articulation to the global economy, which introduces new emphasis on large buildings islands, large-scale public investments, and fragmentation on the city's outskirts. These changes have a huge impact on rural areas. Agriculture productivity is declining (*de-agrarianization*), agricultural-environmental assets are becoming more difficult to safeguard, and the relationship between rural and urban areas is changing dramatically due to the new communication technology and transit opportunities. As a result, rural areas in close proximity to metropolitan areas are adversely affected by this transformation, and Turkey is one of the countries that has been most impacted and has quickly abandoned its rural ties (Keyder ve Yenal, 2013: 92).

With the winds of globalization and grounded changes, traditional land use planning has been criticized for its inability to deal with global phenomena and problems seen in major cities, and it has been brought to the planning agenda as a more flexible approach that welcomes more market-based solutions. Understanding these changes in planning, as well as developing policies, strategies, and new planning methodologies, is an unavoidable obligation. Traditional land use planning is designed to find a balance between conflicting uses and activity integration in order to make them economically viable. However, by its very nature, the same planning creates irreconcilable rent discrepancies between users by designating land allocation, which results in unintended externalities such as urban land increase or decline (Micelli, 2002; Alonso, 1960). As a result, innovative alternative approaches to overcoming externalities in the planning system, which traditional land use planning has long failed to address, must be introduced.

[1] On the other hand, some say that these assessments should be handled with caution (Radoki, 2002). It is underlined that disparities in definition in nations with huge populations, such as China and India, have a significant impact on global population. For example, administrative limit adjustments in China have resulted in 40% of the population being classified as urban (Radoki 2002: 27; Öğdül, 2010).

The key difference then would be the introduction of new instruments that use market forces to accomplish governmental policies rather than the old command-and-control approach of land-use planning (Micelli, 2002: 141). The new instruments are introduced and heavily discussed in the planning to overcome the inherited weakness of the planning, such as real estate taxation, land readjustment, and the creation of new property markets, are based on flexibility without intervening normative and compulsory, rather in the form of complementary or convincing, rather than normative and compulsory (Turner et al., 1996: 188). One example of this search is the transfer of development rights (TDR).

TDR as a market-based tool is included in Turkey's legal framework, it is unclear how it would be implemented. This research[2] was carried out to solve this problem and provide direction for future efforts. This study is discusses the need and applicability of the TDR as an instrument for facilitating the problems posed by conservation activities in the agricultural areas of Izmir, *Torbalı-Muratbey District.* By using a variety of techniques, the study investigates the difficulties associated with the conservation of the agricultural land covered by the strict restrictions because of the highly economic agricultural return and the high capacity soil feature in the Turkish Planning System; it then makes a quantitative comparison of market values between agricultural areas's both economic value and rural value as a property and associated restriction of the development property rights, with the areas where the urban development rights granted to the Land Use Plan (development plan, *imar planı*). Therefore, the amount of "transferable rights" based on the market value comparison is determined taking into account the factors affecting the property's market values and standards.

A large survey analysis of the case area is conducted, which includes land-cover changes og both Izmir and Torbalı District, development plan decisions, and how they affected agricultural land protection and the growth pattern of the *Torbalı-Muratbey* region in the Izmir Metropolitan area. Finally, in-depth interviews with authorities from various government agencies and property management employees are used to analyze market conditions and assessments. The physical characteristics of the location are also documented.

2. Literature review

2.1 The Concept of Transferring Development Right as a Tool of Planning

TDR can be defined as a type of transfer and purchase of development rights from areas where urban development is restricted for specific reasons such as farmland protection or nature conservation, etc., to the areas with high development rights (Tavares, 2003; Nelson, Pruetz and Woodruff, 2013). Thus, TDR is a planning tool, management model and market-based management procedure for transferring development rights from protected areas to development areas (Hin Li and Gan, 2013: 19). It is a very useful and effective measure to facilitate the implementation of urban development policies and it promotes the development of areas designated as new growth zones (McConnell, Walls, and Kelly 2007; Aken, Eckert, Fox, and Swenson 2008). TDR enables wider and more effective protection and reduces speculative pressure to guide urban development from protected areas to development zones. It also allows for the fulfillment of the principle of "equal distribution of the development rights" i.e., *social justice* by compensating for the restricted rights of immovable property (Curtis, Pagonis, and Roach 2008; Isildak 2012). According to Pruetz (2003), TDR is an application tool which encourages the *voluntary* transfer of property rights to the areas of the communities to be protected. It is an active application tool that transfers development rights to the host area (i.e., growth area) where development is demanded in order to reduce development pressure on the areas under tight restrictions.

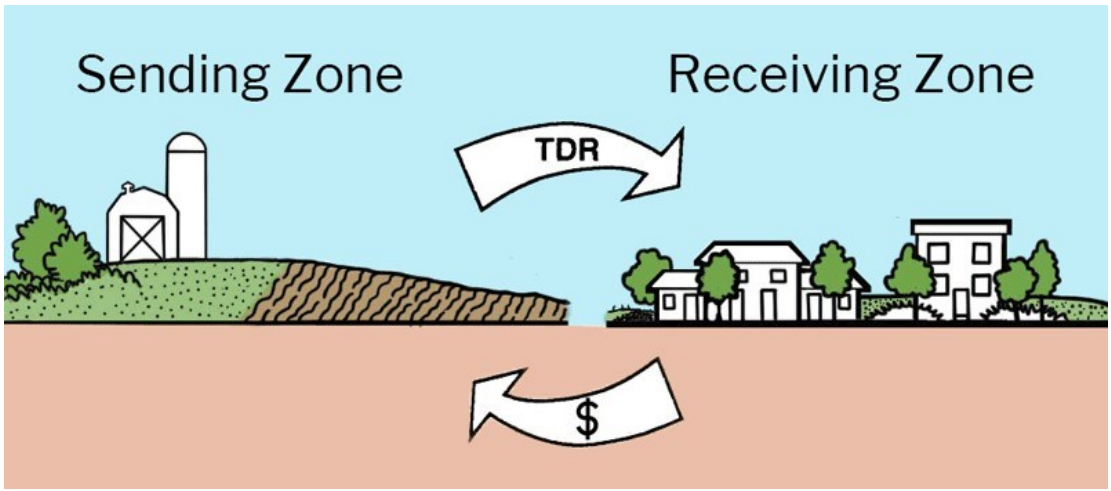


Figure 1. Sending and receiving areas with TDR (Chester County Planning Commision, 2022)

Additionally, it provides great convenience in situations where public resources are insufficient to meet the costs of restrictions or where the expense of protection is only imposed on the property's owner, thus ensuring the continuity and

[2] With a serious of the researches, we discussed the similar issues and TDR application for those conservation areas and TDR feasibility (**Güzle REF**).

efficiency of safeguarding by balancing gains and losses (Messer, 2007: 51). TDR programs may provide both flexibility against the strict protection rules of the nature protection areas and disaster-risk areas, farmland and heritage areas and, a systematic tool to help authorities achieve comprehensive long-term environmental and economic goals (Machemer and Kaplowitz 2002: 773). In TDR programmes, central or local authorities intending to exercise protective measures in areas or settlements that cannot be opened up to development or have lower zoning rights can do so *without any necessary payment*. When we look at the concept in terms of sustainability it ensures the protection and preservation of nature and farmland areas by guiding the stress of growth in other areas that need to be built by efficiently allocating public resources; i.e., planning and empowering people living in heritage areas.

