

# ANALYSIS OF IMPACT OF LAND QUALITY ASSESSMENT IN REGIONS OF LATVIA FOR AGRICULTURE LAND VALUE

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## Abstract

The article analyses the impact of land quality assessments on the agricultural land value. Therefore was analysed data on agricultural land quality assessment. Detailed analysis has been chosen in municipality rural territories of municipality of Dobele, where was studied the numbers and prices of transactions general in land market and on the land quality groups. The article assessed base values of agricultural use land in municipality rural territories of municipality of Dobele.

**Key words:** *agriculture use land, land quality assessment, land quality group, municipality, municipality rural territory.*

## Introduction

Land quality affects crop yields, acquiring production levels and cost of crop, thus the efficiency of agricultural production and size of profit. A man with his activities can not radically change the quality of the land, but with some activities land can be improved, for example, performing reclamation or chalking the areas, or land condition can be worsen, for example, mishandling it or overgrowing it with bushes. There is need for correct land quality assessment, what is appropriate for requirements of this time, for which is serving the land quality assessment. More and more is discussed about the quality of land, as an indicator, relevance and actualization.

The quality of soil and its ability to resist the development of degradation process significantly impact soil physical properties. Soil physical properties are characterized by interrelationships between the soil solid phase and pores in soil mass. Soil solid phase particles in result of different physical, physico-chemical and chemical factors are grouping, binding and arranging thus creating soil structure that better or worse are providing for plant root growing and spreading, promotes or limits the formation of moisture regime need for plants, providing air and gas exchange between soil and atmosphere, as well as perform a number of other functions. Soil physical properties is one of the major determinants of soil fertility, thus, together with other factors contributing to the major soil functions – option of sustainable agricultural production – realization. Besides that soil physical properties significantly impact the functions of biodiversity conservation and environmental quality assurance, determine the intensity of some types of soil degradation (Līpenīte, Kārliņš, 2011).

If the land is properly used, it not only will not wear out, but on the contrary – is improving, becoming more fertile. Rational use of land, can lead to increasement of amounts of production from the same land (Locmers, 1978).

Latvian agricultural land potential is 2.3 million. ha, from which currently around one million agricultural land is not being used or being used very inefficiently, which is contributing factor to the current problems the country is facing (unemployment, low incomes in rural areas, rural abandonment, low competitiveness of the sector, etc.) (Lauksaimniecības situācijas apraksts..., 2013).

The aim is to investigate whether the qualitative assessment of the agricultural land impact the cadastral value.

Tasks: To find out the factors affecting land quality assessment. To understand how is done the cadastral value-based development process. Find out how the qualitative assessment impacts the cadastral value.

## Methodology of research and materials

By switching to intensive management system, in Latvia in the fifties were increasing needs for specific, precise information concerning the land quality of each land user's possessed land. The answer to that is given by land qualitative assessment – the method by which is fixed the soil and other natural conditions overall usefulness degree for agricultural production. The comparative quality of land area is numerical, shown in prominent way by rating entries and points (Boruks, 1991).

Land evaluation point is a relative figure, which shows the productivity of specific natural conditions complex, compared to the republic better lands that are adopted for valuation benchmark and evaluated with 100 points (Boruks, 1991).

The best land with very good soils and favorable technological conditions of areas for the production, which ensures all crop mechanized cultivation facilities and high yield extraction, was divided into Class

1 and evaluated with 100 points. Low-value soils, also soil with outstanding moisture and for production unsuitable technological conditions, foreseen in the class 10 and evaluated with 5 points. The rest of the land, according to their quality, was divided in class 2-9. Land assessment points were read from the land valuation tables, according to soil type and improvement degree. In these tables points were determined with certainty 3 or 4, for example 42, 45, 48, 52, etc. (Boruks, 1991).

In the instruction of soil mapping and land quality assessment, developed by the State Land Service, land quality assessment is explained as land comparative assessment in points by normative productivity (quantity of crop production, which could be obtained by the average land use, intensification of production and organization level). In this instruction were simplified the land quality assessment in points by productivity, with 5-point accuracy, for example, 40, 45, 50 and so on.

Quality of agricultural land is characterized by land productivity (or gain which the soil may give to the owner, if it is properly processed and used). Land productivity is depended from soil type (sod podzolic, sod carbonate, etc.), mechanical structure of soil (clay, loam, sand, etc.), bedrock, soil acidity reactions, drainage system status, land unit contours and areas, stoniness, relief (Vērtēšanas pamatprincipi, [b.g.]).

