

## LAND CONSOLIDATION IN TURKEY - A MULTIPURPOSE/DISCIPLINE LAND CONSOLIDATION IN TURKEY WITH ICT SUPPORT 2023

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### Abstract

*The goal of the study is to reorganize agricultural business management's owning small, fragmented, and dispersed lands according to modern agricultural business management thus ensures less usage of time, labour force and fund, take advantages of production factors and increase in productivity of agricultural business managements, increase agricultural production, and ameliorate life standards of inhabitants in the rural area. The paper is based on a large literature in the field and information from TVK about land consolidation. The results reflected that Turkey has implemented Land Consolidation activities for 1 million hectares per year to correct the unfavorable situation caused by inheritance traditions and other reasons. In the first years of the program, inheritance regulations were not perfectly organized, so applications encountered issues. In 2014, new regulations were implemented to prevent land division but did not have a beneficial effect on the development of enterprises. To ensure compensation for land value when they move away, Land Banking applications are needed. The Ministry of Food, Agriculture and Livestock developed a GIS based web portal named "TVK" to track and monitor all the activities performed during the management of Land Consolidation Projects. TVK ensures following content to be executed: Contract Management, Project Management and Monitoring, Schedule Planning and Monitoring, Operation Management and Monitoring, Data Management (Textual and Geographical), Estimated Cost Calculation for a LCP by using unit price pool, Progress Payment Management and Monitoring, Final Account Calculation, Interim and Final Acceptance Procedures, Official Letters, Official Reports, Project Statistics, Geographical Data Marking, Correction, Redlining, Mobile applications and E-government integration. TVK has instant and online access to governments Land Registry and Cadastre Information System, Central Population Information System, Address Registration System, Agricultural Information System and Agricultural Parcel Information System. TVK is developed with open-source technologies and compatible with OGC (Open Geospatial Consortium) and ISO standards.*

**Key words:** land consolidation, multipurpose, discipline, TVK, Turkey

### INTRODUCTION

This research study tries to consolidate fragmented lands which are the most important problem of Turkish agriculture.

When the land becomes smaller income obtained from agricultural activities decreases and input expenses decreases when the land becomes larger.

Hence Land Consolidation is indispensable for Turkish Agriculture.

Land Consolidation can be expressed as the process of combining, shaping and reorganization of the fragmented, disintegrated, bad shaped -for various reasons-

parcels for which economically impossible to perform agricultural activities, following the basis of modern agriculture business management and most appropriately performing irrigation [10].

Land consolidation works first started in 1961 in Turkey. Studies were carried out by various general directorates affiliated to the Ministry of Agriculture.

Finally, with the amendment made on 2.7.2018 in the Law No. 6200 on the "Organization and Duties of the General Directorate of State Hydraulic Works", the authority to implement land consolidation was

given to the General Directorate of State Hydraulic Works (DSI).

In the Additional Article 9 of the Law, the purposes of land consolidation practices are given as follows [6]: “Preventing the deterioration and fragmentation of lands by natural and artificial effects, in fragmented lands, combining more than one land plot by considering their natural characteristics, usage

integrity and property rights, creating new parcels that are more functional in terms of economic, ecological and social aspects, and determining the usage patterns of these parcels by evaluating the land characteristics and area. Land consolidation is carried out with the aim of providing village and land development services.”

