

## **The Effect of Land Consolidation Components on Parcellation Plans**

**Turgut AYTEN and Tayfun CAY, Turkey**

**Key words:** rural development, land Consolidation, interview, parcellation

### **SUMMARY**

Rural development is one of the key themes that occupy the agenda of Turkey. Land consolidation operations are also important components of rural development. Ownership structure in Turkey is dispersed, fragmented and insufficient size to perform economical agriculture. Present lands should be reconsolidated and modern agriculture should be applied in order to increase the diversity of agricultural products and their profit.

There are many steps in land consolidation work. One of them – may be the most important- is to make new parcels towards the interviews of land owners. In this paper the factors that effects making new parcels in land consolidation area will be investigated. In this context, components of land consolidation that effect the parcellation e.g. the institutions and organizations responsible for the control of land consolidation work, contractors that make land consolidation and land owners whose lands are to be consolidated.

## **Arazi Toplulařtırma Bileřenlerinin Yeni Parselasyon Planlarına Etkileri**

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**Anahtar sözcükler:** Kırsal gelişim, Arazi Toplulařtırma, Mülakat, parselasyon

### **ÖZET**

Kırsal kalkınma Türkiye'nin gündemini meşgul eden en önemli konu başlıklarından biridir. Arazi toplulařtırma işlemleri de kırsal kalkınmanın önemli unsurlarındandır. Türkiye'nin mülkiyet yapısı dağınık, parçalı ve ekonomik tarım yapmaya elverişli olmayan büyüklüktedir. Tarım ürünlerinin çeşitliliğini ve girdilerini artırmak için mevcut arazilerin ivedilikle toplulařtırmaya tabi tutulup arazilerin birleřtirilip modern tarıma geçilmesi gerekmektedir.

Arazi toplulařtırma işlemlerinin birçok safhası vardır. Bu safhalardan bir tanesi belki de en önemlisi tarla sahibi işletmelerin mülakatları doğrultusunda yeni parsellerin oluşturulması işlemidir. Bu bildiride, arazi toplulařtırma sahasında yeni parsellerin oluşturulmasında etki eden faktörler incelenecektir. Bu kapsamda, Arazi toplulařtırma bileřenlerinden parselasyona etki eden; Arazi toplulařtırma işlerini yaptırıp kontrol etmekten sorumlu kurum ve kuruluşların, arazi toplulařtırma yapan müteahhitlerin ve toplulařtırmaya tabi tutulan parsel sahiplerinin etkileri incelenecektir.

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## 1. INTRODUCTION

Land consolidation operations must be carried out to increase product diversity of agricultural sector, which tries to produce in too fragmented and small areas in rural regions of Turkey, to modernize working conditions and agricultural mechanization, and therefore to make contributions in rural development. Being able to accomplish land consolidation projects in a short span of time depends upon in a short time and accurately obtaining data that is needed in planning step and their interpretation (Koseoglu and Gundogdu, 2004). The notion of “rural development” came into being at the beginning of 19. Century and after some alterations it reached our time as parallel with developments in international area. In Turkey, rural areas generally refer to dwelling units, where population rates are low, economical life is based on agriculture, natural conditions and traditional values have an enormous impact on the development of life, and where the social means such as education, health and correspondence are not developed sufficiently. Rural areas also refer to places, which have strong connections with urban population and provide recreational services to them (Gulcubuk, 2005).

