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REALLOCATION OF AGRICULTURAL LANDS THROUGH LAND CONSOLIDATION; A CASE STUDY OF GEVREKLI (TURKEY)

The decline of the agricultural resources as a result of population growth, the pollution of natural resources, ensuring reliable food supply, and protection of natural and ecological balance are the most vital issues of today and tomorrow. Transition to agricultural mechanization and improvement of agricultural land is necessary for efficient and economical agricultural production. Land consolidation projects are widely used for the reorganization of agricultural land. In-field development services for increasing agricultural production relate to the shape and dimensions of the agricultural lands that form the basis of agricultural activities. In this study, the Gevrekli (Konya - Turkey) consolidation project was examined. The number of parcels, average parcel size, and number of shares per parcel were compared before and after the consolidation. From the obtained data, the effects of the consolidation project on the structural condition of agricultural parcels were examined. These values were interpreted according to the results obtained.

➤ **Keywords:** Agricultural land, land use, land consolidation.

Introduction

In recent years, the rate of increase in the world population that has reached unimaginable proportions, and the problems as a consequence of excessive use of natural resources by people have brought about unforeseeable consequences, and sometimes even disasters [3]. Recently, targeted governmental environmental programs have been established to support ecosystem restoration, sustainable land management and livelihood improvement [6]. In Turkey, 8,5 million ha (out of an arable area of 28,5 million ha) can be irrigated economically, but, at present, only 4,8 million ha are being irrigated. The average farm size was 10 ha in 1950, 6,8 ha in 1980, 5,9 ha in 1990, and 6,1 ha in 2001; the numbers of farms in the same years were 2,2 million, 3,5 million, 3,9 million, and 3,02 million, respectively [2; 5]. One of the major problems of agriculture in Turkey is the bad business structure. Agricultural land in Turkey is small, fragmented and scattered, which causes a failure in proper exploitation of irrigation and transportation networks, renders irrigation management hard and makes it difficult to obtain the expected benefits from water and land resources [1].

Land consolidation

To prevent the aforementioned problems, legal and juridical arrangements are made in order to prevent more fragmentation and alteration, and also to heal already existing decrements, fragmentation and disorder. A project which rearranges agricultural lands is called land consolidation [8]. Land consolidation is defined in two ways. In a narrow sense, land consolidation is the process of "consolidating fragmented properties without any infrastructural work". In a broader sense, consolidation includes "consolidation of fragmented properties, as well as all infrastructure services that need irrigation, drainage, transport, soil-water conservation measures and rural settlement" [4]. Land consolidation is a tool for improving the effectiveness of land cultivation and for supporting rural development [7].

Land consolidation is defined in Article 20 of Law 3083 as "intending to consolidate agricultural lands that have been so fragmented as not to allow economic production and, when needed as far as possible, by expanding them; and to prevent farming lands from getting fragmented and decreased in size so that it will not be adequate enough for families to get their livelihoods and make use of family workforce" [9]. Therefore, land consolidation aims not only to consolidate lands but also to reorganize the country.

Application

Material and Method

The research area is the neighborhood of Gevrekli in the Seydişehir district of the Konya province (Turkey). The project site is located between 37°31'50" – 37°35'33" N latitudes and 31°50'30" - 31°54'30" E (WGS84 datum) longitudes (Figure 1). It is a project that involves 2292 landholders containing 8249 parcels (plots) covering an area of 16290 da.

The project was implemented by Konya Regional Directorate of Agriculture Reform between 2009–2011. According to the 2010 census, the population of the village is 1868. The main source of livelihood for the local people is agriculture and animal husbandry. Distance to the district center is 14 km, and distance to Konya provincial center is 77 km.