The critical point in the TDR is that urban land is not subject to sales; only the right to urban land development can be transferred or purchased. The urban landowner may continue to use their property after selling their development rights. For example, after the development rights in a listed building or agricultural land have been sold, the landowner remains in or continues to make use of his/her building or continues to use land-based agriculture (Akcesme, 2006). Any property owner has rights that give direct sovereignty over his/her immovable property. TDR allows property owners to waive their property rights (construction, purchase or rent, use or restriction of other land use) in whole or in part and to receive payment as reciprocity for this procedure by transferring their rights to the receiving areas (Nelson et. al., 2013).

There are different opinions about the model's historical development when it first began to be applied. In 1916, first in New York, due to extensive urban planning, skyscrapers prevented the use of the sky by the surrounding properties, thereby limiting the height and prohibiting the construction of workplace manufacturing and housing units (Hanly-Forde, Homsy, Lieberknecht, and Stone 2014). In this way, property owners who have not yet reached the height limit in the adjacent parcel were allowed to sell those rights to be used in other parcels. The model emerged again in New York City, starting with the 1968 "Cultural Property Protection Act" (Yamak 2006), which permitted the transfer of the development rights of property owners not based on the lot or the adjacent plot, but throughout the city. The TDR was then intensively spread in the USA in the 1980s (Pruetz 2003). In reality, many TDRs initiatives in the United States are focused on agriculture protection or natural areas.

The TDR program has four basic components (Machemer and Kaplowitz 2002, 775). The first is the areas where the immovable is to be protected (*sending area*) and the second is the areas to be developed (*receiving area*) (Figure 2).

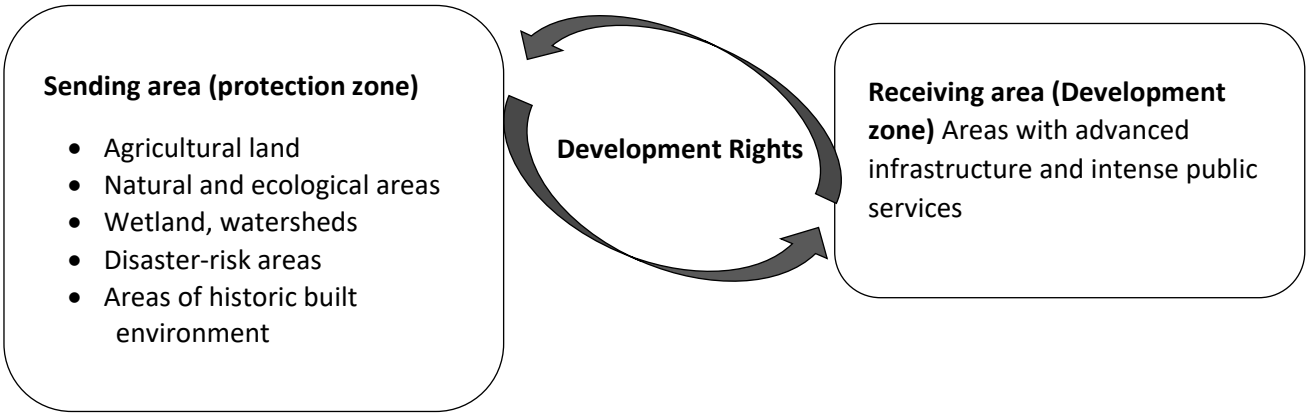


Figure 2. Sending and receiving area concepts (Guzle and Akpınar, 2019)

While TDR is meant to safeguard equal distribution of the development rights, it means different things to different people. Immovable property owners, for example, can profit by selling their rights and simultaneously selling or transferring their rights to another buyer on the market. Developers, on the other side, can purchase more immovable rights and profit from the plan's increased density. The planning offices, as a prominent player, reaped numerous benefits from the use of TDR. By implementing buffer zones, green belts or limiting development densities, local governments can redirect urban development to areas where they want to expand while reducing development pressure on protected areas.

TDR may be transferred in two ways under the Law, depending on the nature of the property under protection status: partially or totally. The property ownership of the immovable property (i.e. watery agricultural land and high capacity soil) is maintained in partial transfers. In this instance, however, the property owner is required to do continuation of the agricultural production for the land's protection in accordance with the protocol to be signed with the relevant administration (Guzle, 2019). The property rights of the immovable property change with all of its elements in the case of a full transfer of development rights, and the immovable property is wholly owned by the public. In this instance, the landowner receives a certificate confirming his development rights, and his ownership is transferred to the public.

Reselling a property that has been transferred to the general public is prohibited by law. In other words, a property owner who has lost his or her development rights certificate; (1) use the property, (2) benefit the production fruit, (3) possess, sell, rent, bequeath, mortgage, or just *use* his/her property (Isildak 2012, 98). Despite the fact that the Law makes no provision for the design and determination of receiving areas, the area to be transferred is first selected from the relevant municipal

boundaries, and if there is no room for a receiving area, it is expected to be used in other areas determined through joint programs with other public institutions (Guzle,2019).

3. Brief Info About the Turkish Planning System

Conventional land use planning and zoning are the most prevalent tools used in traditional planning to regulate urban development. The essence of the management of the urban development is the separation of conflicting functions (zoning) in design and the transportation network built between these activities (Amen & Nia, 2020). Building Permits distributed are granted or rejected based on whether they are compatible with the rules of the regions defined in the plan (Aziz Amen,2022). In this way, undesirable development is controlled and blocked, but the development is not ensured in the suitable place and form (Albrechts, 2008). The fundamental problem in traditional land-use planning is that the zones grow complex by changing after they are first created and becoming complex, and by substituting functions in response to property owners' requests. All of these issues are related to the ineffective use of land management (Talen, 2013).

