SYSTEM OF VALUES OF AGRICULTURAL LANDS: ECONOMIC SUBSTANTIATION

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The article presents a technique of evaluation of lands intended exclusively for agricultural purposes for a region like rayon or oblast, under the conditions of significant differences in efficiency of their exploitation by certain farms located in the region which are the result mostly of economic causes.

The urgency of development of such a technique is determined by increasing demand to have reliable indicators of value of land, especially fair market value and economic value. The causes for this demand are the growing capitalist relationships involving lands. Under conditions of poor land market neither market prices, since the number of registered land transactions is too small to make a reliable conclusion about land value, nor the net income of an owner of land, since it greatly differs from one owner to another due to obstacles to land transactions, can be a ground for evaluation of land. Hence, an approach based on modelling techniques seems to be a realistic way of satisfying this demand.

The technique have been approved in 1994 when determining a system of value indicators for typical lands of Moscow oblast as a whole, its rayons and soil zones.

The variety of economic roles of land leads to the different sights on its value from the point of view of different agents. Thus, the system of values of land must include special indicators which correspond to the interests of an owner, of an user, and of the national economy.

All the mentioned types of value must be classified, in turn, according to the rate of reflecting economic factors including conjuncture. For example, a figure of a plot value recorded in state register of lands or in balance sheet must reflect explicitly the varieties in value caused by the factors which are immanent to land itself, especially by its fertility and location. Indeed, the fluctuations in economic environment will cause land prices to change, but no sense to correct the data in accounting documents and registers in every occurrence of prices fluctuations. When appraising land to be bought, sold or rented for a long period a specific economic environment of a given plot must be taken into consideration with regard to the land being a long-term asset, hence, both sides involved in transaction sure take into consideration probable economic situation in long term. Valuing the land being urgently marketed, or rented for a short period, or used as a guarantee of a loan, one should completely take into account the influence of short-term economic conjuncture on the land prices.

Also, the value depends on the constrains taken into consideration when calculating it. In particular, according to the statistics of land transactions in the Moscow oblast, prices of the lands which are allowed to be used for recreation are ten and more times higher than the prices of the lands which must be used explicitly as an agricultural resource.

Finally, values of land can be classified according to the level of aggregation.

The complete system of values of land involves indicators showing the value of land from the point of view of all the participants of the relationships on land, reflecting the complete range of levels of considering economic factors, all the possible combinations of constrains and all the possible levels of aggregating. The sense of a value indicator is completely clear only in case when all the four components of the sense are clearly and completely defined.

The presented technique is based on the income approach which is world-widely approved and used for practical evaluation of land. Usually the best opportunity of exploitation of land is taken into consideration, then this approach is applied in a direct manner. Under the conditions of Russia and, in particular, of Moscow oblast, due to the significant differences between the rentability of plots of equal quality exploited by different users, this technique do not produce reliable results, because since an alternative of using a given plot is chosen, it is not available for the next plot, and the next-best alternative is probably significantly less rentable. So, one has to solve the following problem: how rentable is an alternative which determine the value of land when the best available alternative is already selected for each plot. To solve it, one can successfully apply the methodology of classic model of supply and demand equilibrium on the land market of the given region.

The demand curve of the model reflects marginal benefits for an agent whose point of view is mentioned when valuing land, caused by expanding land area of farms. The supply curve reflects marginal costs (losses) for the same agent caused by reducing land area of farms. Hence, the result is the value of land from the point of view of this economic agent.

To produce the required type of value, the constrains can be taken into consideration in the following manner. The probable supply and demand which do not satisfy the required constrains should both be excluded from the total supply and demand.

The level of considering conjuncture depends on the manner of calculating marginal costs and benefits: calculating them in the longest term leads to ignoring conjuncture, calculating in the long term allows to consider long–term conjuncture, short–term marginal figures lead to considering short–term conjuncture.

The result achieved due to the model of this type is always very aggregated figure, since it relates to a typical land for the region.

For the presented model, the economic agents are to be the whole set of agricultural farms of the oblast (the version to determine the farm value of land) and the national economy (to determine the economic value of land). Speaking about constrains the only transactions consider to be allowed which do not affect the way of using land. In other words, it must be used for agricultural production both before and after probable transaction. The time horizon for considering conjuncture is five years. It results in taking into consideration long-term conjuncture.

So all the four components of the sense of the resulting value are now defined.

The severe obstacle for modelling market equilibrium is a complexity of methodologies of defining marginal costs and benefits. Though the most reliable way is to simulate the expansion (reducing) land area of each farm of the region in order to calculate the difference in net benefits, its practical implementation seems to be very problematic due to a lot of data to be collected and a lot of specific features of certain farms to be mentioned. The following method is more realistic. According to it, one does the following.

1) Determines the annual net benefits for an agent who's sight on the value of land is considered, produced by the marginal unit of farm's land.

2) Capitalises these values.

3) Determines the average cost of agent's capital needed to provide the benefit calculated at step 1 per unit of farm's land.

4) Deducts the capitalised net benefits calculated at step 2 by the average cost of capital per unit of land calculated at step 3.

5) Divides the figure calculated at step 4 by the relative rentability of the farm's land and multiplies it by the relative rentability of the typical land of the region.

As a result one obtains the probable earnings (losses) for the agent resulted by the marginal unit of typical land used by the certain farm. These can be interpreted as the marginal benefits and costs.

From these figures calculated for each farm and the areas of the farms one obtains probable supply and demand functions in an usual way.

