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THE INVESTIGATION OF THE INCOME METHOD ON AGRICULTURAL AREAS IN TURKEY AND A METHOD PROPOSAL

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1. Introduction

Real estate valuation on agricultural lands and urban areas has become valuable since the 1990s when the liberal economy was began to apply in our country.

Since the subject of real estate valuation became a current issue in 2000 in our country “principle confusion” was exist. Because every investigator tried to adapt the principle to our country with little revisions in which country they searched.

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Introduction

The real estate valuation has generally become a current issue in urban areas in our country, but it is neglected in agricultural lands.

The reason is:

- Since there is a rapid immigration from country to city, more lands are needed in cities, so the real estate traffic is more than in country (the rate of urban population was 62% in 2000 whereas it is 70,5% in 2008).
- Customer and seller groups in city are on a vast scale whereas the groups in country are very narrow.
- Freedom and incentive on import in agriculture are very little

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Introduction

Because of the three main reasons, the real estate valuation in agricultural lands has been used on selling the national treasury lands and bank mortgages more than selling between people. But in recent years,

- increase in banking,
- loaning,
- selling the lands of national treasury,
- privatization,
- invest on technology by the big land owners,
- have increased the real estate valuation in agricultural lands.

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2. Real Estate Valuation

The studies in our country examined only in location and aspect of the land.

Location superiorities are expressed orally, but the quality is perceived as production. Location superiorities can be put in a mathematical model. Local rate of interest capitalization must be determined differently for each working area.

On the contrary, the influence of the conjuncture to valuation was neglected.

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2.1. Location Grading

According to habits in our country, local rate of interest capitalization is calculated by division of the annual net income of the land to the selling price. However, the lands in same class and in same productivity may differ in their price. The reason is the superiority of the location to each other.

The location superiorities are called the **location valuation criteria**. The valuation criteria and rates can be reduced or expanded for each agriculture area. Location valuation criteria are graded as below. Grading is given according to the interviews of the farmers of the area and the experiences from the applications.

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2.2. Soil Quality

The amount of the organic element, dampness, soil class, irrigation facility, grade etc. affects the quality of an agricultural land. In this study area, the climate is continental, according to the average of long years it gets rain 300 mm/year. The topography of the area is little hilly. Most part of the area is in 2-3 % grade/slope, it has rarely 4-5 % grade. Alternately agriculture has been applied and after every alternate the land has left unsown (U).

For that reason, in calculation of the annual net income and in **land planting plan** this was taken into the consideration. The part where the grade is 4% or more is a little stony, calcareous and has shallow soil. The general feature of the soil is, light brown-grey colour, poor structured, clayey, loamy, has low organic ingredient. These areas are 2nd -3rd class dry land group. Wheat (W) and barley (B) are planted on these lands.

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Soil Quality

The part where the grade is 1-2% is watered, has medium-high organic ingredient. These areas are 1st -2nd class watered land group. Industrial plants like sugar beet (SB) and sunflower (S), wheat, barley and a few peach and cherry trees are planted on these lands

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2.3. Capitalization Interest

Interest is a cost which is paid to the owner of the capital for the usage of a certain amount of capital in a certain time. Local rate of interest capitalization is the usage right of the capital on land. Farmers are bound to the land, because it is trustable, has minimum risk, can't be carried, can't be increased and giving the owner the favour of monopoly.

Using the Market interest rates on determination of the rate of interest capitalization is acceptable for the developed countries. This rule is not valid in our country where the national income is very low and the population rate is not below 10%.

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Capitalization Interest

In order to calculate the local rate of interest capitalization, there must be a similar land parcels which have the similar features and recently sold like the land where the evaluation will took place.

Since there are very big rates between the actual prices of the lands and the prices at Property Register Management in our country, the prices at Property Register Management are not investigated. In spite of this, some of the trusty villagers who have no excuse to be an expert and the land owners are asked the prices after swearing.

Which data will be collected from which institution is given in Table1.

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Capitalization Interest

Corp prices in our study area are taken from the District Agriculture Management and Agriculture Stock Market. Data of the crop outputs are taken from the District Agriculture Management, land prices are taken from the real estate agencies and National Real Estate Management.