Agricultural land, depending on the agricultural land quality assessment in points by normative productivity (one ball land values – 70 kg of rye units), are divided into seven groups of quality (Kadastrālās vērtēšanas noteikumi, 2006):

- quality group I                    less than 10 points
- quality group II                    from 10 to 19 points
- quality group III                    from 20 to 30 points
- quality group IV                    from 31 to 40 points
- quality group V                    from 41 to 50 points
- quality group VI                    from 51 to 60 points
- quality group VII                    more than 60 points

Taking into account the real estate transaction prices for agricultural land, municipality's territories are combined in value level groups and for one of such groups fit the municipality's territories with a similar price level as for agricultural land quality group IV (Kadastrālās vērtēšanas noteikumi, 2006).

In municipalities territories, where the number of transactions on agricultural land is less than five, belonging to a certain value level group is determined by comparison with the municipal territories, whom has set out land price levels, assessing the main agricultural land values influencing factors (such as land quality, land use composition, area, location, encumbrances) and local socio-economic development indicators (such as the amount of income tax per inhabitant, unemployment, rate of the economically active population).

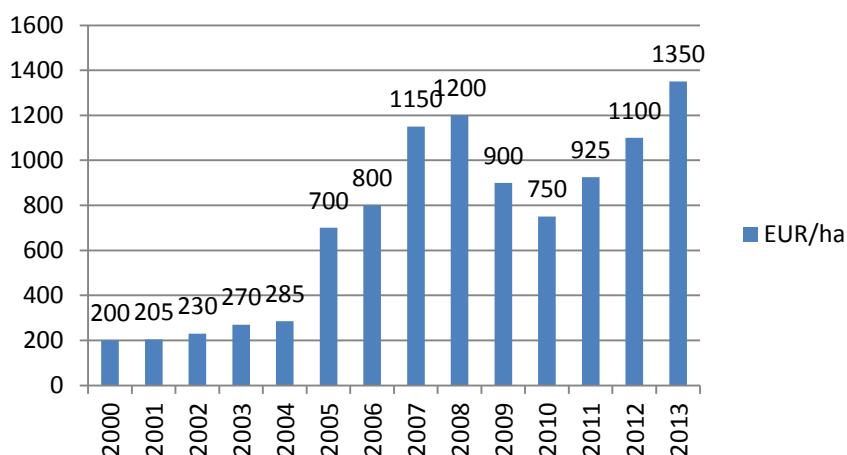
In agriculture land value zoning whole national territory is divided into 21 value levels (14 – in rural areas and 7 – in urban areas). For each quality group has determined agricultural land base value EUR/ha, which are used for the calculations of values.

Agricultural land base value is fixed in euro per hectare of all agricultural land quality groups in each local government territory, with the exception of urban areas. In urban areas determine one land base value (without considering land quality group) for all intended use from the target group of "agricultural land" and "water object land". Land base value is determined by the higher base value, as is the case for rural communities bordering the city. Agricultural land base value in urban areas is set in euros per square meter (Kadastrālās vērtēšanas noteikumi, 2006).