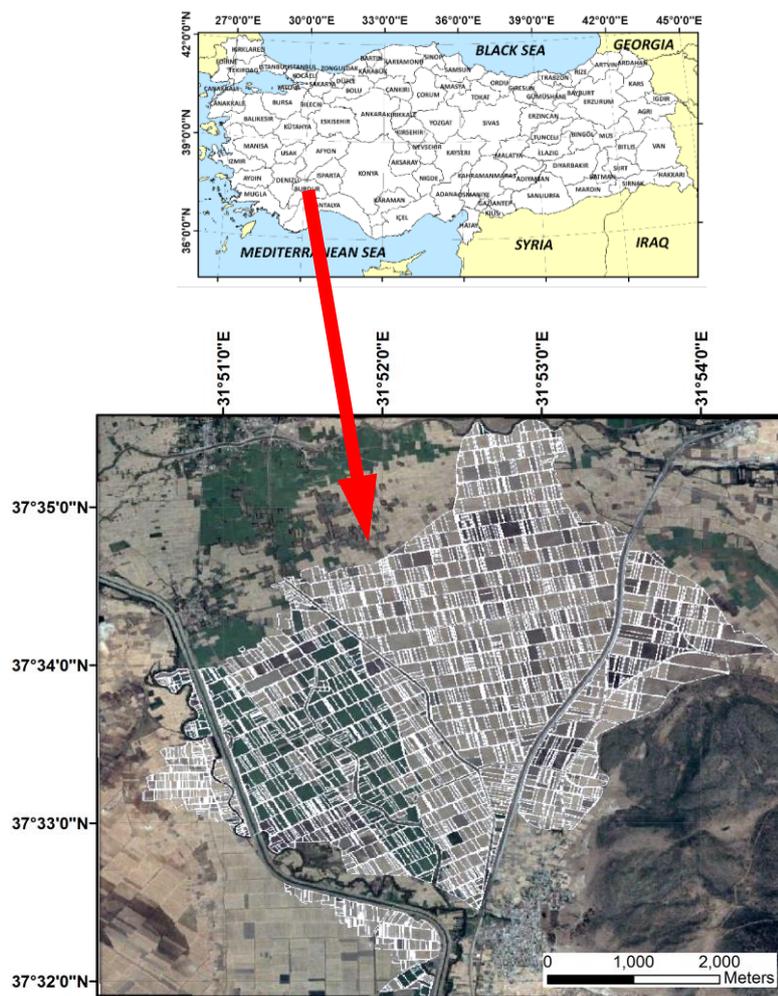


Figure 1 – Project area (Google Earth 2017)

Findings and Discussion

All of the existing lands belonging to the persons on the project site are agricultural land. The size of the agricultural enterprises that farmers have established is not in the size and quality to provide employment. The following results were obtained with the land consolidation project implemented for this purpose (Table 1).

In the new state of the Gevrekli consolidation project, 185 blocks were created (Figure 2). Minimum Block Parcel Area is 1364,43 m², Maximum Block Parcel Area is 274213.05 m², and Average Block Parcel Area is 82386,59 m². In the parceling plan, some of the shapes of the blocks are distorted to ensure that the traffic routes of the fields are connected to the village center and the existing stabilized roads are maintained. Common areas such as road, irrigation and drainage systems are also in use at 88,1ha, with a 5,47 % cut from the relevant shares of the project site owners.

In the Gevrekli consolidation project, the number of pre-project parcels are 8268 whereas the number of parcels after the project are 3637 (Figure 3). The average parcel area are 1,95da before the project but 4,21da in the new case. There were 10112 shares in the 8268 cadastral parcels before the project. This indicates a fragmented and disorganized share structure. The number of parcels per business is 3,6 before consolidation and 1,1 after consolidation. According to this, each business is given a single piece of land in the new situation in return for their old lands.

While the shapes of the pre-consolidation plots were complex and irregular, the new plots were appropriately and geometrically shaped after the project (Figure 4). Also, in the new case, there are no parcels that

do not face the road. After the consolidation, all the parcels benefit from the irrigation system. Digital land registry records and cadastral status of the entire project area were created in the computer environment.