In the Turkish Planning lack of integrated planning approaches since 1980s is the well-known fact; however, the idea of planning can never be rejected. Although the Turkish planning system has not been new, extended till the late Ottoman Era, however, today the planning is in deep crisis, fragmented, chaotic and far from being preparation for the future. Planning under these conditions causes anguish and frustration amongst planners in the neoliberal era (Eraydın and Tasan-Kok, 2013: 229). This may be the main reasons why market-based tools like TDR can not even offer planning professionals a place to debate. Hence, the main objective of this study is to demonstrate the potential that TDR offers as a planning tool and as an efficient way of incorporating urban growth energy into planning while preserving and contributing to urban resilience, preservation of the farmland area and environmental, i.e., better policy outcomes, in terms of efficiency and equity.

The conventional land-use planning is conducted and regulated by the Law no. 3194 i.e., Reconstruction Law[3] coming into effect in 1985 and related regulations in Turkey. The Reconstruction Law is responsible for the land-use management and also draw the spatial structure as overll shape i.e., urban macroform of the metropolitan cities in general (Ataöv and Osmay, 2007).

This model is meant to control land-use and land-use changes at local level. In the model urban growth is controlled through Urban Development Plans (*imar planı*). The planning powers were transferred to municipalities with the enactment of the Reconstruction Law and the resources transferred to the municipalities were increased. In almost all major cities, comprehensive planning and zoning have been started. The approval authority for local physical plans was transferred from central administrations to municipalities which began to make frequent use of plan changes which can be taken as a form of deregulation.

As Turkey has opened to the world order and transitioned to the global economy, the intense commodification of the housing and land market have resulted in a construction boom and never-ending construction facilities in Turkish cities. The socio-spatial configuration of the big cities including Izmir has impacted most of these developments. The rapid commodification of land resulted in speculative construction activities and a drastic rise in housing prices which gave way to the construction boom (Erol, 2019: 738) eventually resulted in the rise of the land and property prices. Many forms of deregulation with the Reconstruction Law were provided in the planning system in order to ease the massive construction activity or circumvent the bueuracratic process of planning. For example, a form of dergulation for obtaining planning powers is very common provided to various central government ministries with their sectoral priorities or special plan planning powers (Balaban 2012; Eraydın 2012). For these reasons agricultural areas in close proximity to major cities are vulnerable to conversion, placing agricultural production at threat.

Between 1960-1990 the implementations of the conventional land-use plans are of the large density increases that were not so commonly enforced that the urban fabric was developed in accordance with the "regional floor layout" plan[4]". In conjunction with the neoliberal transition, development changes in response to the rise in density should not be matched with the required increase in public services that has begun and spread through broad urban regions. Especially in 2000s the super high-rise structures has become dominant figures of the city scape and with the ease of related changes in planning legislation[5] and in planning to control of the high-rise construction has getting more and more difficult task in the Nation. Today, however, the density rises, many times followed by peculiar legal applications, in a very unregulated manner (Cavusoglu, 2016: 142).

The connection between planning system and real-estate sector before the 1980s had depended upon the purchase of the both rural and urban land in the market, but this has changed with the globalized era and there has increased substantial studies revealed the powerful real-estate institutions or companies manage and manipulate the land market in urban sphere to a varying degree to all over the world (Tiesdell and Allmendinger, 2005). Negative effect of the world-wide globalization,

[3] Law no. 3194 *İmar Kanunu.*

[4] In 1965, Law No. 634, "Condominium Legislation" (*Kat Mülkiyeti Yasası*) was enacted and accompanied by plans for "regional floor layout" (*bölge kat nizamı*), the existing building stocks in the legal and formal part of the cities were almost completely demolished and then renewed into very similar, uniform apartment blocks dotted around the city's legal-formal part. Single ownership was given for each individual housing unit (not land ownership) in one block of apartments constructed onto one urban plot so that the multi-ownership pattern was available in one urban land plot. The actors come in with these applications; land parcels ownership, developers with limited capital and households with limited income (Gunay, 2005). The large squatter areas were built out of the formal planning domain, surrounded particularly by state-owned land at the vicinity of the city's core areas.

[5] "Very high rise building", for example in the Law of 644, "The Establishment of the Law of the Ministry of Environment and Urbanization" (2011).

privatization has brought substantial impact to the planning in general. Turkish case represents both the global restructuring which took place on a planetary scale, however bears also internal characteristics. Practices in the Turkish case should not be confused with worldwide examples as applications that go beyond market or global logic were already developed. While not all groups in society opposed all these implementations and the matters were also referred to the public court very common. However, it is needlessly to say that the problems brought by globalization and its local translation and interpretation have not promoted a kind of awareness on part of governments, society and citizens of the need for innovation in social policy and land management. After a break in centralized and integrated approaches in planning a new and approach has to redevelop and revise which recovers the institutional and managerial framework of planning.