Capitalization Rate Calculation

- **Total Income Calculation (TL/da)**
  - gross income (main crop) = average output (kg/da) x crop price (TL/kg)
  - gross income (secondary crop) = average output (kg/da) x crop price (TL/kg)
  - total gross income = gross income (main crop) + gross income (secondary crop

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Capitalization Interest

- **Net Income Calculation (TL/da)**
  - net income (G) = total gross income - production expenses
- **Capitalization Rate Calculation**
  - capitalization rate (k)= net income(G) / land value(D)

$$k = \frac{G}{D}$$

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Table 1 Collecting Data – Institution Data

Crop selling Prices (TL/kg) - City/ District Agriculture Managements - Land Crop Office - The Chamber of the Agricultural Engineers - The Chamber of the Commerce and Industry - Agriculture Stock Market - Wholesale Food Market Managements - Municipalities	**Crop Output (kg/da)** - City/ District Agriculture Managements - Turkey Statistics Institution - The Chamber of the Agricultural Engineers	**Crop Cost (TL/da) (TL/kg)** - City/District Agriculture Managements - Agriculture Credit Cooperatives
	Land selling prices and dates - Property Register Management (sellings in last a few years) - National Real Estate Management. - Municipalities (Prices for ther eal estate tax) - Real Estate Brokers	**Other Data** - ÜFE -TUİK - Personal studies on local price changes - Other Economic and Money parameters - The results of the former nationalization Studies

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2.4. Conjuncture

Real estate valuation means, evaluation of a real estate according to the market habits by one of the methods suitable to the conditions of time and the region. But conjuncture influences the value of real estate as the location and the soil quality.

Conjuncture expresses the whole actions of the economy of a country like up and down and wavy. In other way, it refers the situation that every condition and position exist.

Conjuncture is every kind of political and economic undulations happened in the world and in our country. It influences the countries very little which have very low inflation and high income (national income 20000 $ and more).

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Conjuncture

On the contrary real estate market was influenced in our country which inflation rate is 10% and national income is 5000 $.

In this case, investment tools go away from the real estate market and stock market, and go to the foreign exchange and gold.

In our country, regression was seen in real estate market.

Since there isn't any change in the conjuncture in Turkey, no conjunctural change has been observed.

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3. Application

For this study, the vacant lots of the state in the İsak village of Konya in Turkey of which selling was the subject to the evaluation by the court was chosen .

İsak village is in the Northeast of Konya which is 210 km far and has 6250 ha and has the population of 650 people. It has continental climate, watered lands and various crop types. The process for evaluation was followed as below. The Study Area Map is seen in Figure 1.

- K1, K2, … comparison parcel
- D1, D2, ..: evaluation parcels

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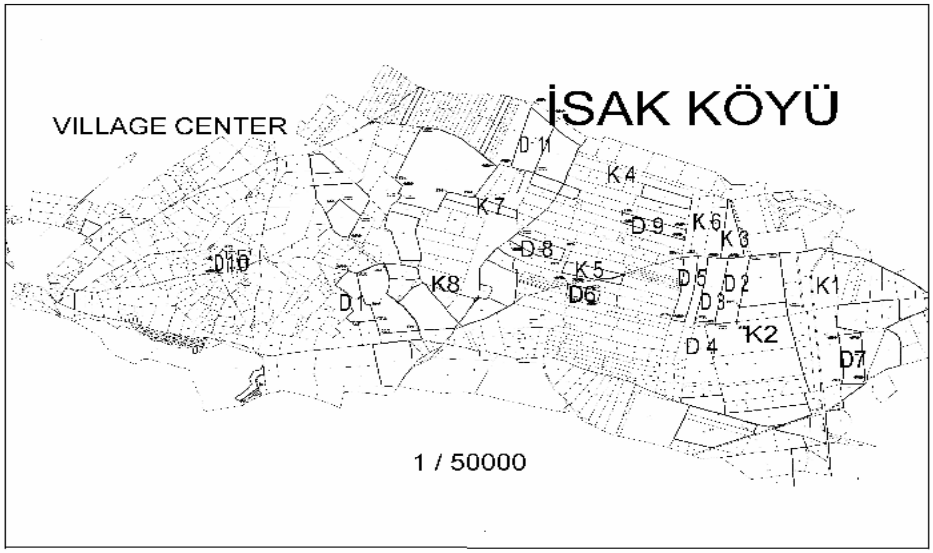
Application