Table 1 – Gevrekli land consolidation project in brief

Nature	Value	Unit
Project area	16122	da
Number of parcels before the project	8268	Item
Number of shares before the project	10112	Item
Total parcel area before the project	16122	da
Average parcel size before the project	1950	m ²
Total number of blocks	185	Item
Total area of blocks	15241	da
Area for common use	881	da
Number of new parcels in the new case	3617	Item
Average parcel size in the new case	4214	m ²
Total border length in the old case	1550942	m
Total border length in the new case	870123	m

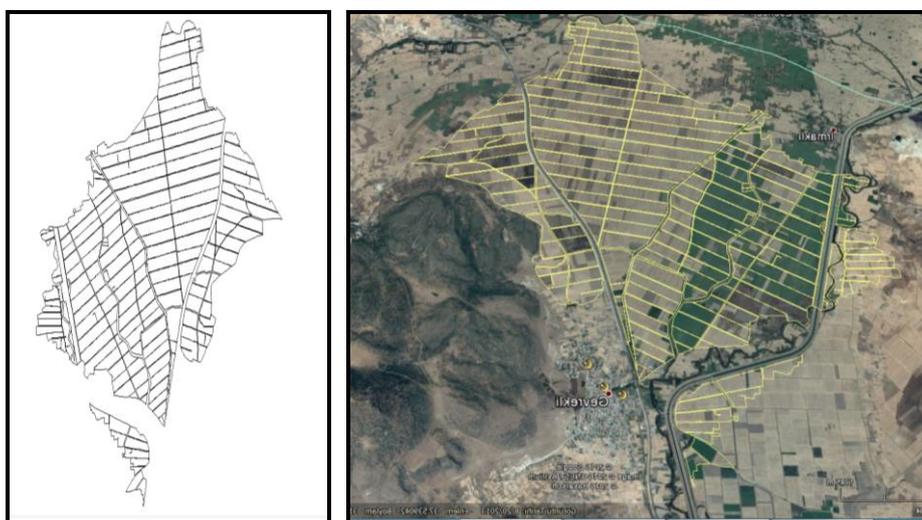


Figure 2 – Block planning of project area (Google Earth 2017)

While the total border length was 1550942m in the old case, it is 870123m in the new case. Consequently, the decrease in the total border length is 680819m. Given the margin of approach to the border is 50cm in cultivating land during agricultural activities, the total net land use has increased by 34ha.

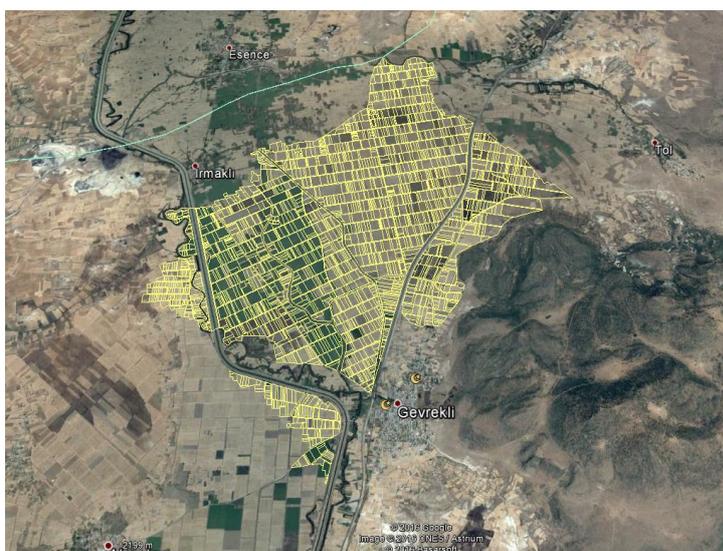


Figure 3 – Post-project cadastral situation (Google Earth 2017)

