



The Influence of Single Criteria Based Valuation to The Land Evaluation in Land Consolidation Projects

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INTRODUCTION

- In the whole countries, **land consolidation** is applied to improve the rural areas. Because rural areas comprise substantial parts of the regions and are subject to a range of pressures including water shortage, land degradation, failing commodity prices and depopulation. Land consolidation means to unite and reregister the lands, which were divided because of heritage, sales or irrigation canals.
- In Turkey, **14.000.000 hectares** area are proper for consolidation. 8.500,000 hectares of these areas are irrigable.
- There are still 5.000 000 irrigable areas. In Turkey 1.000 000 ha areas are consolidated. **13.,000 000 ha** areas are still waiting for consolidation.

INTRODUCTION

- **The purposes of land consolidation** as given in the 3083 numbered and 22.11.1984 dated law, “Agricultural Reform Law for Land Consolidation in Well-Watered Areas” and “Application Regulations” are as follows:
- Connection of highly fragmented plots according to the principles of modern management
- **Improvement of land and soil**
- Reorganization and improvement of agricultural managements
- **Building roads, drainage and water management systems**
- Leveling and tree planting of mountainous areas
- **Arrangement and reallocation of land and enlargement of managements**
- Arrangement of settlements (electrification etc.), joining of scattered plots, improvement of all aspects of agricultural life in order to obtain highest productivity of land and labor, and taking measures in technical, social, cultural and economic aspects to increase agricultural life

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INTRODUCTION

In Land Consolidation Projects, land evaluation is one of the most important phases. The aim of evaluation is to obtain the land values according to the certain criteria's. Land exchange between different land degrees is only possible with calculation of parcel value number of each parcel.

Land valuation is a core element in any land consolidation process. The objective of land valuation is to facilitate the land consolidation (re-allotment) process through establishing a platform for the formation of the land prices that can be common accepted by the participants.

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INTRODUCTION

- In land consolidation projects, available parcels' land evaluations must be applied with respect to certain criteria in order to give equal land to landowners as before consolidation project.
- In this study, market value index, soil index, productivity of the soil and location index, which affect land evaluation in land consolidation projects, were examined in Kizik village of Karaman Province in Turkey. Additionally, the effects of each index to the land consolidation projects have been investigated in the way of cost, duration and reliability.

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LAND VALUATION METHODS IN LAND CONSOLIDATION

Land Valuation in Accordance with Land Consolidation Regulations

- Parcels that are located in consolidation areas are ranked for computed transformation values. Equation (1) is used to compute Land Index (PE)
- $PE = 0,70 * SI + P + L$ (1)
- Where **SI** is defined soil index and derived from the soil profile, soil structure, and slopes of the land, salinity of the soil, pH, erosion, microroliyef and other soil qualifications and then marked as 100 point. **P** is referred productivity of the soil, and marked as 10 points. Where **L** is the location index of the parcel and marked as 20 points.
- According to this law, agricultural lands are grade 10 degrees. Between 1-7 degree lands are arranged in a one group. Between 8-10 degree lands are not evaluated

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Land Valuation in Accordance with Land Consolidation Regulations

- Unique index value is established depending on the index and areas of the index values which are inside the same degree scale. The ratio of these different degree index values between
- each other gives the **transformation table**. If different degree value apart from the participation degree is determined to the holdings; this table can be used for transformation between degree values
- In application is used number of parcel value (**P**arsel **D**eğer **S**ayısı - **PDS**) instead of transformation value.
- Equation (2) is used to compute number of parcel value
- $$PDS = PE * (Area) / 100 \quad (2)$$

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Land Valuation in Accordance with the Law No. 3083

- Technical instruction arranges land consolidation made independently from land reform. For ranking process of application of land consolidation, all parcels in project areas are marked as related to **market value indexes** and **soil indexes**.
- Market value index is estimated related to the soil productivity, the variety of production, the features of soil, location, the irrigation condition, the distances to the holdings center, the village and the market, size and shape of the parcel and transportation condition.

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Land Valuation in Accordance with the Law No. 3083

- The land index and market value index (MVI) are marked as 100 point. Then, unit value of the parcel (UVP) is computed by the mean values of these indexes. When the parcels that have more than one land index and market value index the UVP is more than one.
- Thus, with computing the weighted mean values of these indexes, a weighted mean value of the parcels (WMNP) is obtained. After the highest WMNP is accepted as first rank, the parcels in application area are ranked. If there are the approximately same WMNPs in application, the mean values of them are obtained and this is called as rank mean point (RMP). By rating of RMPs with themselves, the equivalency of degrees is provided
- **UVP= (Soil Index + Market value index) / 2**