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Application

Location grades and land types of the 11 lands which are to be evaluated was given on Table 8 and 9. The lands of which evaluation will be done later and the land of which **land class** and **location grade** are close to each other were chosen as comparison parcels for the study. It is also seen in the **Evaluation Map**.

The land owners and the villagers under oath expressed the true values in Table 3 Column 7 under consensus. The location grade criteria for the study area were applied as below.

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Application

-The possibility of producing new parcel: Since agriculture is an activity which is done with the contributions of the family members, enough land must be inherited to the members after the death of the owner. The land must have a possibility of parcel production.

Parcelnumber	0	2	5	7	9	11+
Point	-3	1	2	3	4	5

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Application

-The distance from the main road, village centre and petrol station: The distance to the village centre to carry the agricultural equipment to the field, the distance to the main road to reach the market and certain buying centres, the distance from the field to the petrol station for the need of fuel is very important for the farmers. Different grading for the three criteria can be done in this way.

Distance(km)	1	3	5	7	8	9	10	12+
Point	5	4	3	1	0	-1	-2	-3

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Application

- **-The Situation of the Electric Energy:** It is an important criteria for well and some of the agricultural machines working with electricity. The grading can be done in this way.

Situation	Present	Present at Neighbour	Absent
Point	5	2	-2

- **-Facility of Irrigation :** As seen on Table 3 there are nearly two times difference between the dry and watered lands. For that reason existence of the well or canal is an important criterion.

Situation	Present	Present at Neighbour	Absent
Point	8	3	-3

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Application

- **-Grade/Slope:** Keeping the damp of the land is very important for the vegetal production. It is related with the slope besides the soil type.

- **-Soil Class:** The amount of the organic elements in the soil is important for growing plants. For that reason soil clas is important.

Soilclass	1	2	3
Point	8 - 6	5 - 4	2 -0

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Application

- **-Local Crop Variety:** The Crops are various in Isak village because of having dumpy and high quality soil comparing with the other villages around. Sugar beet, sunflower, wheat, barley and rarely potatoes , onion, vegetables and fruit are grown. Grading can be done as below;

State	Many	Few
Point	3	1

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Application

- **-The size and being one piece of the land:** All the lands sold by the state are big enough to support a farmer family (100 da for Konya) and in one piece. Four points are given to one piece lands. Size grading can be done as below;

Area(m^2)	100	200	300	400+
Point	2	3	4	5

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Application

- **-Cadastre:** Cadastre studies of the area are completed, for that reason 1 point is given to all lands.
- **-The Geometry of the Land:** All the lands in the village are in rectangular shape and the number of the corner points are 4 or 5. The angle edges of comparison parcels which were evaluated are nearly 90o with each other. For that reason the loss of land tracking are very little.

Diagonalno	5	8+
Point	3	-3

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Application

-Property Security: There is no life and property danger to obstruct the type of planting the lands, so 1 point is given to all.

In order to valuate the 11 lands which are belong to the National Estate Management, 8 comparison lands which are around was chosen (Figure 1) the rates of location valuation raise are calculated in Table 2 as K1, K2…

Either local experts under oath or the land owners were asked the price of the comparison lands, and their declaration reports are given on Table 3 Column 7.

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Application

Bare values are reached by the correlation below after location increase value rates subtracted from current values of the lands.

YD: Bare value
RB: Current value
Dk: Location Value

$$YD = \frac{RB}{(1 + D_k)}$$

The Arithmetic averages of calculated bare land values are taken according to their state of land class, watered and dry.