Although rural development is defined as “all sort of activity to facilitate rural life”, in Turkey it is understood as bringing infrastructure services to rural areas and developing agricultural landholdings. In order to provide infrastructural services at least at a minimum level and to utilize from insufficient public funding at maximum level; Village Institutes in 1950-60, Urban Villages and Urban Agriculture in 1970s, and Center in 1980s were seen as solution means (Can, 2007). For rural development, which handles development efforts in a spatial dimension and usually establish close ties between agricultural development and itself, a comprehensive description is needed taking into consideration its multifaceted nature. In this context, rural development is to raise living standards, to increase the level of income and welfare in disadvantaged life and working places that are out of urban areas through evaluating the feasibility and sustainability. It is to lift development differences between these regions, to improve agricultural structure and to raise the quality in agricultural production. It is to establish processing industry in each scale and at least to integrate agricultural production with industry. In addition to agricultural development, with the aims of food safety, reducing unemployment, prevention of an unhealthy migration, etc., it refers to determining needs and priorities in available structures in social, cultural and economical fields such as agricultural infrastructure, education, health, social security, organization, sheltering, transportation, correspondence, employment, marketing, rural tourism, local handicrafts, etc.. Briefly, it refers to all improving activities needed for elimination-improving of inadequacies in specified matters (Anonim, 2002).

Land consolidation operation is an operation, which is the rearrangement of ownership in land and land registration, to combine fragmented for different reasons, different-sized and two or more parcels of landowners in different places in blocks that are designed to have road and water connection taking into consider the parcel indexes and giving optimum sized parcels taking into consideration also interviews of landholdings to get better yield in rural areas.

In land consolidation operations, the following actions are taken: The announcement of consolidation area and putting an annotation onto the title deed, the determination of the current situation of the project site, doing survey on ownership and soil, the planning of road and irrigation-drainage, constituting the blocks, the determination of stationary plants, finding the share of common plants, having interviews for new pieces with landholdings, the rearrangement of new parcels after rating of interviews, posting new parcellation plan, receiving and evaluating petitions of objection, having related constitutions approve parcellation plan, commit of new parcels to landholdings, and registration of land after cadastral controls. (Kara 1980, Banger and Sisman 2001, Cay 2013).

The most important and fundamental part of land consolidation projects consists of creating new parcels and planning step. The accuracy of that planning depends on the accuracy of data. The data, which are obtained accurately in a short span of time, will help project designing and application steps to be done faster and more accurately. With this operations, data can be obtained, which can be used during and after consolidation. Mappings in land consolidation projects are done with the help of classic and orthophoto methods.

The effect of land consolidation components on parcellation; The effects of institutions and organizations that are in charge of application and control of land consolidation projects, of contractors, who carry out land consolidation and of parcel owners, who are put through land consolidation will be analyzed.

## **2. MATERIAL AND METHODS**

### **2.1 Material**

#### **General Features of Application Area**

Kocarlı County of Aydın Province has been taken as application area for land consolidation and farm development (Figure 1). The aim of choosing this area is that land consolidation projects of these villages have been completed. Therefore, this factor has been actively involved in studies in this field and resolving the problems. All the information and documents of the area is available. There are 14 villages adjacently in the application area. The total area is 14.000 hectares. The control of the application area has been done by officials working in the unit of Aydın of General Directorate of Agrarian Reform.

#### **Planning of Blocks**

Blocks are large, independent pieces of land, which are between roads and channels. As a result of planning the road and irrigation-drying network, block plan will be completed. While block planning is being done, some criteria are taken into consideration, such as transportation condition, irrigation projects, government's big investments, topography of land, etc. After block planning; farmers' opinions, grade features of parcels, usage status of lands, landholding structure and business conditions are taken into account in preparing parcellation plan. The step of taking the ideas of farmers is called the interview study. By means of interview, wishes of farmers are determined and in new parcellation (reallocation) step these wishes are taken into account.