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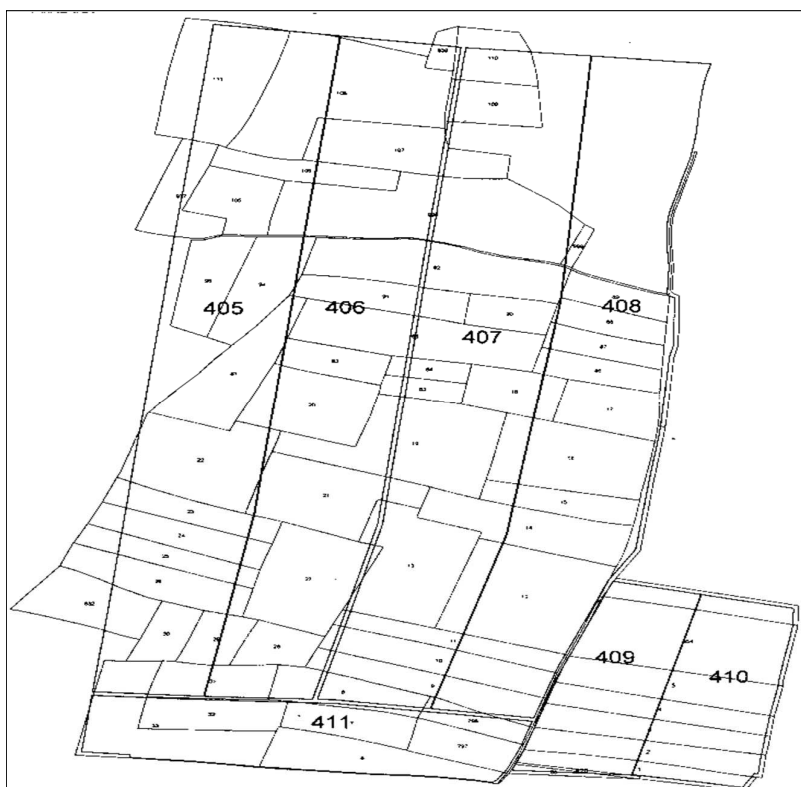
APPLICATION

Introduction of Application Area

Kızık Village is north of Karaman and is 7.4 miles from city centre. The population of the village is 305 and there are 90 houses in it. The economy of the village is based on agriculture and stockbreeding. There is an elementary school. The road, which enables access to village, is tarmac. By means of the land reform in 2011, its impact on agricultural economy increases. The land consolidation applications were started by GDAR in 2013. Total number of parcels is 837. The blocks no. 405, 406, 407, 408, 409, 410 and 411 have been chosen as application area for the analysis of valuation criteria in project site (Figure 1).

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MATERIAL AND METHOD



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Figure 1. Application Area of Karaman Kizik Village

Analysis of Land Valuation Methods in Land Consolidation

The land valuation applications in land consolidation site are made in the form of soil gradation. The parcel areas of the blocks no. 405, 406, 407, 408, 409, 410 and 411 in project area, soil index (SI) , location grades (LG) , location index (L), market values (MV) and market value indexes (MVI) are given in Table 1.

Table 1. Data of Project Area

Number of Parcel	Area(m ²)	SI	LG	L	MV (TL)	MVI
1	19826.64	100	8	80	9	90
2	28265.55	100	8	80	9	90
3	28171.72	100	8	80	9	90
4	26175.91	100	9	90	9	90
5	36037.06	100	9	90	9	90
6	36447.874	98	7	70	5	50
7	21258.465	99	7	70	5	50
8	25390.89	99	7	70	7	70
9	32129.255	99	8	80	10	100
10	34366.918	99	8	80	10	100

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Table 2. Coefficients of Transformation of the Application

Coefficients of transformation of the application, which is carried out in accordance with the law no. 3083 is given in Table 2.

	1° (85)	2° (80)	3° (75)	4° (70)	5° (65)
1° (85)	1.0000	1.0625	1.1333	1.2143	1.3077
2° (80)	0.9412	1.0000	1.0667	1.1429	1.2308
3° (75)	0.8824	0.9375	1.0000	1.0714	1.1538
4° (70)	0.8235	0.8750	0.9333	1.0000	1.0769
5° (65)	0.7647	0.8125	0.8667	0.9286	1.0000

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Table 3. Coefficients of Transformation Prepared According to Soil Index Criteria

Coefficients of transformation prepared according to soil index criteria is given in Table 3. Productivity index has not been taken into account, because it has parallels with soil index.

	1 ^o (100)	2 ^o (99)	3 ^o (98)	4 ^o (87)	5 ^o (87)
1 ^o (100)	1.0000	1.0101	1.0204	1.1494	1.5385
2 ^o (99)	0.9900	1.0000	1.0102	1.1379	1.5231
3 ^o (98)	0.9800	0.9899	1.0000	1.1264	1.5077
4 ^o (87)	0.8700	0.8788	0.8878	1.0000	1.3385
5 ^o (87)	0.6500	0.6566	0.6633	0.7471	1.0000

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Table 4. Coefficients of Transformation Prepared According to Location Index Criteria

Coefficients of transformation prepared according to location index criteria is given in Table 4.