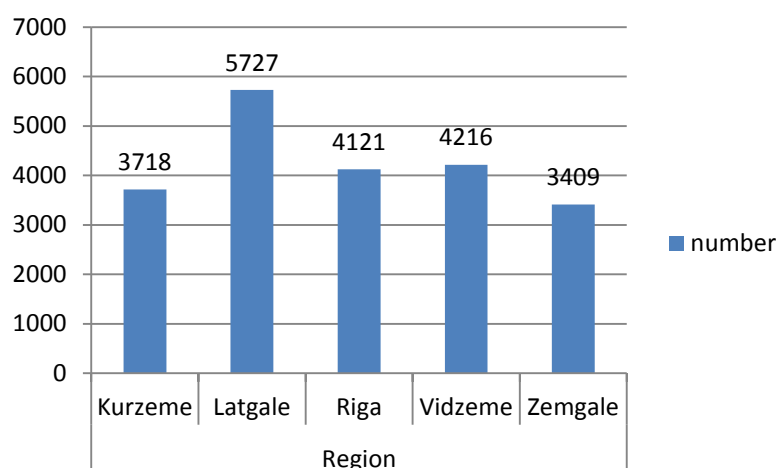
## **Discussions and results**

According to information from the State Real Property Cadastre Information System about weighted average of territorial units of agricultural land quality assessment on the situation as 01.01.2016.registered 2,38 million ha of agricultural land, including 1.70 million. ha of arable land. Latvia is a green land, because almost half of its territory is covered by forests. Along with water, swamps and bushes occupying the most part of Latvia. Consequently, only 137 from agriculture use land of 511 local municipality rural territories covers more than 50% of the total area. In this list practically no local government territories from Vidzeme. Most of these territories are in Latgale, where the average assessment is slightly more than 30 points. Local government territories of Kurzeme average evaluation is slightly more than 40 points, but in 35 local government territories of Zemgale - an average of 54 points. The highest weighted average agrivulture land quality assessment is in municipality of rural territory of Svitene of municipality of Rundale - 67 points, the lowest in municipality of rural territory of Kolka of municipality of Dundaga - only 16 points. Here it should be noted that in the municipality of rural territory of Kolka agriculture land

use area is only 3.3% from the total area of the municipality of rural territory. Total maintained the price increase in transactions with agricultural lands in the country. The influence of period of 2008 crisis in two years were observed decline of prices, but starting from 2011 also agricultural land market is recovering and prices are increasing every year. The average price per hectare in the country compared agricultural land to 2013 from 2012 is increased by ~ 20% (Fig.1).



**Fig. 1.** Changes of price of agricultural land (EUR/ha)



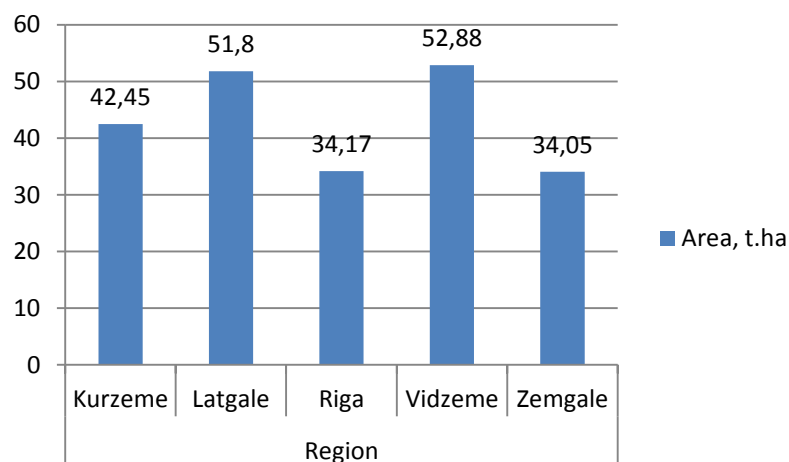
**Fig. 2.** Number of transactions with rural land

Also in 2014 was observed increase of price in transactions with agricultural land. The increase is not as rapid because in market of rural land come the more and more uncultivated areas and partly overgrown with bushes, where prices of transaction to the same with land quality assessment are slightly lower. In the market of rural land is also a tendency, that the poor quality of the land price is approaching the most expensive level of land price.

Transactions of rural land are in all regions, but most activity of transactions of rural land (both agricultural and forest land) are in Latgale and Vidzeme (Fig.2, Fig.3).

Latgale is the largest number of transactions, but the total area is more sold in Vidzeme. During from 2012 to 2013 year in Latgale and Vidzeme sold more than 50, 000 hectares of rural land.

To determine base values of agricultural use land are used transactions that characterize directly agricultural land. It means that other type of land use for example the impact of forests is minimal. For the analysis used land units which agricultural land area is least 3 hectares and land of forest area is less than 20% of the total area. Calculations are not used transactions, where showing that the land was purchased near the water for recreation than for agricultural purposes and transactions with extreme - uncharacteristic values (VZD, 2014).



**Fig. 3.** Total area of transaction of rural land in regions (%)

Agricultural land values are influenced by several factors, including land fertility. Article will be viewed municipality of Dobele distribution of agricultural land in land quality groups, and in this aspect analyzed transactions with agricultural land in the period from 2011 to 2014 year.