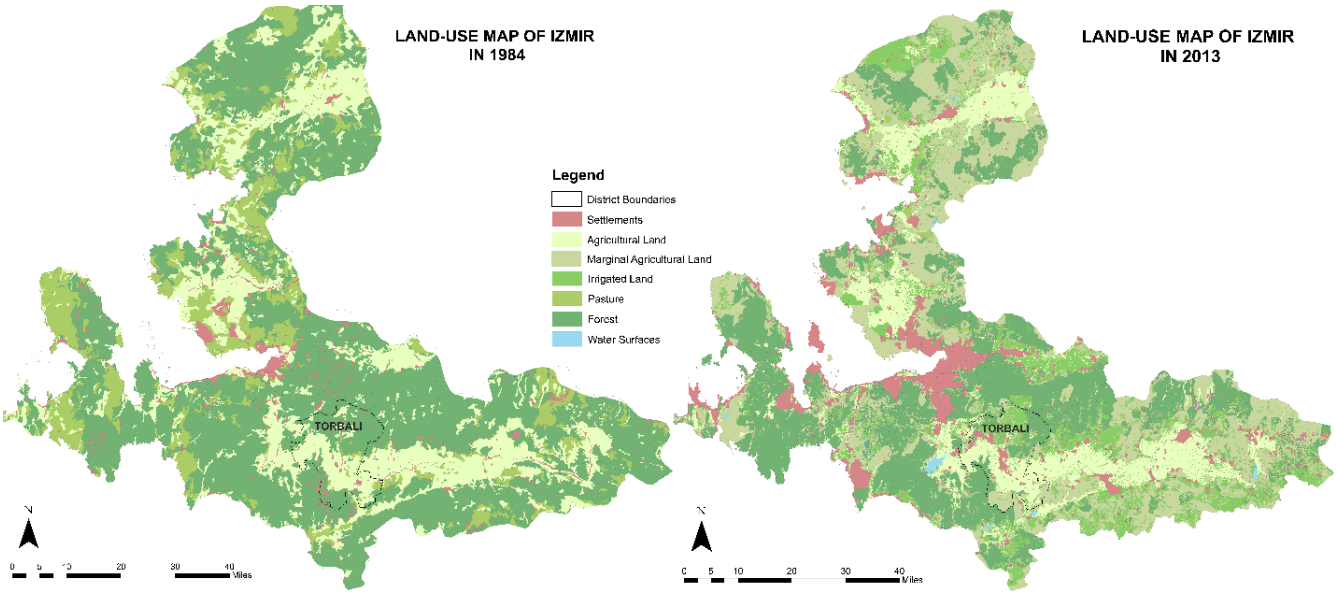


Figure 3. Land-use change of İzmir between 1984 and 2013 (Izmir Special Province Administration, 2013)

4. The Conversion of the Agricultural land into urban parcels in the Turkish Planning System

In Turkish Planning system, converting cadastral land into Urban Parcel (Land), is only possible with the implementing the Urban Development Plan which was specified in zoning bylaws. The local administrators are responsible to provide substantial number of urban parcels and areas for the population's future demand for development under the Article 18 of the Zoning Law No. 3194.

The amount of potential development land (or urban parcels) should not be less than the number of construction licenses issued the previous year. Known as the colloquial "dough rule" (*hamur kaidesi*, Article 18[6]) regulation application in the Turkish Planning system, after the required land readjustment, up to 45 percent of the land should be reserved for public use for the reciprocity of the anticipated (expected) increase in land value. The public land then is used for education, health, and green areas which necessitate those populations living in the residential areas. In this application, the assessment procedures are based solely on the size of the land parcels[7]. This can be considered as a private property public control mechanism by laws.

Another regulation related to the conversion of agricultural land into urban lots is the "Land and Land Use Law"[8]. In accord with the bylaws and related regulations, agricultural land is categorized under various statuses with regard the soil classification and agricultural potential. As per ordinances and standards, agricultural land is defined as "absolute agricultural land", "special cropland", "marginal crop land", and "planted land", depending on land classification and agricultural potential. Furthermore, "watery agricultural land" is defined as agricultural lands irrigated by necessary infrastructure by the Ministry of Agriculture and Forest. The rest of the agriculture fields (which aren't irrigated) is dependent on climatic factors like rainfall. Farmlands classified as watery land, without a doubt, are regarded to produce the highest value of crops.

Article 13 of the "Land and Land Use" Act regulates the use of agricultural lands for purposes other than agricultural production. It states that "watery agricultural land", "special product lands", and "planted agricultural land" *will not be employed for purposes other than agricultural production* (*Agricultural Lands Used for Non-Agricultural Purposes,* Article 13[9]). However, the Ordinance includes various deregulations and exceptional circumstances that allow agricultural areas to be opened up to non-agricultural activity under certain conditions. If the central and local administrators are unable to find

[6] It is a regulation on land land regulation principles to be established in accordance with Article 18 of the Zoning Law (R.G. 02.11.1985 / 18916).

[7] The other parameters such as location, conservation status, and volumetric consideration do not constitute part of the value assessment.

[8] Law No.5403, "Land and Land Use Law" (R.G. 19/7/2005-5403).

[9] Law No.5403, "Land and Land Use Law" (R.G. 31/1/2007-5403).

substitute land for the designated land uses, the Ordinance can allow agricultural property to be used for non-agricultural purposes (Table 1).

Table 1. Exceptional cases for the conversion of agricultural land into non-agricultural uses

1.	Strategic need for defense
2.	Temporary Settlement Requirement after Natural Disaster
3.	Petroleum and Natural Gas Search and Operation Activities
4.	Mining activities
5.	(Public interest) Road infrastructure-upper building activities
6.	Energy source areas
7.	Geothermal-based technological greenhouse investments.

Although the Ordinance establishes a strict conservation status for agricultural land, it also allows for some flexibility, such as the transformation of agricultural lands into urban land with a “appropriate” view obtained from the local municipal administration and the provincial directorate of Agriculture10 in the administration of the city’s metropolitan areas to transform cadastral parcels (agricultural field, vineyard, garden, etc.) that are not directly included in the local development plan’s limit. Furthermore, illegal constructions on agricultural fields that authorities seem unable to manage or condone are indeed widespread (Figure 4).

Figure 4. Incompatible structures built on agricultural lands in Torbalı
(https://earth.google.com/web/search/torbal%c4%b1/)

Traditional land use planning is also known to be ineffective in the face of illegal developments spreading quickly over agricultural lands near urban limits and incapable of demonstrating the necessary control; on the contrary, authorities may have approved practices that make it difficult to protect agricultural land with Development Plan zoning decisions.

[10] Provincial directorate of the Ministry of Agriculture and Forest.