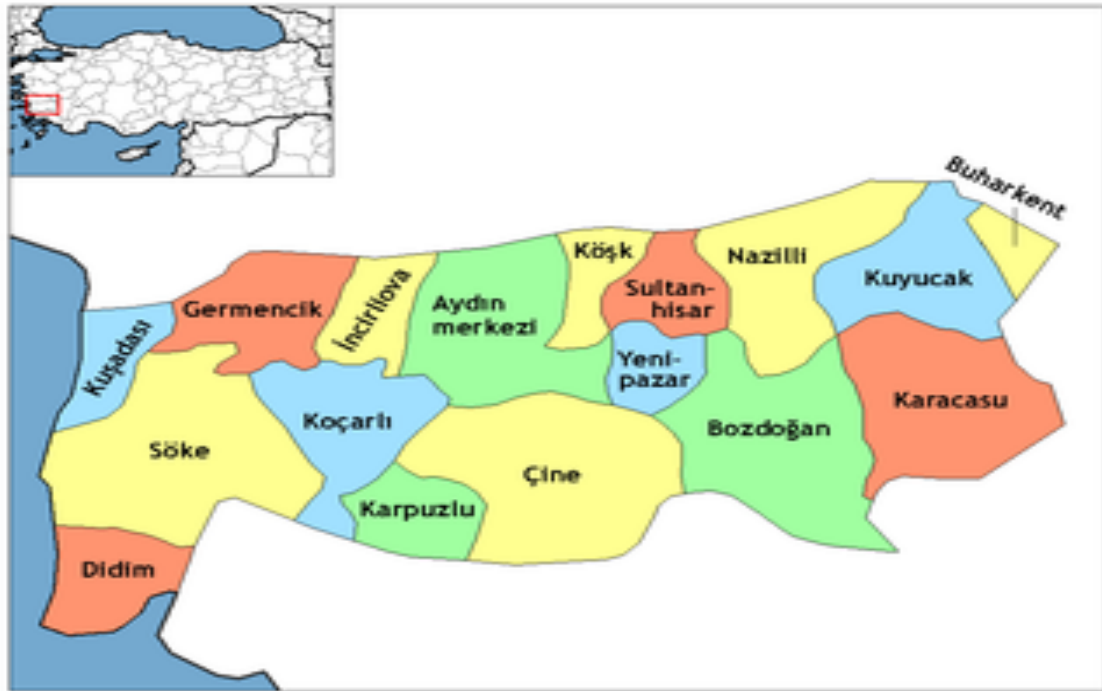


Figure 1. Project Area: Kocaeli County, Aydın

### **Parcellation Plan: determining the shape and dimension of the parcel**

The main goal of land consolidation is to arrange parcels of each landholding in the shape and size, which will provide the most productivity in unit area with the least time, work force and loss of field. The first step in planning of parcellation is determining parcel dimensions. Parcel dimensions refer to parcel size and its geometric shape. The determination of parcel shape and dimensions are related to the aspect ratio of parcel boundaries. By determining the optimum parcel shape, 3 conditions are considered: Agricultural activities must be done the most easily in a short time. The area losses (boundary) that could not be processed must be the least. Road and channel length per unit area must be the least. The parcel shape, which provides operation convenience on parcels and minimizes loss of time, road and channel length per unit, area losses due to boundaries is the rectangle. The optimum parcel shapes vary in general because of landholding's form, degree of landholding mechanization, cultivated plant species and applied farming methods. The optimum parcel dimensions can vary not only from country to country, but also from region to region of a country. The parcel aspect ratios calculated for Western European countries range from 3 to 10. The optimum parcel aspect ratio of land consolidation projects also in Turkey has been found between 3 and 4 (Cagdas, 2012).

### **General Principles in Parcellation Planning**

By planning new parcellation, land is given that is equivalent to the number of parcels in accordance with the indexes of parcel belonging to each person. In parcellation, one should utilize from the information of the previous landholding, ownership and soil surveys, and

wishes of landowners should be taken into account. Each parcel should make use of road and irrigation network. The stationary plants in project area (house, barn, licensed artesian well, greenwood, garden, vineyard, rocky place, swamp) must be given to the previous owners; other parcels must be brought near these. Lands of landowners in the neighbor village, which are in the project area, should be located in blocks as near as possible to their villages. It should also be tried to give landholdings' rented lands, which are engaged in farming in the project area with rental procedures, near to their own lands. New created parcels should be placed in blocks, in such a way that parcels edges are to be perpendicular to road and channels.