Table 2 Location Grades of the Comparison Parcels

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Table 2 Location Grades of the Comparison Parcels

Location Valuation Criteria	K1	K2	K3	K4	K5	K6	K7	K8
The facility of Producing new parcel	5	4	0	0	3	4	2	3
Distance to the main road (km)	5	5	5	-2	5	5	0	3
Distance to the village centre (km)	-4	3	-1	0	-1	1	2	1
Distance to the petrol station (km)	5	4	3	-3	2	-1	-1	2
The state of Electricity	5	5	5	5	2	2	-2	-2
Facility of irrigation	8	8	8	8	3	3	-3	-3
Slope	8	6	3	3	3	3	3	3
Soil class	8	8	5	5	4	4	2	2
Regional crop variety (clover, wheat, barley , sugarbeet, sunflover…)	3	3	3	3	1	3	1	1
One piece land	4	4	4	4	4	4	4	4
Cadastral	1	1	1	1	1	1	1	1
Geometry of the land	3	3	-3	3	3	3	3	3
Land size	4	5	3	4	3	3	3	3
Prop ertysecurity	1	1	1	1	1	1	1	1
Rate of Total Value Increase	**56**	**60**	**37**	**33**	**35**	**36**	**16**	**22**

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Table 3 Bare Value Calculation of Comparison Parcels

SN	Block	Parcel	Area (da)	Land class	Land Plantation Plan	Current Value (RB) TL/da	Locational Value (%) D_k	Bare Value YD= RB/(1+D_k)	Bare Value Average TL/da
K1	226	1	317,9	1. C.watered	SB+SF+W+ B+U	2300	56	1474,36	1502,81
K2	238	86	530,0	1. C. watered	SB+SF+W+ B+U	2450	60	1531,25	
K3	219	67	211,6	2.C . watered	SB+SF+W+ B+U	1700	37	1240,88	1221,95
K4	219	16	284,1	2.C . water	SB+SF+W+ B+U	1600	33	1203,01	
K5	219	27	153,3	2.C .dry	SF+W+B+ U	700	35	518,52	498,23
K6	219	65	240,5	2.C .dry	SF+W+B+ U	650	36	477,94	
K7	216	60	175,3	3.C .dry	W+B+N	450	16	387,93	398,89
K8	216	56	199,8	3.C .dry	W+B+N	500	22	409,84	

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Application

The 11 land belongs to the National Estate Management are 1st class watered, 2nd class watered, 2nd class dry and 3rd class dry lands.

The widespread land planting plans according to the land class is determined in **sak village**. According to these plans, annual net income of the 1st class watered, 2nd class watered, 2nd class dry and 3rd class dry lands are calculated. These are shown in Table 4, Table 5 and Table 6.

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Table 4 Local crops and production grown in the 1st class watered land.

PLANTS	PRODUCTION WATERED (kg/da) (V_y)	NETINCOME RATE(%) (K)	PRİCE (YTL/kg) (F)	ANNUALNET İNCOME (YTL/da) $G=V_y \times K \times F$
Wheat	500	40	0.50	100,00
Barley	400	40	0.45	72,00
Wheatstraw	400	90	0.20	72,00
Barleystraw	300	90	0.10	27,00
Sunflower	300	55	0,60	99,00
Sugarbeet	5000	50	0.12	300.00
Directincome sup port	10YTL/da	---	---	10 x 4 – 40
NET INCOME (Main crop) $G_A=(G_b+G_a+G_y+G_{ay})$	571,00			
NET INCOME(secondary crop) $G_Y=(G_{bs}+G_{as}+G_{d.das})$	139,00			
NETINCOMETOTAL (Y TL/da) $G_{NY}=G_A+G_Y$	710,00			
ANNUALNETINCOME $(G_N=(G_{NT}/Dön.Say.)$	710,0 0/5= **142,00 YTL/da**			

planting plan in 1st class watered land = SB + SF + W + B + U = 5 years

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Table 5 Local crops and production grown in the 2nd class watered land.