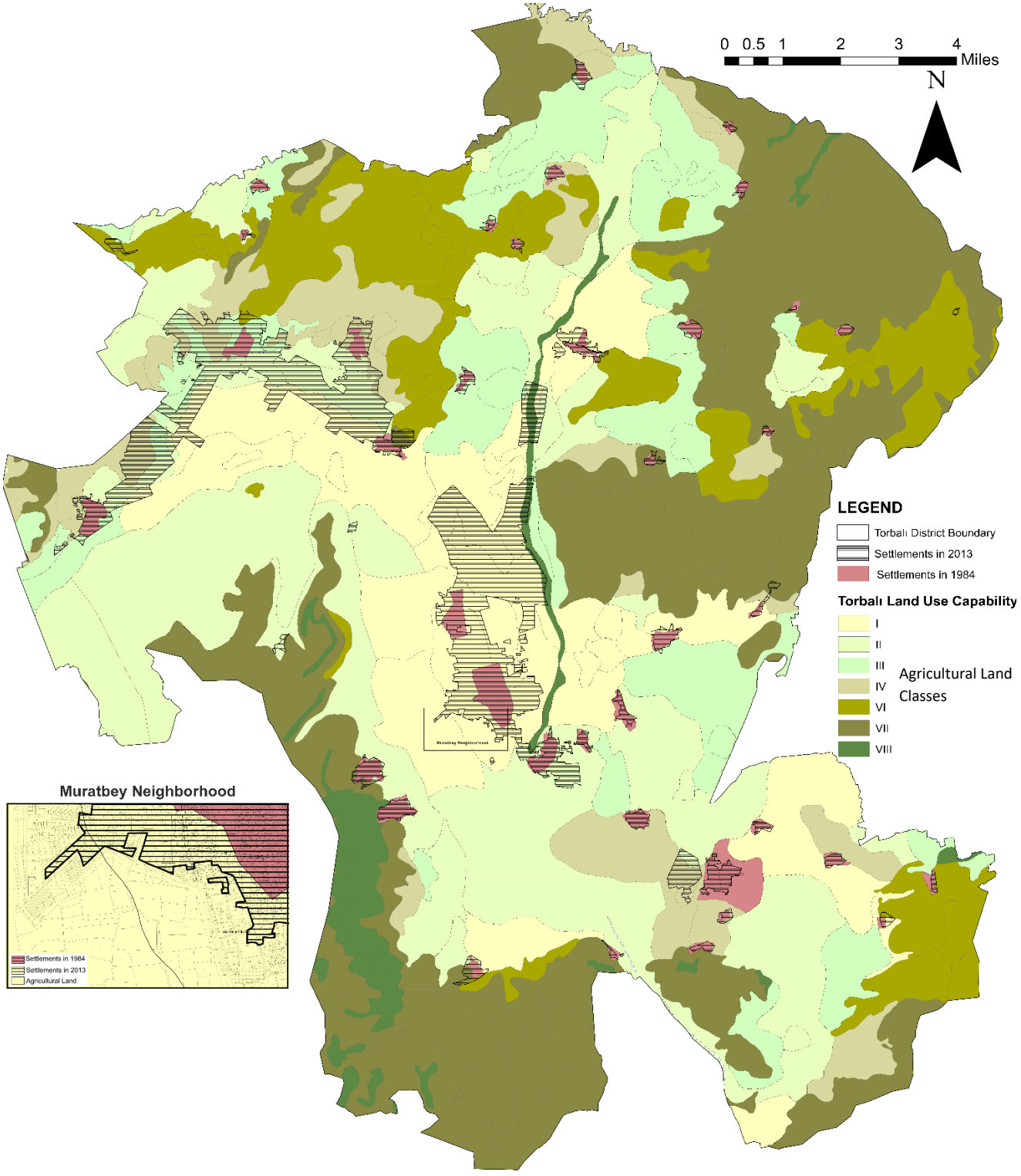


Figure 5. Torbalı's Agricultural Land-use Capability Map (Izmir Special Province Administration, 2013)

As a result, public lands in general and agricultural land in particular can be easily sell out private people, real estate agencies, organization, or even transfer in Turkish case. The maps and statistics of the agricultural land exchange in Izmir and Torbali show that agricultural areas have been substantially changed and covered with diverse urban purposes by years (Figure 6). Izmir's agricultural land has decreased by 15.25% since 1995 and Torbalı's agricultural land decreased by 25,57% from 1995 to 2015 (TURKSTAT, 2022).

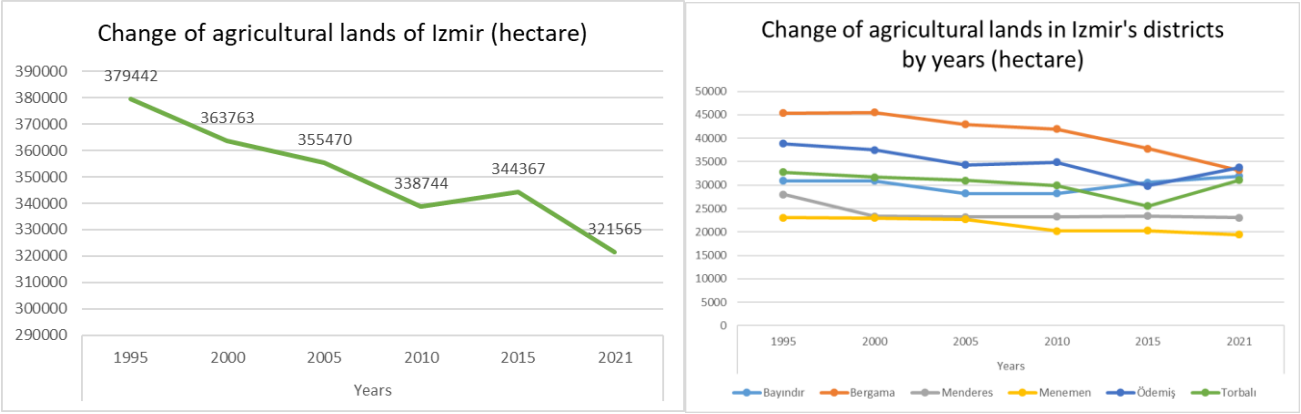


Figure 6. Change of agricultural lands of İzmir and some selected districts (Source: TURKSTAT, 2022)

Another major concern is the populist policy of amnesty laws and normalization of illegal developments. The most important regulation, which recently reorganized the zoning rights and caused confusion in the venue and on the legal plane, was enacted by law no. 7143[11] under the name of "zoning peace" despite being a zoning amnesty (2018). The most comprehensive of the zoning amnesty slated for Turkey's urbanization date came into force ahead of local elections on June 24, 2018. This does not contradict the nation's populist policy characteristics. With this law, amnesty has been introduced to almost all illegal structures.

Amnesty laws is not particularistic rearrangements of the development rights heavily related with the Turkish politics popular character, however, this rearrangement of the amnesty under the rubric of "peace" was the most extensive one and has been introduced to almost all illegal structures by paying a fee. To summarize, the idea that "the state forgives one day anyway" has become internalized in large parts of society, resulting in an increase in illegal construction and rendering the regulatory and control mechanisms of planning obsolete.

As a result, our findings reveal that traditional land-use planning and execution by local authorities has significant flaws and limitations when it comes to protecting rural regions and regulating urban expansion in a sustainable manner. Traditional planning methods have a number of shortcomings when it comes to managing externalities and guaranteeing social equity in development rights allocation. The need for structural rehabilitation is urgent, and it is hard to include new tools like TDR as a supplementary and corrective strategy for long-term sustainability within such a planning framework. However, as planners, we want to believe in more active and socially accepted planning with the space that history has created and the trickle-down impact of international policy applications (Amponsah et. al., 2022).