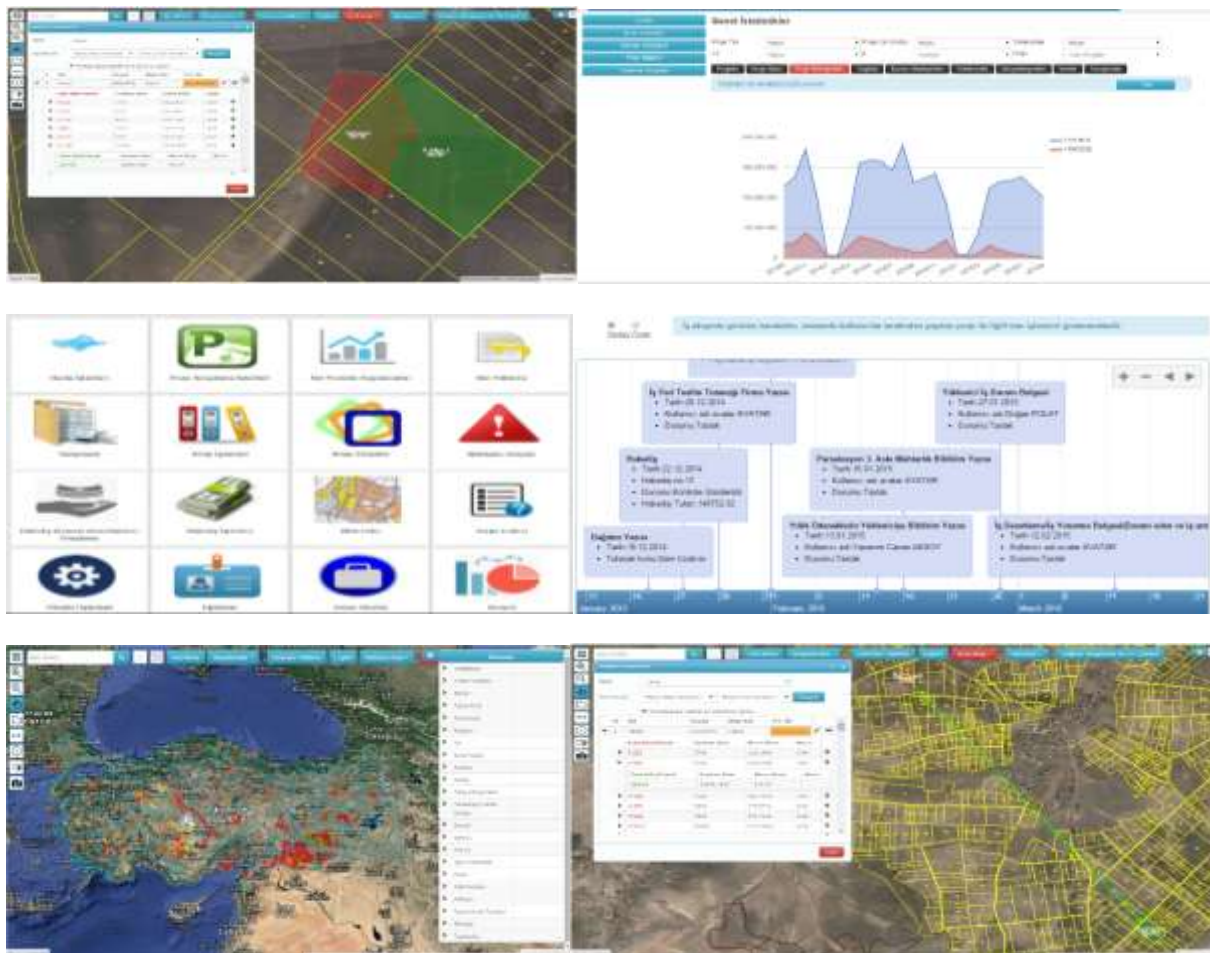


Fig. 1. Snapshots from TVK Land Consolidation ICT Tool  
 Source: Turkish Land Consolidation Database (TVK), 2020 [11].