To calculate the values of specific plots of land one applies the data which reflects relative rentabilities of lands of different quality. The ratio between the value of a given plot and of a typical land of a region is the same as the ratio between their relative rentabilities. Due to the activities on determining relative rentabilities of lands of different quality which took place in the former USSR and the former GDR and were based on the approach developed since V.V. Dokuchaev, a wide range of data and techniques is now available which is completely satisfying the demands of transformation aggregated land values into detailed.

The complete model was tested in Moscow oblast for computing so called farm values of land and economic values of land for the whole oblast, its rayons and soil zones. Though both these indicators consider evaluated land to be an object for explicitly agricultural use and take into account long-term economic tendencies, the former reflects the financial intents of the whole set of the farms of the region, and the latter reflects goals of the national economy. The economic values were computed on the basis of two approaches to identifying and evaluation of economic costs and benefits. The first approach is recommended by the World bank for the purposes of economic analysis of projects. It is grounded on a concept of opportunity cost. The second was developed in the Moscow Agricultural Academy n.a. K.A. Timiryazev due to V. Nemtchinov, S. Sergeev, A. Gataulin. Its basic concept is the total economic expenses for agricultural production.

The analysis of the computed data showed that under the present conditions in the Moscow oblast the net benefits being received by the national economy caused by the use of land are significantly more valuable than the net benefits being received by the agricultural farms.

This is a common situation that the use of land is completely unprofitable for the farms since it is very beneficial for the national economy. The table 1 shows that there are 162 farms which use land in the way which is not efficient for themselves; only 109 of them use land in the way which is destructive for the national economy from the point of view of the first approach; from the point of view of the second approach, there is no farms in the oblast using land in the destructive way. Thus, the severe contradictions between the intents of farms and of the national economy take place.

1. Comparison of the levels of marginal net benefits for the farms and for the national economy produced by cultivated land (April 1994)

Level of marginal net benefits (mln.rubles per hectare)	Number of farms		
	marginal net benefits for farms	marginal net benefits for the national economy (1st approach)	marginal net benefits for the national economy (2nd approach)
Less than -6	43	37	0
Less than -3	77	59	0
Less than 0	162	109	0
Less than 2	224	159	4
Less than 5	276	223	21
Less than 10	303	293	188
Less than 20	324	317	313
Less than 50	345	344	348

As the result, the farm values of land are significantly less than the economic values as it is reflected by the table 2. In this table the values of typical lands for selected regions are shown.

2. Values of typical lands for Moscow oblast and some rayons
(mln. rubles per hectare, April 1994)

Regions	Farm values	Economic values	
		1st approach	2nd approach
Istrinsky rayon	7.94	11.54	10.01
Taldomsky rayon	2.88	10.05	3.89
Zagorsky rayon	2.69	9.69	4.22
Lukhovitsky rayon	1.28	13.28	1.82
Stupinsky rayon	—	5.76	0.36
Moscow oblast	2.40	7.76	4.32

The relatively low correlation between the values of different types is the result of planned specialisation of rayons on certain branches of agricultural production.

It was grounded that even if only the long-term economic factors are taken into consideration, the value of land in the Moscow oblast does not depend on the natural qualities of land. In the table 3 it is shown that in all the soil zones of the oblast the distribution of farm marginal net benefits is quite similar, though the difference between natural fertility of lands of different soil zones is significant. In the 1st zone there are the worst soils prevail like humid podsols, in the 5th and 6th there are the best soils like grey forest soils and black earth. To the author's opinion, relative independence of the marginal net benefits and values of lands on the soil fertility is a result of relatively high level of intensity of agricultural production in the suburban farms.

3. The distribution of farms of different soil zones
according to farm marginal net benefits of their lands

Group	The range of farm marginal net benefits of farms' land (mln. rubles per hectare, April 1994)	The share of farms of the group in the whole number of farms of the soil zone, %				
		Zone 1	Zone 2	Zone 3	Zone 4	Zones 5 and 6
1	Less than -6.000	3.1	10.2	7.1	8.8	—
2	-6.001...10.000	87.5	68.8	58.6	66.6	89.2
3	10.001...36.000	9.4	12.3	24.2	15.8	8.1
4	Greater than 36.001	—	8.7	10.1	8.8	2.7
Number of farms in the soil zones		32	138	99	57	37

It was shown that the most important factor of the value of land in the oblast is the level of economic development of farms of a region. The correlation analysis showed that there is a correlation between the amount of capital and per 1 hectare and land value, between amount of labour applied to 1 hectare of land and land value (as large as 40...50% both for different types of value), while there is no correlation between the soil fertility rate and the value of land. This is caused by the relatively high level of intensity of the agricultural production in the region and by the significant differences in specialisation and intensity of production in certain farms.

To the opinion of the author and his colleagues, the contradictions between the intents of farms and of the national economy, the lack of benefits from cultivating land for farms in comparison with whose for national economy are the result of lack of a realistic and oriented land policy both on federal and regional levels. Due to that, wide land areas are being excluded from agricultural use and involved in other spheres of economic activities. This process leads to lack of food in Russia. The completed research formed a basis for a set of principles of organisation of land market, of ensuring that the land is used for the purposes it intended for, of financing farms on the principles of land mortgage. Also, it supplies an additional confirmation to the suggestions of a lot of researchers related to improving price system for resources for agricultural production and its products, economic activities intended for protection of agricultural production and of the national market of food.