5. TDR Model

5.1. Land Value Assessment for the Agricultural Land

The concept of "**value assessment**" lies at the rationale of the transfer of the development right. Determination of the concept of "value" and strict clarification of its parameters are crucial in TDR applications. Before the transfer takes place, factors such as the market price value of the sending and receiving areas where the transfer will have departed from and completed, the size of the parcel in the region, and the number of building density should be defined precisely. The TDR program, which is explained in a clear and detailed manner, will both ensure that the model is carried out effectively and that owners can understand the transfer of development rights and use the programs (REF). Technicians and administrations have developed criteria and methods to establish land classifications capable of ensuring fair and equal treatment of property in order to appropriately categorize each property. The segmentation of conversion areas is determined from an economic standpoint as a result of their effective usage, which reflects either their actual or potential value (Micelli, 2002). The expected land rent is determined by anticipated urban trends as well as future urban planning and specific spatial projects.

Agricultural production is dependent on the availability and existence of soil as a resource. Agriculture's viability is heavily dependent on the supply of soil and the continuity of production, which can be seen of as insurance for rural landowners and communities.

The "**direct comparison valuation methodology**" is commonly used one in the land valuation in Turkey. The factors and method of the land valuation is stemmed from the "Expropriated Law" (R.G. 2942/8/11/1983). The valuation of the agricultural land is done by the principles stated in the article 11 and 15 which is named as the "Principles of Determination of Expropriation Fee[12]". The value of the land (expropriation fee) is evaluated according to the **net income** to which the land is used according to the location and conditions (11/1-f of the Law).

[11] Amnesty Law, No: **7143. The name of the Law is "Development peace" (R.G. 18.05.2018 / 30425)**

[12] (R.G. 2942/8/11/1983). "*Kamulaştırma bedelinin tespiti esasları"*

In Turkey, the "direct comparison value methodology" is widely employed. The "Confiscated Law" (R.G. 2942/8/11/1983) established the criterion and method for assessing land value. The "Principles of Determination of Confiscation Fee" are used to value agricultural land. The valuation of the land (confiscation fee) is calculated by the **net income** generated by the land, taking into account its location and characteristics (11/1-f of the Law). Although the parameters to be considered in the evaluation are specified in the law's titles, court decisions have largely shaped what they mean and how to apply them (Aslan, 2020).

In accord with the "direct comparison method" to appraise properties inside the zoning plan's allowed limit and parcels outside of it, we first calculated the net income from agricultural yields (Table 2). According to "Soil Law, No. 5403, the designated agricultural area for the assessment is a first-class watery agricultural land with absolute protection status (Fig 5). Before calculating the net income of agricultural land, the cost and productivity of the crop grown on that property must be determined. Because land that is currently being used to cultivate a profitable crop is less likely to be sold for urban expansion. The larger the profit, the more likely the farmland will be preserved. It is known that agricultural land can only withstand urban sprawl if the profit from agricultural production surpasses the benefit from urban expansion (Catalan, 2008: 180-181).

For the valuation of the agricultural land named as the" income capitalization method" commonly used in Turkish agricultural property appraisal for those areas located away from 1,5 km and more than 1,5km. First **(1)** the net income obtained from the agricultural production is calculated; and then **(2)** the price of the land with respect to the its proximity to the urban area is appraised. For this appraisal the capitalization rates of interest are employed in accord with the decisions for the stable High Court's[13] Judgment and Ordinaces. The percentages are used as the capitalization rate as follows; Four percent (4%) for wet agricultural land, five percent (5%) for dry agricultural land, and seldom six percent (6%). Capitalization interest on high-value agricultural products is low, but when the product's economic value declines, the interest rate rises.

For the calculation of net income is as follows: 1) It is common usage that the farmers of Torbalı region, there is a four-year round change for the agricultural crops to protect the soil's productivity and economic return from the production. It has to be taken into account that, once in a four year the crop type has change to protect the soil fertility. Tomato, cabbage, corn, cotton, and green peas are among the crops planted cyclically in Izmir's agricultural production system. For instance, first year it is assumed that tomato and cabbage are cultivated; the second year grain corn; the third year is cotton; and finally green pea and silage corn. This crop list is commonly used one in the Izmir's agricultural system especially for those watery agricultural field[14] (see Table 2). For the second step (2) The economic return of the product is divided by the capitalization rate to find out the net land price of the agricultural property. The formula can be seen below.

Table 2. Average agricultural product income and costs in Izmir ((Agricultural Directorate of Izmir, 2021)

Crop	Total Area (da)	Yield (kg/da)	Price (TL/kg)	Product Cost (TL/kg)	Net Income (TL/da)
Zucchini (Gum)	200	3,000	1.50	1.41	268.83
Celery (Root)	2,460	3,041	2.50	2.33	515.81
Cabbage	**350**	**3,500**	**2.00**	**1.34**	**2312.43**
Cotton	**241,885**	**550**	**11.44**	**7.23**	**2315.26**
Green Peas (Fresh)	**6,200**	**1,300**	**3.60**	**3.01**	**759.42**
Pepper (Charliston)	503	4,012	3.03	1.80	4,939.82
Tomato (Paste)	104,803	9,359	0.64	0.58	608.30
Tomato (Table)	**14,801**	**6,371**	**2.28**	**1.12**	**7,360.25**
Engineer	8,437	1,362	7.56	4.03	4,810.05
Cucumber (Table)	1,323	4,249	2.91	2.13	3,336.03
Zucchini (Gum)	200	3,000	1.50	1.41	268.83
Celery (Root)	2,460	3,041	2.50	2.33	515.81
Lettuce (Aysberg)	100	4,250	1.50	1.06	1,854.92
Corn (Grain)	**98,771**	**1,307**	**2.49**	**1.84**	**847.95**
Corn Silage Rack	**452,129**	**6,711**	**0.47**	**0.38**	**625.72**
Aubergine	905	3,312	2.01	1.68	1,090.18
Leek	7,930	4,015	1.93	1.82	442.27
Onion (Dry)	700	5,000	0.90	0.60	1,482.69

[13] The capitalization rates of interest in stable High Court (*Yargıtay 5. Hukuk Dairesi*) judgements are 4 percent for watery agricultural land, 5 percent for dry agricultural land, and seldom it reaches 6 percent.

[14] This information has been gathered from the interviews with Izmir's Agricultural Directorate, farmers and agricultural engineers working on the fields.

The formula was applied to all of the crops grown in the provinces of Izmir, and data from the Izmir Agricultural Directorate revealed that the tomato was the most productive crop (Table 3).