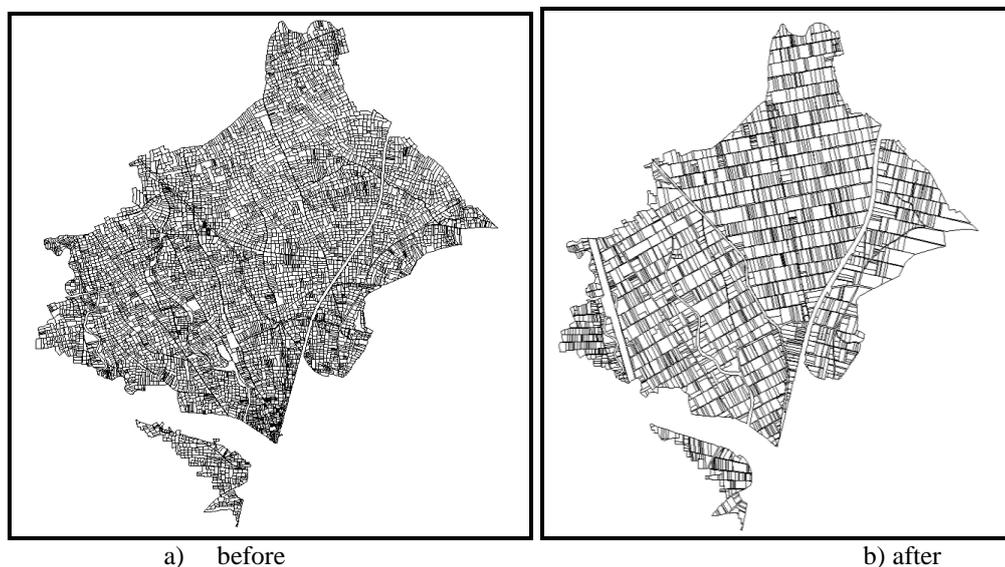


Figure 4 – Cadastral situation before and after the project

Conclusion and suggestions

The shape and dimensions of agricultural land are crucial in order to increase productivity in agricultural production and to implement economic and mechanized agriculture. Agricultural land is being fragmented for various reasons, especially due to the provisions of the inheritance law, irrigation, road, and railway projects. As a result of this fragmentation, the average parcel sizes decrease and parcels distorted in terms of shape emerge. Land consolidation plays a key role in solving these problems.

With the application of land consolidation projects, the number of parcels is decreasing. Thus, farmers are carrying out agricultural activities on a single piece of land rather than farming 5–6 pieces of land. As a result, the distance covered to go to one's land is reduced and time and fuel savings are ensured. Parcel size and net land use increase, and agricultural mechanization become easier. Joint ownership and the number of shares are decreasing, and share problems among village residents are disappearing. As a result, social peace is provided among the people living in the village. There are no parcels that do not have a road front or that do not benefit from the irrigation system. Since labor and time savings are provided, economical and efficient production is being made. Consolidation projects make it easier to implement environmental and natural conservation projects.

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**ПЕРЕРАСПРЕДЕЛЕНИЕ СЕЛЬСКОХОЗЯЙСТВЕННЫХ ЗЕМЕЛЬ ПУТЕМ ИХ
КОНСОЛИДАЦИИ: ИЗУЧЕНИЕ СЛУЧАЯ ГЕВРЕКЛИ**

Сокращение сельскохозяйственных ресурсов в результате роста численности населения, загрязнение окружающей среды, обеспечение безопасности продуктов питания и защита природного и экологического баланса – особо важные и актуальные проблемы для современного общества. Переход к сельскохозяйственной механизации и улучшение сельскохозяйственных земель необходимо для эффективного и экономически рентабельного сельскохозяйственного производства. С целью реорганизации сельскохозяйственных земель широко распространена практика реализации различных проектов по их консолидации. Разработка земель с целью увеличения сельскохозяйственного производства связана с характеристиками сельскохозяйственных угодий, формирующих основу для сельскохозяйственной деятельности. В настоящем исследовании изучается опыт реализации проекта по консолидации Геврекли (Конья – Турция). По итогам исследования было определено влияние консолидации на структурное состояние сельскохозяйственных участков, а полученные результаты были интерпретированы в отношении вышеуказанных факторов.