Land consolidation studies carried out to date.  
 Total Planned Potential Area : 14.3 million Hectares.  
 Completed and ongoing: 8.2 million hectares  
 Not started: 6.1 million hectares  
 Total: 14.3 million hectares  
 Details of Started.  
 Registration completed to date: 3.95 million hectares.  
 Under registration process: 2.55 million hectares

Finished and at the registration phase: 6.5 million hectares.  
 Ongoing area: 1.7 million hectares  
 Total: 8.2 million hectares  
 In this context, the objective of the study is to reorganize agricultural business management's owning small, fragmented, and dispersed lands according to modern agricultural business management thus ensures less usage of time, labour force and fund, take advantages of production factors and increase in productivity of agricultural business

managements, increase agricultural production and ameliorate life standards of inhabitants in the rural area.

## MATERIALS AND METHODS

The research work is based on a large range of information sources regarding the legal background and data from TVK- Turkish Land Consolidation Database, 2020 [11].

The information was logically structured and emphasized the main important results regarding land consolidation in Turkey.

The data were illustrated in suggestive graphics regarding the following indicators: Number of land consolidation projects, Number of consolidated villages, Number of parcels before and after consolidation, amount of landowners before and after consolidation for each year in the period 2010-2014.

## RESULTS AND DISCUSSIONS

### Land problems in Turkey agriculture

By Turkey's inheritance legislation, shares of agricultural land subject to inheritance are fragmented. Sometimes 400 shareholders can occupy only 1 parcel. The average parcel size is around 0.7 hectares, which does not meet the requirements of modern agricultural techniques. In this situation, agriculture is not sustainable in Turkey. Agricultural lands are registered for 40 million individuals while only 3 million is farming [2, 6]. About 37 million people living in the cities cannot use their shares in the parcels in the village. If a person owns a 200-300 m<sup>2</sup> share of a 0.7-hectare land, this person cannot use, rent or sell this area. Because this area is not a size that can be separated from the main parcel and used independently. In this case, this parcel is used by a shareholder living in the village, without the consent of the shareholders, without any legal agreement. This situation negatively affects 3 million farmer families engaged in farming. Because these people are not the owners of the land they use. Although they own some shares in the parcel they use, most of the parcel belongs to other relatives. For this reason, people who farm in the

village and actually use these parcels cannot invest because they do not own all the parcels. They cannot take advantage of credit or subsidy for the land and cannot carry out a project or make an investment.

On the other hand, 37 million landowners, generally living in the city, who have shares in these parcels, cannot use, sell, or rent their land. Therefore, this group is also adversely affected by this situation.

In addition, most of the existing parcels cannot legally benefit from the existing irrigation and road network. Most of the existing parcels do not have a suitable geometry in terms of agricultural mechanization. In Turkey due to inheritance and other factors, agricultural business managements holding lands decreases day by day. In 1950 there was 2.2 million business management and average business management size was 10hectare but in 2000 despite business management increased to 3.02 million, average business management size is decreased to 6.1 hectare (Table 1). [10, 7] When business management scale decreases number of fractions increases. Today there is an average of 7 fraction of land per business management.

Cultivable agricultural land area is 23 million hectare however economically irrigable land area is 8.5 million hectares in Turkey [5, 12].

According to studies performed using satellite data and latest calculation technologies in Turkey land that can be consolidated is calculated as 14-million-hectare area, constituted by 8.5 million hectares irrigated and 5.5-million-hectare dryland [8].

In irrigation network, the one of the most important causes of lowness of the irrigation rates and irrigation efficiency is irrigation projects are constructed without considering land consolidation and internal farm development services.

Today, average there are 600 - 1,000 parcels, 1,500 - 2,000 owners (people who own the land), 6,000 - 8,000 shares in a village in Turkey. On the other hand, the number of families engaged in farming in the village is around 15-20. In short, parcels are very shareable. Most of the owners of the lands in the villages live in the cities.

Two different groups emerge here.

The first of these is those who own land but cannot use their land and live outside the village.

When consolidation comes to a village, the owners in this group generally want their lands to be separated from other shareholders and become an independent parcel to save their unused lands from their relatives.

It is not possible to implement these requests. Because if these demands are fulfilled, hundreds of small new parcels will be created in that village.

The second group is the group that cultivates the land.