## **2.2 Methods**

In land consolidation and farm development project of Kocarlı County of Province Aydın, it has been analyzed how the new parcels are obtain, which factors come into play, who should be or should not be where. If the factors affecting new parcels in this area are listed, it is seen that topography of the land has affected the block planning primarily (because it has a direct effect on irrigation project). There are drainage problems in the area due to the rising ground water in the second place. There are stationary plants in the third place and other investor organizations' projects in the fourth place. In the fifth place there are farmers' wishes, which have had effect on the block formation and consequently on places and dimensions of new parcels.

## **3. RESEARCH RESULTS**

### **3.1 The Effects of the Institutions and Organizations That are in Charge of Application and Control of Land Consolidation Projects on Parcel Dimensions**

In land consolidation projects, blocks are obtained, which will affect new parcels dimensions that are to given to landholdings after creating road and water network. In forming of these blocks, land slope is done considering drainage channels, which are opened in order to resolve drainage problem that occurs in case of a rise of ground water level. For instance, while drainage channels are opened every 984,25 ft at one side of the area, this distance increase to 1.640,42 ft to the end of the area. In this case, because the distances in the beginnings and ends of blocks are not equal or nearly equal, deformities have been observed in aspect ratios of parcels in the blocks. Drainage channels' going according to the slope of the land has hindered the block to be in proper shapes (Figure 2). New parcels that are located in the same blocks have also distorted geometry (Figure 3).

The engineers see that farmers, senior managers and politicians have effect on parcel places and their reallocation in blocks by making special requests, and therefore they change the shapes of parcels and make them located in high-level places rather than in places that they must be in.



Figure 2. Block planning Figure 3. Parcellation planning

### 3.2 Wishes of Landholdings Put Through Land Consolidation Operations and Effect of Stationary Plants on Parcel Sizes

The stationary plants of farmers in land consolidation area affect geometrical shapes and locations of parcels badly. The stationary plants of different farmers that are near to each other cause parcels to be narrow and long edged because of desires to remain in their own places (Figure 4a). This situation also limits the opportunities to make modern agriculture. In case there are two stationary plants in the parcels of a farmer, house in one and well in the other, he does not want these two parcels to be combined (Figure 4b). This situation decrease the consolidation rate of project, and affects the outcomes of land consolidation badly.

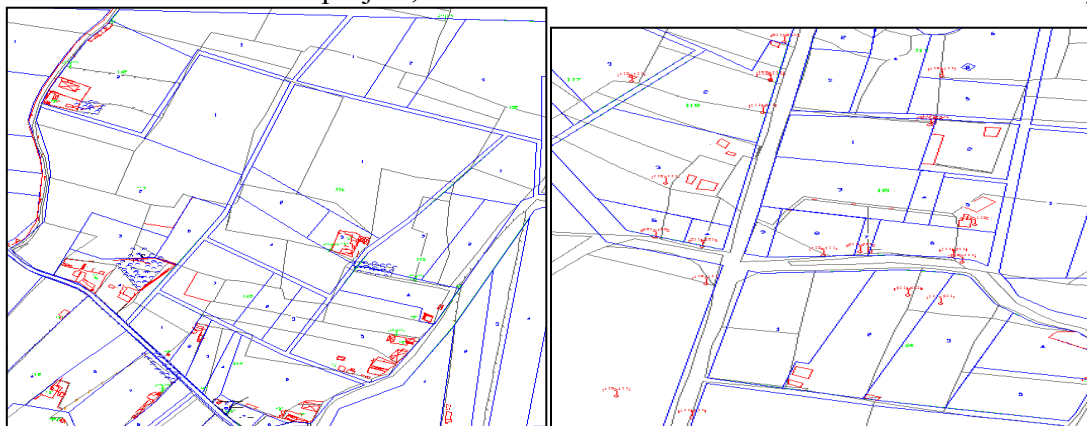


Figure 4a. Stationary plants in project area Figure 4b. Stationary plants in project area

### 3.3 The Effect of Contractor Personnel on Parcel Dimensions, Who Are in Charge of Application and Conducting of Land Consolidation Projects

