Present-day situation and potential of agricultural land use in Omsk region

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Abstract. The article discusses the main characteristics of agricultural land use in the Omsk region: the size of land use by regions and agricultural organizations, their legal status; the state of their main production parameters - fertility, technological properties, location relative to economic centers and centers of economic influence on land use. These parameters mainly determine the production potential of agricultural land use. The land use was grouped by the size of the land used, which made it possible to calculate the share of land used in agricultural organizations on the basis of ownership and lease. The current disadvantages of land lease and their economic consequences are indicated. A significant variety of the basic dimensions and legal status of lands has been established both in the region as a whole and in the natural and agricultural zones. Based on the quality of land, their production potential has been determined. It is shown that their zonal differences form a heterogeneous production basis for agricultural production. To confirm this, an analysis was made of the influence of the production potential of the land on the efficiency of crop production, both for the basic farms of all natural and agricultural zones, and for the region as a whole. The conditions of the realization of the potential of the land are analyzed taking into account labor supply, fund provision and land qualities and their influence on the results and efficiency of agricultural production. Based on this, economic and organizational measures are recommended to reduce differences in the agricultural land use system of the region, as well as increase its production potential.

1. Introduction

Land resources in agricultural industry have an important multifunctional value both as the space for production activity, an indispensable production factor, which is both a unique storage place for natural products and energy, and a kind of natural laboratory enabling to grow the necessary plants [1]. As a result, it is not possible to replace land in the process of agricultural production. The natural land properties are linked to the surface of the planet, which implies their immobility. This factor leads to the problem of spatial differentiation of the land properties and their diversity [2].

The current natural properties are the result of the historical development of the natural complex itself and the anthropogenic impact [3, 4]. Therefore, the soil properties are in constant change. To provide functioning of a number of economic sectors, primarily agriculture, it is necessary to know their current and near future condition. Therefore, studying the condition of land resources, especially the properties determining the potential of a particular industry in a specific territory, is of primary importance [5–7].
The implemented agrarian reforms in Russia provided the land with another important function being immovable assets [8, 9]. Changes in the system of land and property relations have significantly affected the conditions of land use. The relations of land ownership and use have been changed, which has led to manufacturing technology alteration, and, therefore, the nature of anthropogenic impact on land. Therefore, it is possible to say that the newly formed land and property complex of agricultural organizations determines both the directions of further development and the efficiency of agricultural production [10].

2. Research methodology

The study included the following stages:

- conducting a survey of specialists from agricultural organizations and regional agricultural administrations with the objective to assess the conditions and effectiveness of land use;
- grouping land use by the size, including the lands owned and leased by agricultural organizations;
- determining the potential of agricultural land by the region zones (grouping of districts by land quality);
- carrying out an analysis of land use effectiveness in the basic districts of the region;
- preparing proposals for improving agricultural land use.

When conducting the questionnaire, the experts were presented with requirements for work experience and qualifications. The questionnaire made it possible to determine the range of problems in the land use system. These problems were further investigated in more detail by statistical methods, specifically, groupings and correlation-regression analysis of land use parameters and land use results.

3. Research results

The survey conducted reflects a sufficient level of understanding the importance of land use parameters for solving production problems by farm managers and specialists. Questionnaires showed that most farms had soil maps, agrochemical survey materials, and land use patterns. However, a lot of materials were made even before the land reform. An insufficiently clear idea of property relations regarding land resources used by the economy can be stated. Not all experts answered the question about landlords correctly. A significant part of the farms does not correctly characterize the property status of the lands they use and consider the lands leased and used as their property. A part of the leased lands is not registered as separate land sectors. Most households note the presence of unused lands, including the leased ones. However, further analysis shows that these farms use land on a rental basis. A significant part of the specialists of agricultural organizations noted that they have land valuation materials; however, their actual application in land use planning is not noted. Therefore, we can assume that the lands which fail to provide enough efficiency of crop production are still used.

Land resources determine the scale and volume of agricultural production; therefore, they are the main indicators of these resources development potential. At the same time, the size and quality of the land used, along with other factors (fixed assets, machines, equipment, labor) determine the production potential, and the size of these factors owned by the organization determines the property potential. These values and their ratio ultimately determine the efficiency of the production and land use.

The analysis showed that less than a quarter of the farms in the whole region have large land use (more than 10 thousand hectares), almost 30% have average land use (from 3 to 10 thousand hectares), while all the rest have a small size corresponding to farm land use (table 1).

The largest land users are OOO Poltava of Tavrichesky district (47.7 thousand ha), OOO Niva of Russian-Polyansky district (42.4 thousand ha) and SEC Niva of Pavlogradsky district (43.5 thousand ha). Their sizes indicate the starting process of land use holdings generation.
Table 1. Land use characteristics by the size of cropland used by agricultural organizations in the Omsk region

| No. | Zone                      | Organizations number | Cropland area, ha | Less than 1000 | 1000-2000 | 2000-3000 | 3000-5000 | 5000-10000 | 10000-20000 | More than 20000 |
|-----|---------------------------|----------------------|-------------------|----------------|-----------|-----------|-----------|-----------|-------------|-----------------|
| 1   | North                     | 30                   |                   | 5             | 12        | 8         | 3         | 1         | 1           |                 |
| 2   | Northern forest-steppe    | 53                   |                   | 7             | 5         | 3         | 9         | 13        | 15          | 1               |
| 3   | Southern forest-steppe    | 102                  |                   | 27            | 5         | 15        | 13        | 22        | 16          | 4               |
| 4   | Region                    | 280                  |                   | 52            | 36        | 34        | 36        | 55        | 48          | 19              |