Step 1. The calculation of crops' net income
The formula: **(A – B) X C**

A: Price	C: Yield
B: Product Cost	D: Capitalization rate

To calculate the net income of tomato (table);
(2,28 – 1,12) X 6,37 = 7360.25 TL/da

Step 2. The calculation of the land value
The formula: **(A – B) X C / D**

To calculate the land value of tomato (table);
(2,28 – 1,12) X 6,37 / 0.04 = 184006.21 TL

Table 3. Calculation Method of the Net Land Price

Annual Round Change	Crop	Yield (kg/da)	Price (TL/kg)	Product Cost (TL/kg)	Capitalization Rate	Net Income (TL/da)
1st Year	Tomato (Table)	6,371	2.28	1.12	0.04	7,360.25
	Cabbage	3,500	2.00	1.34	0.04	2,312.43
2nd Year	Corn (Grain)	1,307	2.49	1.84	0.04	847.95
3rd Year	Cotton	550	11.44	7.23	0.04	2,315.26
4th Year	Green Peas (Fresh)	1,300	3.60	3.01	0.04	759.42
	Corn Silage Rack	6,711	0.47	0.38	0.04	625.72
Total Net Income (TL/da)						14,221.03
Annual Net Income (TL/da)			14221.03 / 4			3555.26
The Value of 1 Decare of Land			3555.26 / 0,04			88000.00
The Value of 1 Square-meter of Land			88000 / 1000			**88.00**

This calculation is valid for the locational appraisal of the agricultural land. For the proximity parameter away from urban center we use four rings according to the length in meters respectively 200m (the closest first ring to the urban area), second ring 400m, third ring is the 1,5 km, and the most remote areas (Fig 7). The fourth ring the calculation is as follows. The result according to the method indicated in the Table 3 is equivalent to the value, **88.000 TL/Decare**[15] for the watery agricultural land.

5.2. Land Value Assessment for The Urban Land

The method was employed for the appraisal of the urban land, which is known as the "construction right in return for flat" in Turkish Planning System. For this **(1)** it is derived the substantial number of sales data of the residential unit that reflects the market price of the property[16] as stated in the title deed. The criterias for the selection of the residential units are; 1) it has to be located in the Urban Planning Area. And the second (2) it has to be close proximity to the agricultural land, and finally (3) Recently sold residential units (Table 4). Then the average selling price has obtained which was 7000 TL/m^2 according to the selected residential units.

After the calculation, the Development Plan's building permission has taken into account to find the land value plus the building value, which is constructed at this land. Let's explain in the sample. Suppose we have a 4-story residential building on a 333.33 m^2 plot of land with respect to the building code of the Torbali's Development Plan which is 0,30 building footprint ratio (BFR) and 1,20 is the floor area ratio (FAR). The ground floor size is 100 m^2, whereas the rest of the flats are 115m^2. The floors prices are not the same because of the climatic factors. The ground floor's price is the lowest and the top is the second lowest, on the contrary the mid-floors are of the the highest price. To calculate each floor's price, we use index which are 0,925 for the top floor, 0,91 for the ground floor for the normalization of the price. The ground and top floor's price are lower than the mid-floor because ground floor generally has the lowest floor space whereas the top floor has some

[15] Decare (*dönüm*) is the land measure of the 1000 m2.

[16]Sahibinden.com is a popular website in Turkey for selling real estate, automobiles, and other items. It is a website that allows users to post commercials and conduct e-commerce transactions in a variety of categories, including real estate, autos, retail products, and services.

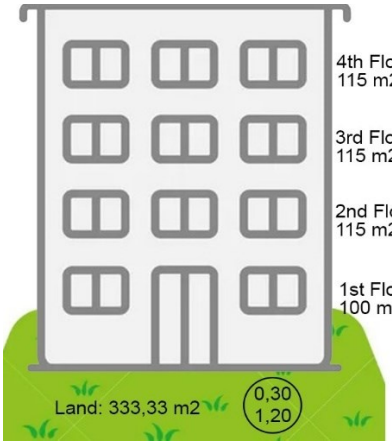
kind of climatic inconvenience stemmed from heathing, wind and escalator, etc. (Table 5). As a result, the **total value** of the sample building is **2.992.000** TL (the value of the urban land located in the Official Development Plan of Torbalı).

Step 1. Determining housing prices in the immediate vicinity and the average market value for a housing unit

Table 4. Calculation Method of the Average Price of a Housing Unit

	Housing unit price (TL / m2)	Gross area (m2)	Price (TL)	Number of floors
1	7500	100	750 000	5/5
2	6950	100	695 000	2/6
3	6896	145	1 000 000	5/6
4	6650	100	665 000	3/4
Total	27996			
Average price	27996 / 4	7000 TL/m2		

Table 5. Calculation Method of the Average price of a Housing Unit



	A	B	C	D
	Housing unit price (TL / m2)	**Gross area (m2)**	**Index**	**Price (TL)**
1st Floor	7000	100	0,91	637 000
2nd Floor	7000	115	1	805 00
3rd Floor	7000	115	1	805 00
4th Floor	7000	115	0,925	745 000
Total Price (TL)				2.992.000
Formula to find each floors price			D = A X B X C	

Step 2. Determining net income of the urban land by using 'construction right in return for flat' index

Formula = (A X B / C) / D = (2.992.000 X 0,45 / 1,20) / 333,33 = **3366 TL/m²**

A: Total price

B: 'Construction right in return for flat' coefficient (It is **45%** for Torbalı)

C: Cash payment coefficient (**1,20**)

D: Land area

Step 3. Converting urban land value into the cadastral land value;

3366 X 0,55 = **1850 TL/m²**

The next step (**2**) is to find out the net income which is calculated by utilizing the normalize index. The index named as "the rate of the construction right in return for flat" is generally **45 percent** in Torbalı and determined by the responsible bodies and multiple agents[17]. The developer's share in the total value (2.992.000 TL) of the property is equal to 55 percent of the property whereas the landowners' share is the 45 percent. The landowner either got the value in cash or have the residential unit with respect to the 45 percent. If the landowners would prefer actual payment in cash the coefficient **(1,20)** has to be taken into calculation for the risk the constructor for the marketing of the property and to encourach the constructor keep on the building activities. The share of the landowner is (2.992.000 X 0.45) equivalent to the 1.346.400 TL and when this value is divided by the 1,20 the net gain for the property owner is equal to the 1.122.000 TL. The unit value square meter is then 1.222.000/333.33 (the land size), which is **3366 TL/m²**. This value is the net income obtained from the urban land.