**Table 1**

Distribution of agriculture use land in Municipality rural territories of municipality of Dobele by quality groups

Territorial unit	Area of land use, ha							Total area of land use, ha
	0-9	10-19	20-30	31-40	41-50	51-60	>60	
Annenieku	0.0	36.8	709.4	706.2	3512.8	388.6	23.3	5377.1
Auru	3.5	39.8	436.8	731.6	1528.9	1453.5	1119.8	5313.8
Bēzses	0.0	7.4	20.6	88.7	1014.5	3647.4	1730.7	6509.4
Bikstu	0.0	61.1	329.9	1089.1	1912.5	1068.3	0.0	4461.0
Dobeles	0.0	5.9	135.9	440.1	1238.3	2904.9	593.6	5318.6
Jaunbēzses	0.0	29.0	303.2	172.2	1020.1	2568.3	1088.7	5181.5
Krimūnu	0.1	0.0	20.0	70.8	302.1	2424.4	3046.5	5863.9
Naudītes	0.0	16.1	1013.5	1930.0	1337.6	39.1	3.9	4340.2
Penkules	1.7	24.3	349.7	368.7	895.7	2270.4	1570.5	5481.1
Zebrenes	1.2	32.4	483.8	2667.4	278.9	0.0	0.0	3463.7

Considering municipality of Dobele agriculture use land distribution by land quality groups, I conclude, that the greatest scattering between land evaluation points in municipality rural territory of Auri of municipality of Dobele (Table 1, Table 2). In all other municipality rural territories in one the land quality groups includes more or almost half of all area of agricultural use land. Therefore, continue to analysis of information, special attention will be devoted municipality rural territory of Auri. After data of map of land evaluation can be concluded, that best quality lands of municipality rural territory of Auri is located in the southern part of the municipality rural territory, but the direction of the north land quality decreases. Next were analyzed transaction prices of market of agricultural land.

The table includes only those transactions which the land use purpose defined as agricultural land (Table 2). As well as agricultural area greater than 3ha and is at least 70% of the total land area, forest land, less than 20%.

Table 2

Distribution of agriculture use land in Municipality rural territories of municipality of Dobele by quality groups, expressed as %

Territorial unit	% from total area of land use						
	0 - 9	10 - 19	20 - 30	31 - 40	41 - 50	51 - 60	> 60
	I	II	III	IV	V	VI	VII
Annenieku		0.68	13.19	13.13	65.33	7.23	0.43
Auru	0.07	0.75	8.22	13.77	28.77	27.35	21.07
Bērzēs pagasts		0.11	0.32	1.36	15.58	56.03	26.59
Bikstu		1.37	7.40	24.41	42.87	23.95	
Dobeles		0.11	2.56	8.27	23.28	54.62	11.16
Jaunbērzēs		0.56	5.85	3.32	19.69	49.57	21.01
Krimūnu	0.002		0.34	1.21	5.15	41.34	51.95
Naudītes		0.37	23.35	44.47	30.82	0.90	0.09
Penkules	0.03	0.44	6.38	6.73	16.34	41.42	28.65
Zebrenes	0.03	0.94	13.97	77.01	8.05		

Table 3

The number of transactions and average prices of transaction with agriculture use land (2011-2013)

Municipality rural territory	Value zone 2015	III		IV		V		VI		VII		Total	
		number	average price	number	average price	number	average price	number	average price	number	average price	number	average price
Annenieku	6					8	2554	1	3130			9	2618
Auru	2	1	2082			3	2478	5	3130	1	4340	10	2951
Bērzēs	1					1	1824	8	3178	5	2956	14	3002
Bikstu	7			2	2627	6	2299	2	2659			10	2437
Dobeles	2					1	2233	3	2169	2	3285	6	2552
Jaunbērzēs	2					5	2987	3	3543			8	3196
Krimūnu	1			1	2893	1	4229	8	3606	7	4050	17	3783
Naudītes	7			3	2303	4	2544					7	2441
Penkules	4					1	2846	2	4203	3	2638	6	3194
Zebrenes	9			2	1621	1	1565					3	1602
<b>In quality group:</b>		<b>1</b>	<b>2082</b>	<b>8</b>	<b>2287</b>	<b>31</b>	<b>2564</b>	<b>32</b>	<b>3247</b>	<b>18</b>	<b>3442</b>	<b>90</b>	<b>2952</b>

Transactions show that the transaction price of agricultural land is very different either in municipality perspective or in each individual municipality rural territory. The reasons may be different, but the unifying factor that affects the entire purchase price is a qualitative assessment of land. This is clearly shown also in analyzed transaction row of municipality rural territory of Auri. In quality group III transaction was carried out for 2082 EUR/ha, gradually increasing to 4340 EUR/ha in quality group VII. In one single municipality rural territory usually in each quality group the number of transactions is not sufficient to obtain an objective picture of the market prices. Therefore it is essential to view the information also in scope of region, municipality or comparing nearest municipalities and municipality rural territories to each other. Summary row of Table 3 together in municipality by quality groups clearly demonstrates that land qualitative assessment has a direct impact on the market price and thus also on the cadastral value. The higher valuation of land in points means that the higher price is paid.