	1 ^o (100)	2 ^o (90)	3 ^o (80)	4 ^o (70)	5 ^o (50)
1 ^o (100)	1.0000	1.1111	1.2500	1.4286	2.0000
2 ^o (90)	0.9000	1.0000	1.1250	1.2857	1.8000
3 ^o (80)	0.8000	0.8889	1.0000	1.1429	1.6000
4 ^o (70)	0.7000	0.7778	0.8750	1.0000	1.4000
5 ^o (50)	0.5000	0.5556	0.6250	0.7143	1.0000

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Table 5. Coefficients of Transformation Prepared According to Market Value Index Criteria

Coefficients of transformation prepared according to **market value index** criteria is given in Table 5.

	1 ^o (100)	2 ^o (90)	3 ^o (70)	4 ^o (60)	5 ^o (50)
1 ^o (100)	1.0000	1.1111	1.4286	1.6667	2.0000
2 ^o (90)	0.9000	1.0000	1.2857	1.5000	1.8000
3 ^o (70)	0.7000	0.7778	1.0000	1.1667	1.4000
4 ^o (60)	0.6000	0.6667	0.8571	1.0000	1.2000
5 ^o (50)	0.5000	0.5556	0.7143	0.8333	1.0000

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Analysis of Land Valuation Methods in Land Consolidation

In the application area, new assigned lands are calculated in Table 6 for 16 parcels chosen from different blocks according to **soil index, location index and market value index**. The influence of valuation methods, which are based on single parameter, on reallocation is seen in this Table. The average of new assigned lands, which is calculated according to single parameter based valuation methods, is seen in Table 7. As 16 parcels' place changing is taken into consider from these average values, it is seen that the nearest parcel number to the average value is 5 parcels according to new evaluation method 3038 (for from 2010 on); 3 parcels according to soil index; 6 parcels according to position index and 3 parcels according to market value index.

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Table 6. New Assigned Lands in Single Parameter Based Valuation

Block/Parcel Number	Area (m ²)	Law no:3083 Degree	SI Degree	L Degree	MVI Degree	New Block	Law no:3083 Derece	SI Degree	L Degree	MVI Degree	Area according to Law no:3083 Degree	Area according to SI Degree	Area according to L Degree	Area according to MVI Degree
410/4	26175.91	3	1	1	2	406	3	3	4	4	26175.91*1=26175.91	26175.91*1.0204=26709.898	26175.91*1.4286=37394.905	26175.91*1.5000=39263.865
408/12	72436.757	3	2	2	1	405	3	3	3	2	72436.757*1=72436.757	72436.757*1.0102=73175.611	72436.757*1.125=81491.352	72436.757*1.1111=80484.481
407/13	57492.43	3	2	3	3	410	2	1	2	2	57492.43*0.9375=53899.153	57492.43*0.9900=56917.505	57492.43*0.8889=51105.021	57492.43*0.7778=44717.612
405/22	56852.42	3	2	5	5	407	2	4	3	3	56852.42*0.9375=53299.143	56852.42*1.1379=64692.368	56852.42*0.6250=35532.763	56852.42*0.7143=40609.684
406/27	52080.46	2	3	4	4	409	2	1	1	2	52080.46*1=52080.46	52080.46*0.9800=51038.85	52080.46*0.7000=36456.322	52080.46*0.6667=34722.042

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Table 7: Comparison of Single Parameter Based Valuation Methods

Number of Parcel	Area according to Law no:3083 Degree	Area according to SI Degree	Area according to L Degree	Area according to MVI Degree	Average M ²
410/4	26175.91	26709.898	37394.905	39263.865	32386.14
408/12	72436.757	73175.611	81491.352	80484.481	76897.05
407/13	53899.153	56917.505	51105.021	44717.612	51659.82
405/22	53299.143	64692.368	35532.763	40609.684	48533.49
406/27	52080.46	51038.85	36456.322	34722.042	43574.42
405/30	15810.239	14821.636	10587.094	14821.636	14010.15
411/32	24034.801	27072.799	12017.4	12017.4	18785.6
406/82	16395.074	17488.079	17488.079	11659.302	15757.63
407/84	8361.544	7918.270	14270.368	12486.572	10759.19
408/88	14523.038	13613.702	15491.241	15491.241	14779.81
407/90	15090.905	13261.887	15090.905	13581.814	14256.38
405/95	25127.979	26803.178	21442.542	24122.86	24374.14

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CONCLUSION

- Different criteria are used in evaluation applications of land consolidation projects. The applicability and accuracy of these criteria have always been a matter of debate. What is important here is that farmers do not undergo loss of any right after evaluation. And this depends upon accurately application of it.
- According to results of the project; as the average areas are taken into account, it is seen that evaluation applications carried out in land consolidation areas (in accordance with the law no. 3083) have values that are near to the results in evaluation applications only according to position index. Besides, it is clearly seen that evaluation applied only according to market value index and soil index do not have such accurate results.

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CONCLUSION

- The accuracy and applicability of evaluation projects could increase, if more decided studies on position based evaluation were carried out and developed. Therefore, the expenditure needed for evaluation process in land consolidation projects drops. Besides that project duration decreases, as well.
- The evaluation projects in Turkey are carried out according to different laws and evaluation criteria (soil index, productivity index, market value index, location index). Because the impact of evaluation difference in land consolidation projects on land reallocation has a negligible extent, new legislative regulations must be authorized.

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