The final step (**3**) is to convert urban land into the cadastral land value for the comparision in-between urban land and agricultural land. This is crucial in the Turkish planning system for the conversion of non-urban land (agricultural land included) into the urban land "land readjustment process" is used known as the "dough rule" (*hamur kaidesi*, Article 18). This readjustment is utilized as a private property public control mechanism because after the required land readjustment,

[17] After calling various real-estate consultors and constructors we learnt that the ratio is 45 percent for the Torbalı. This ratio is 50 percent for Izmir's central areas whereas it is 45 percent for Torbalı because the district is far from the central areas and the existence of the large scale agricultural production.

up to 45 percent of the land should be reserved for public use for the reciprocity of the anticipated (expected) increase in land value. In our sample 3666 TL/m^2 X 0,55 is approximately equal to the **1850 TL/m^2.**

In accord with the applications by the Izmir Greater Area Municipality's Real Estate Appraisal Unit (*Emlak Yönetimi Daire Başkanlığı*) the differences between urban and non-urban (agricultural land) land values is of the **one-and-four** rate between the lands in the areas 200 m away from the approval limits of the Development plan's and the urban areas. This is equal to the (1850 / 4) = 460 TL/m^2. And the next ring is of 400 m far from the approval boundary and the land in this ring is **two-and-third** and the value for this ring is equal to 460 X (2/3), which is approximately **300TL** (Table 6).

Table 6. The estimated amount of TDR removed from the sending area

	Features of the rings	Distance to the Boundary of the Development Plan (urban areas)	Indexes	Land value (TL/m2)	The estimated amount of TDR removed from the sending area
Within the planned urbanized zone	Land from the Development plan's approval boundary	-		1850	-
1st ring of the agricultural land	The land with the highest expected rent (waiting for including official development plan's building rights)	200 m	¼ (of the urban land value)	460	0.25
2nd ring of agricultural land	The land with high expected rent (waiting for including official development plan's building rights)	400 m	2/3 (of the 1st ring value)	300	6,2
3rd ring of the agricultural land	Objective value increment[18]	1.5 km	Income capitalization calculation	110	16
4th ring of agricultural land	Pure agricultural land, no pressures of the construction, further away urban area	more than 1.5 km	4/5 of the 3rd ring value	88	21

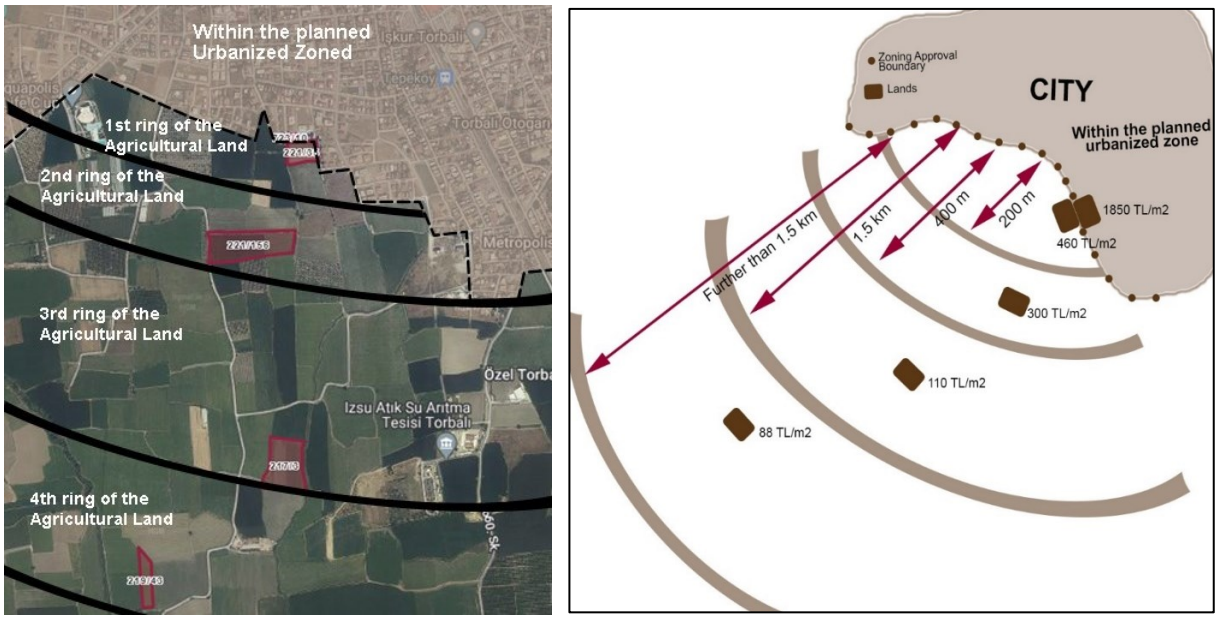


Figure 7. The agricultural land rings of Muratbey Neigborhood

6. Conclusion

TDR, as a planning tool, compensates property owners for economic losses caused by development limitations or downzoning, rather than the state paying for the confiscation of the property. The determination of how many TDRs to issue

[18] The "objective value increment" ratio is obtained from the Court's Decisions taken by the Izmir Greater Area Municipality's Real Estate Appraisal Unit. The "objective value increment" has regulated by the Confiscation Law (Law No. 2942) in article 11-f under the subheading of the "Agricultural Land Immobile Property's Value Appraisal".

to property owners in the sending areas and how many TDRs a developer needs to build an additional dwelling unit or amount of commercial space in a TDR receiving area is very crucial. The difference between conservation and conservation-free market values as the equivalent of the development right is derived from the 'density limit' or 'unused growth' to be transferred by equalizing the amount of TDRs elevated from the sending areas and then landing in the receiving area with the appropriate transfer ratio as defined in the statutory planning.

Our findings show that there is a large price difference between adjacent urban and rural land (between *Muratbey* neighborhood and adjacent agricultural land). The conversion of agricultural land for urban development would be facilitated by rising land values in the rural-urban outskirts. The first ring of the agricultural land value differential is 0,25 whereas the second ring is 6,2. Similarly, the difference between urban areas is 1/16 (3rd ring) and the most remote ring (more than 1,5 km) is 1/21. These ratios illustrate the high danger of agricultural land conversion, starting with the close proximity (1st ring) and ending with the far one (4rd ring).

Land maintenance is essential for continued rural production, and past and future environmental concerns must be addressed on a regular basis by rural landowners and rural communities to ensure agricultural production's viability. If the findings discrepancies are not addressed in the urban growth strategy in land use planning, the conservation of agricultural land and the long-term viability of food production would be threatened severly. A new approach in which the mobilization of actors using TDR as a resource and indispensable planning tool should be included in the decision-making and management process in safeguarding agricultural production and valuable soil for production, rather than difficulties or victimization due to protection.

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