15-20 farmer families who cultivate the land are also victims. Because this group that cultivates the land knows that not all the lands, they cultivate are theirs, and therefore cannot invest in their land, cannot get loans because they cannot mortgage the land, and therefore cannot use the land properly or make investments.

On the other hand, this group also wants the parcels to remain as they are, without the shares being separated. Because if the shareholder who does not use the land allocates their own shares and becomes an independent parcel, then they can rent or sell these parcels to others.

Therefore, land consolidation is blocked in Turkey today. This dilemma needs to be eliminated as soon as possible. In practice, all parcels are left in place and consolidation cannot be applied. For this reason, there are objections to too much aggregation. Due to these objections, consolidation practices are currently being criticized a lot. Objections cannot be resolved.

In previous years, since the parcels were in the name of the next lineage, there was no such fragmentation and consolidation practices could be done much more successfully.

Especially since agricultural supports were not given to the parcels that were not transferred, the transfers accelerated in Turkey and the multi-shareness and fragmentation accelerated accordingly.

This situation began to hinder the success of land consolidation. It started to show itself

after 2008, when land consolidation under the existing structure was not successful. However, this negativity could not be avoided as there is no legal basis for the land banking system or similar applications. In 2014, the inheritance law was revised, and the legal base of the land banking system was created. Today, the fact that land banking applications are not carried out together with land consolidation applications reduces the success of the applications and increases the objections.

Observations made in the field necessitate that land consolidation studies be carried out together with land banking practices in order to increase the effectiveness of land consolidation projects. However, land banking applications are not yet widely implemented.

TVK Land Consolidation Data Per Year is presented below as follows: Number of land consolidation projects (Figure 2); Number of consolidated villages (Figure 3); Count of parcels before and after consolidation (Figure 4); Number of owners before and after consolidation (Figure 5).

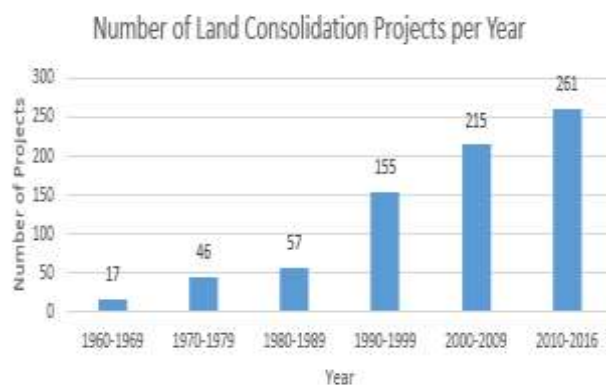


Fig. 2. Number of land consolidation projects/year  
Source: TVK, 2020 [11].



Fig. 3. Number of consolidated villages/year  
Source: TVK, 2020 [11].





Fig. 4. Number of parcels before and after consolidation/year  
 Source: TVK, 2020 [11].



Fig. 5. Number of land owners before and after consolidation/year  
 Source: TVK, 2020 [11].

### Works related to creating the corporate structure of land banking and attracting lands to production

The establishment and development of an institutional structure is of great importance to effectively carry out activities such as solving the property problems that cannot be solved by land consolidation, enlarging the scale of the enterprise, arranging land purchase-sale services, preventing land speculation, developing production models such as tenancy and sharecropping, and bringing idle lands into production is important. Such an institutional structure is needed more than ever for a strong agricultural sector [5].

The term land banking is widely used in developed countries. Although the term land banking in our country can be perceived as a commercial bank in which monetary transactions are carried out, it actually refers to the institutional structure in which land

acquisition works and transactions such as the development, purchase-sale, rental of agricultural lands, determination of land prices and rental prices are carried out.

### Legislation on land banking

In order to solve structural problems in agriculture in Turkey, land banking was discussed for the first time in the 2004 "Agricultural Council" and the most important tasks of land banking, "Acceleration of consolidation works" and "Optimizing business scales" were explained as the council decision [4].