In accordance with Republic of Latvia Cabinet Regulation No. 305 "Regulations regarding Cadastral Assessment" requirements, the base value of the cadastral value is fixed to 85% compliance with market values.

Analyzing market data, mutually comparing the territories, socio-economic indicators, for each municipality rural territory is specified a particular level of value and appropriate base value. Table 4 shows the base value of agricultural land by quality groups, which entered into force on 01.01.2015.

**Table 4**

Base values of agricultural use land in rural areas (euro/ha)

Territorial unit	Value zone	Land quality group						
		I	II	III	IV	V	VI	VII
Bērzes	1	156.52	1 159.64	1 323.27	1 437.10	1 593.62	1 863.96	2 162.77
Krimūnu	1	156.52	1 159.64	1 323.27	1 437.10	1 593.62	1 863.96	2 162.77
Auru	2	149.40	1 074.27	1 237.90	1 337.50	1 479.79	1 735.90	2 020.48
Dobeles	2	149.40	1 074.27	1 237.90	1 337.50	1 479.79	1 735.90	2 020.48
Jaunbērzes	2	149.40	1 074.27	1 237.90	1 337.50	1 479.79	1 735.90	2 020.48
Penkules	4	135.17	917.75	1 067.15	1 166.75	1 266.36	1 479.79	1 735.90
Annenieku	6	120.94	775.47	910.64	996.01	1 067.15	1 266.36	1 479.79
Bikstu	7	113.83	704.32	832.38	910.64	981.78	1 159.64	1 365.96
Naudītes	7	113.83	704.32	832.38	910.64	981.78	1 159.64	1 365.96
Zebreņes	9	99.60	576.26	682.98	739.89	811.04	974.67	1 152.53

Municipality rural territory of Auri is located in central part of the municipality of Dobele, bordering with Dobele city, municipality rural territories of Krimuna, Tervete, Penkule, Naudite, Annenieki and Dobele (Figure 1). Nearest municipality rural territories are included in different (1; 2; 5; 7) groups of value levels.

Considering the agricultural land average assessment in points and land market price levels, is the differences between the municipalities are so great? The following table shows (Table 4), that the base value differences between the second (municipality rural territory of Auri) and seventh (municipality rural territory of Naudites) value level, for example for quality group IV has ~ 425 EUR/ha (respectively 1 337.50 and 910.64). In municipality rural territory of Auri the base value of agricultural land till 30 points (quality group III) is higher than municipality rural territories of Naudite and Annenieki base value for quality group V. Seeing the situation, the question arises: Is it necessary the agricultural land of one municipality territory divide in several zones of value?

In municipality rural territory of Auri, which is bordering with municipality rural territories of Tervete, Krimuna, agricultural land quality evaluation in points is the highest. Agricultural land largest areas are in territories between the forests and railway. Within this area the dominating land quality assessment is from 40 to 50 points, as a result of soil type and mechanical composition.

In order to avoid such a drastic value transitions, probably there is need for some changes in legislation and should allow for cases where particular administrative territory of municipality can be divided on two levels of value. Municipality rural territory of Auri could be one of the municipality rural territories, which could serve as a transitional stage between the very valuable level territories and less valuable lands. In division of zones of rural municipality territories, the exceptions should be allowed only in places where the terrain is changing, therefore the soil type and its mechanical content is changing, affecting agricultural land evaluation in points and where it is possible to determine the border area of the value zone. In the territory of one municipality, where there is changes in agricultural land evaluation in points and between neighboring municipalities have different agriculture land value level group, could smooth out the difference of base values.

### Conclusions and proposals

1. Last time the whole country carried land quality assessment was from 1971 to 1978, part of the area from 1981 until 1991. Therefore is necessary updating data of land quality assessment.
2. For calculation of base value of agricultural use land used method of transaction comparison.
3. Market information is analyzed in municipalities by land quality groups of agriculture use land, market information shows that the significantly affect of land quality on the price and cadastral value.

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