PLANTS	PRODUCTION WATERED (kg/da) (V_s)	PRODUCTION DRY (kg/da) (V_k)	NET INCOME RATE	PRICE (YTL/kg) (F)	ANNUAL NET INCOME (YTL/da) $G=V_s \times K \times F$	
Wheat	400	300	40	0.50	80,00	60,00
Barley	300	200	40	0.45	54,00	36,00
Wheatstraw	300	225	90	0.20	54,00	40,50
Barley straw	250	150	90	0.10	22,50	13,50
Sunflower	200	120	55	0,60	66,00	39,60
Sugarbeet	4000	---	50	0.12	240,00	---
Direct income support	10 YTL/da	10 YTL/da	---	---	4x	3x10,00
NET INCOME (Main crop) $G_A=(G_b+G_a+G_y+G_{gp})$	440,00	135,60				
NET INCOME (secondary crop) $G_Y=(G_{bs}+G_{as}+G_{d.des})$	116,50	84,00				
NET INCOME TOTAL (YTL/da) $G_{NY}=G_A+G_Y$	556,50	219,60				
ANNUAL NET INCOME $(G_N=(G_{NY}/Dön.Say.)$	556,50/5= **111,30 YTL/da**	219,60/4= **54,90 YTL/da**				

planting plan in 2nd class watered land = SB + SF + W + B + U = 5 years
planting plan in 2nd class dry land = SF + W + B + U = 4 years

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Table 6 Local crops and production grown in the 3rd class dry land.

PLANTS	PRODUCTION WATERED (kg/da) (V_s)	NET INCOME RATE (%)	PRICE (YTL/kg) (F)	ANNUAL NET INCOME
Wheat	225	40	0.50	45,0 0
Barley	150	40	0.45	27,00
Wheatstraw	170	90	0.20	30,60
Barleystraw	125	90	0.10	11,25
Direct income support	10 YTL/da	---	---	10 x 3 = 30
NET INCOME (Main crop) $G_A=(G_b+G_a+G_y+G_{gp})$	72,00			
NET INCOME (secondary crop) $G_Y=(G_{bs}+G_{as}+G_{d.des})$	71,85			
NET INCOME TOTAL (YTL/da) $G_{NY}=G_A+G_Y$	143,85			
ANNUAL NET INCOME $(G_N=(G_{NY}/Dön.Say.)$	143,85/3= **47,95 YTL/da**			

planting plan in 3rd class dry land = W + B + U = 3 yıl

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Application

According to **the bare value avarege** calculated in Table 3, and annual net income average for the land class in Tables 4,5,6, and Table 7 is formed to calculate **the local rate of interest capitalization**.

Table 7. Local rate of interest capitalization

LAND CLASS	PRICE(YTL/da)		ANNUALNET INCOME(YTL/da)		LOCALRATEOF CAPITALIZATION INTEREST (%)			
	Watere d	Dry	Watered	Dry	Watered		Dry	
1	1502,81		142,00		0,094	0,093	---	
2	1221,95	498,23	111,30	54,90	0,091		0,110	0,115
3		398,89		47,95	---		0,120	

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Application

All these rates are between the 3-15 % which is the legal obligatory of the Supreme Court 18th Law Office. After the calculation of these rates, valuation grades of 11 lands belong to the National Estate Management are calculated as in Table 8.

In the last step of the calculations, value of 11 lands are calculated as seen in Table 8.

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Table 8. The location grades of the valuated parcels.

Locational Valuation Critera Ölcütleri	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11
The facility of Producing new parcel (adet)	-3	5	2	5	4	-3	5	2	3	2	5
Distance to main road (km)	-2	5	5	4	5	3	5	1	4	-3	-2
Distance to village centre (km)	3	-1	-1	3	1	1	-3	2	-1	5	0
Distance to petrol station (km)	-2	3	3	4	3	2	5	-1	-3	-3	-3
State of electricity	5	2	2	5	2	2	5	5	2	2	5
Facility of irrigation	3	3	3	8	3	3	8	3	3	3	8
Slope	-1	3	3	3	3	3	6	-1	3	-1	3
Soil class	0	4	4	4	4	0	8	0	0	0	5
Regional crop variety (fruit, clover, wheat, barley, potatoes, onion, o af, fiğ, sugar beet, …)	1	3	3	3	3	1	3	1	3	1	3
One piece land	4	4	4	4	4	4	4	4	4	4	4
Cadastral	1	1	1	1	1	1	1	1	1	1	1
Geometry of the land	-3	3	3	3	3	3	3	3	3	3	3
Land size	4	5	4	3	3	2	4	3	3	1	5
Property security	1	1	1	1	1	1	1	1	1	1	1
Rate of Total Value Increase	**11**	**41**	**37**	**51**	**40**	**23**	**55**	**24**	**26**	**16**	**38**