The legislation of Land Banking is constituted by Article 8/A-K of the Law No. 5403 on Soil Conservation and Land Use. According to the express provision of the law; "Ministry; takes necessary measures to increase the size of agricultural land with sufficient income. Moreover, Determination of the value of agricultural lands, obtaining loans, arranging sharecropping, splitting, tenancy works, determining rental prices and directing them to production, creating supply and demand lists, acting as direct intermediary in the agreements of buyers, sellers and tenants, cooperating with relevant public administrations on policies to be carried out in this field. It carries out or has it done, such as providing technical support for credit transactions. » is called.

The need to produce more for the increasing demands of the increasing population and industry in our country in recent years has prompted the governments to determine the agricultural lands that have been idle for various reasons and to bring them into production, and it has been among the important issues of government programs [3].

In this context:

- In the Average Term Program (MTP) published in the Official Gazette dated 27.09.2017 and covering the 2018-2020 period, "Idle agricultural lands will be brought into production with models such as land banking." expression,
- Measure 280 published in the Official Gazette dated 28.10.2017: "Models will be developed for bringing the idle agricultural lands into production and for the efficient

operation of agricultural enterprises." expression,

- In the "New Economic Program (Balancement-Discipline-Change) 2019-2021 MTP, which was published in the Official Gazette dated September 20, 2018 (Presidential Decision No. 108), the necessary institutional and legal infrastructure will be established to bring the idle agricultural lands into agricultural production." and,

- Measure 309 included in the "2019 Presidential Annual Program" in the Official Gazette dated 27.10.2018 (Presidential Decision No 256) states, "Land acquisition practices for bringing idle agricultural lands into production and efficient operation of agricultural enterprises and accordingly Land Banking will be developed." Statements are included.

The "Regulation on Land Acquisition Business and Transactions", which is planned to be implemented in the execution of land acquisition works and transactions, was published in the Official Gazette dated 13 April 2018 and entered into force.

The purpose of the regulation is to ensure that the works and transactions related to the agricultural lands subject to the acquisition of agricultural land are carried out in an orderly manner. In the regulation, the procedures and principles regarding the lands subject to land acquisition in consolidation project areas and other areas have been determined. For this purpose;

1. Identifying (idle) agricultural lands that are not processed and not used in agricultural production due to reasons such as shareholding, fragmentation, property conflict, termination of agricultural activities and migration, and directing them to production in the form of leasing, sharecropping or half-farming,

2. Gathering the necessary information and documents about the lands subject to sale, creating the lists, matching the buyers and sellers, posting the lists on the Ministry's corporate website and on site, and appraising the land prices upon request,

3. Creating lists of the parties related to the lands subject to lease, matching the lists, determining the rental prices upon request,

4. Implementation of transactions in order of priority, if any,

5. Evaluation of possible complaints and objections,

6. Providing technical support by the Ministry in the loan transactions of those who want to use loans other than equity in land acquisition,

7. The works and procedures related to making a request to the Ministry of Finance and carrying out the necessary procedures for the expropriation of agricultural lands that cannot be shared, whose transfer transactions cannot be resolved, and which are not approved for sale and lease, in order to be evaluated in accordance with the Law and production purposes, have been determined [1].

However, the fact that the law no. 5403 is based on voluntariness in land acquisition works and transactions, and the absence of sanctions and incentives has led to the failure to achieve the expected developments in land banking practices. More importantly, the fact that the Ministry could not take a decision on filing a lawsuit in the solution of property problems caused the implementations not to be started. However, in the purchase, sale and lease of agricultural lands, the Ministry has been given very important duties such as intermediary and directing.

Despite everything, no application has been made regarding land acquisition (land banking) until today. Since there is no application, we do not have detailed information about the application.