Recently in Turkey, land consolidation projects that are sine qua non of rural development has been steeped and 1 million lands and hundreds of villages have been put out to tender for land consolidation. The firms that have secured the tender have had to employ personnel other than their existing personnel in order to complete projects in a short span of time. Because there are not enough expert personnel in consolidation field in private sector, the projects had to be

done by inexperienced persons. Because they are not experienced enough to resize the parcels as suitable for agriculture; thin, long, front and rear sides disproportionately different parcellation plans have been done, which will cause losses in agricultural products for many years (Figure 5)

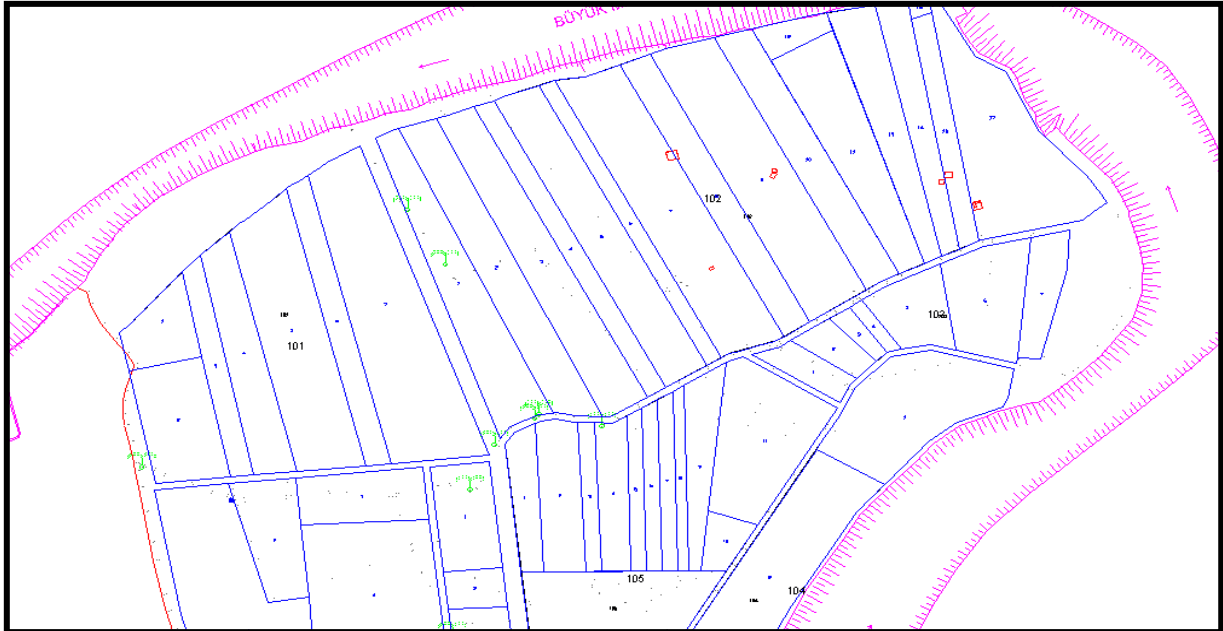


Figure 5. Irregular Parcellation Plans

#### 4. CONCLUSION

The insufficiency of specialized personnel has a bad effect on shapes new parcels. To minimize the damages of this, universities should revise their curriculum in undergraduate and graduate level about land consolidation, and give due consideration to this issue. Besides, by organizing training seminars for employees of private sector, public institutions and organizations in this field; their knowledge should be kept up to date.

The engineers, who control land consolidation projects and provide them to go in order, must not let farmers, senior managers and politicians affect new parcellation plans by making special requests.

Farmers' requests and their will to protect their stationary plants increase the number of parcels and hinder land consolidations, which will respond to needs for many years. This situation cause farmers to be affected badly in terms of time, economy and work force and also gives rise to a second land consolidation project in the following years.

Institutions and organizations, which deal with land consolidation projects, should chose consolidation areas right in order of priority and they should start land consolidation operations, only after eliminating factors badly affecting blocks in these areas.

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