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Table 9. The current cost calculation of the valuated percels.

SN	block	Parcel	Area (da)	Landclass	Landplantation plan	Net income (G) da/yıl	Value (D=G/k)	Location value (%)D_k	Currentvalue RB=D .(1+D_k) TL/d a
D1	250	12	253,80	3.C .dry	W+B+ U	40	347,83	11	386
D2	238	80	389,01	2.C.watered	SB+SF+W+B+ U	116,42	1251,83	41	1765
D3	238	79	344,31	2.C .dry	SF+W+B+ U	58,00	504,35	37	691
D4	238	77	202,45	1. C..watered	SB+SF+W+B+ U	145,66	1566,24	51	2365
D5	238	65	23 3,96	2.C..dry	SF+W+B+ U	51,48	447,65	40	627
D6	238	19	99,00	3.C. dry	W+B+ U	40	347,83	23	428
D7	226	18	298,60	1. C.watered	SB+SF+W+B+ U	147,95	1590,86	55	2466
D8	219	51	186,00	3. C.dry	W+B+ U	40	347,83	24	431
D9	219	20	188,00	3. C.dry	W+B+ U	47	408,70	26	515
D10	215	42	60,00	3. C.dry	W+B+ U	33,8	293,91	16	341
D11	214	29	415,90	2.C.watered	SB+SF+W+B+ U	121,42	1305,59	38	1802

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4. Conclusions

The usage of the land which is one of the basic components of human life for urban, industrial, transport and agriculture has been increasing day by day. The intensive demand to the agricultural areas from different sectors and nourishment, the value of the agricultural lands has been changing.

For this reason, the valuation of the agricultural lands become important. Land valuation is done fort he aims like, nationalization, buying, getting loan and mortgage.

Whatever is the aim, the valuation has been done according to the **income management** as it is a legal obligatory. However, **locational value** raise and **conjuncture** are always neglected in these evaluations.

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Conclusions

Everybody knows that the prices are not true. Instead of these prices villagers' statements who are under oath are taken into the consideration. In order not to be these happen, land buying and selling charges and land taxes should be abolished or decreased in the rate of 0,1%.

In this way the real prices of the land will be given to the Property Registration Managements and the valuation map will be formed easily, the groups of buyers and sellers and public will be protected against deceive by current and reliable data.

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THANKS

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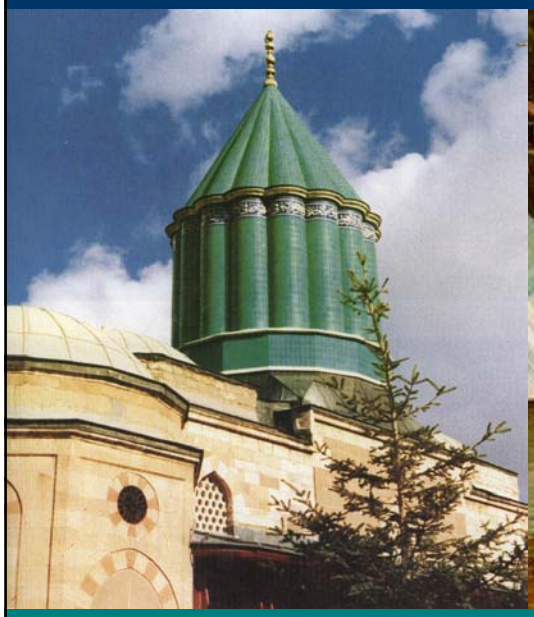

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