#### **Efficient solutions**

There are two methods to prevent fertile soil loss due to land fragmentation. First method is Land Consolidation Legislatives [10, 8] for the current fragmented lands to be consolidated. The second one is Inheritance Legislations [3] to prevent future potential fragmentations.

The first one encounters agricultural land selling processes as well. We first constructed our legal basis and then started to implement it with a deterministic approach.

Table 1. Count of business management versus average cultivable area

Year	COUNTOUNT OF BUSINESS MANAGEMENT (MILLION)	Average Cultivable Area (decare)
1950	2.2	100
2000	3.02	61

Source: Turkish Land Consolidation Database (TVK), 2020.

To manage, track and monitor land consolidation activities, Turkey created its own land consolidation database and a GIS based ICT Tool named TVK (Fig. 1) has been developed.

By means of this tool, Land Consolidation projects of the whole country is managed centrally, and GIS data topology is controlled prior to be stored in the database. TVK ensures management of the following features; Contract Management, Project Management and Monitoring, Schedule Planning and Monitoring, Operation Management and Monitoring, Data Management (Textual and Geographical), Estimated Cost Calculation for a Land Consolidation Project by using unit price pool, Progress Payment Management and Monitoring, Final Account Calculation, Interim and Final Acceptance Procedures, Official Letters, Official Reports, Project Statistics, Mapping, Geographical Data Marking, Correction, Comparison, Redlining, Mobile applications, E-government integration. TVK has instant and online access to governments Land Registry and Cadastre Information System, Central Population Information System, Address Registration System, Agricultural Information System and Agricultural Parcel Information System. It is developed with open-source technologies and compatible with OGC (Open Geospatial Consortium) and ISO standards [10]. If anyone has more than one land within the frontier of a single village, they are ensured to be consolidated in one piece as much as possible. We have to go to the business management, make research about the village, explore village parcel structure, their ownership. In the scope of land consolidation, one should determine the problems that can be

resolved for this village. Besides we ask for a report including internal farm development studies as village canalisation status, inner village roads status, parcel size and share distribution, parcel road status, drainage, contour, stone picking, land improvement. All these studies are managed and tracked by TVK-GIS based ICT tool that we have developed [9]. By means of Land Consolidation Legislatives one should obtain less shared and less fragmented land parcels. Thus, investors can easily buy one single piece of land from one seller (Fig. 2).

By means of Inheritance Legislations family business managements will be founded. Some of the inheritors can buy the other inheritors shares and cultivate all of the land by themselves or an investor will agree with inheritors and buy all the shares or government will release it for other investors to buy, else when there is a discordance with inheritors government will make an expropriation and buy the land to sell it for the investors who will make cultivation. Inheritance Legislations prevents the land to be fragmented, from a certain amount of people a business management is obligatory and instead of sharing the land area, the company's shares will be distributed among inheritors. Laws prevents selling of the parcels by fragmentation. When the land yield is less than business management's enough income these parcels cannot be fragmented nor sold. We are currently working on a new ICT tool that will manage inheritance processes. This tool will track land sales and inheritance applications. That will consolidate dispersed lands and meet with investors. This process of legally and physically regulated agricultural lands matching with investors is called Land Banking. In this way if there is a good investor who will seriously make cultivation, transfer by inheritance process immediately turns into a selling process.

## CONCLUSIONS

Land Consolidation activities comprises significant benefits with regards to farmers as well as public investments.

Current fragmented parcels are consolidated, and the potential fragmentation are prevented in Turkey by land consolidation and inheritance legislatives.

In Turkey, legislative regulations and ICT solutions applied for Land Consolidation has become effective and land will be strictly protected, therefore implemented methods can be carried onto international platform to protect the soils in the world toward corrective actions and improving opportunities in global scale.

## ACKNOWLEDGEMENTS

We dedicate this article to our colleague Doç. Dr. Gürsel KÜSEK, who lost his life in a traffic accident, as we write this article.

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