Table 2. Area by the type of land right in agricultural organizations of municipal districts of the Omsk region, thousand hectares

| No. | Districts                | Total area | Land owned by organizations | Land leased by agricultural organizations |
|-----|--------------------------|------------|-----------------------------|--------------------------------------------|
| 1   | Novovarshavsky           | 49.8       | 0.2                         | 49.6                                       |
| 2   | Odessky                  | 58.1       | 11.5                        | 46.5                                       |
| 3   | Okoneshnikovsky          | 59.6       | 0.9                         | 58.7                                       |
| 4   | Pavlogradsky             | 156.9      | 101.3                       | 55.6                                       |
| 5   | Poltavsky                | 177.0      | 6.5                         | 170.5                                      |
| 6   | Russian-Polyansky        | 156.6      | 61.8                        | 94.8                                       |
| 7   | Tavrichesky              | 90.3       | 27.3                        | 63.0                                       |
| 8   | Cherlaksky               | 88.6       | 8.5                         | 80.1                                       |
| 9   | Sherbakulsky             | 104.6      | 9.0                         | 95.5                                       |
| 10  | Novovarshavsky district  | 491.4      | 941.4                       | 714.3                                      |
| 11  | Isilkulsky               | 133.6      | 53.2                        | 80.4                                       |
| 12  | Kalachinsky              | 80.0       | 0.2                         | 79.8                                       |
| 13  | Kormilovsky              | 65.2       | 15.8                        | 49.4                                       |
| 14  | Lubinsky                 | 66.7       | 7.0                         | 59.7                                       |
| 15  | Maryanovsky              | 62.3       | 15.6                        | 46.7                                       |
| 16  | Moskalensky              | 88.3       | 13.7                        | 74.6                                       |
| 17  | Omsk                     | 111.7      | 19.9                        | 91.7                                       |
| 18  | Bolsherechensky          | 662.2      | 662.2                       | 519.8                                      |
| 19  | Gorkovsky                | 62.3       | 1.2                         | 61.1                                       |
| 20  | Kolosovsky               | 69.4       | 6.1                         | 63.2                                       |
| 21  | Krutinsky                | 27.5       | 0                           | 27.5                                       |
| 22  | Muromtsevsky             | 27.2       | 1.3                         | 26.0                                       |
| 23  | Nazyvaevsky              | 67.5       | 15.5                        | 52.0                                       |
| 24  | Nizhneomsky              | 33.8       | 0                           | 33.8                                       |
| 25  | Sargatsky                | 19.4       | 29.2                        | 14.4                                       |
| 26  | Tyukalinsky              | 39.1       | 317.9                       | 7.3                                        |
| 27  | Bolsheukovsky            | 356.9      | 356.9                       | 7.3                                        |
| 28  | Znamensky                | 53.6       | 16.7                        | 22.0                                       |
| 29  | Sedelnikovsky            | 20.5       | 12.0                        | 3.6                                        |
| 30  | Tarasky                  | 16.7       | 64.3                        | 1616.4                                     |
| 31  | Tervizinsky              | 22.0       | 29.2                        | 317.7                                      |
| 32  | Ust-Ishimsky             | 12.0       | 7.3                         | 2.8                                        |
| 33  | In the region            | 2088.8     | 2088.8                      | 64.3                                       |

In steppe zone

In southern forest-steppe

In northern forest-steppe

In northern zone

In the region

In the region
Traditionally southern areas have more significant croplands in the context of zones. However, considering the structure of the land, the total land space used in agricultural production varies less significantly.

In the process of land reform, the majority of agricultural land passed into the ownership of individual citizens. A significant part of them is leased to agricultural organizations. Therefore, the bulk of the land used by agricultural organizations of the Omsk region is leased to them (table 2 and 3).

**Table 3. Number of agricultural organizations using leased cropland**

| No. | Zone                | Organizations number | Not available | Less than 1000 | 1000-2000 | 2000-3000 | 3000-5000 | 5000-10000 | 10000-20000 | More than 20000 |
|-----|---------------------|----------------------|---------------|---------------|-----------|-----------|-----------|------------|-------------|-----------------|
| 1   | North               | 30                   | 6             | 3             | 9         | 7         | 4         | 1          |             |                 |
| 2   | Northern forest-steppe | 53               | 8             | 6             | 4         | 2         | 6         | 14         | 4           | 2               |
| 3   | Southern forest-steppe | 102              | 13            | 20            | 7         | 12        | 12        | 23         | 11          | 5               |
| 4   | Steppe region       | 95                   | 1             | 13            | 11        | 9         | 14        | 21         | 15          | 8               |

Only 28 agricultural organizations did not have land leases. In most households, it makes up the substantial part of the land used. The largest lessees are OOO Poltava of Tavrichesky District (47.7 thousand ha) and OOO Niva of Russian-Polyansky District (42.4 thousand ha). At the same time, 45 households rent more than 10 thousand hectares from physical entities and municipalities.

**Table 4. The number of agricultural organizations by the size of cropland in their ownership**

| No. | Zone                | Organizations number | Not available | Less than 1000 | 1000-2000 | 2000-3000 | 3000-5000 | 5000-10000 | 10000-20000 | More than 20000 |
|-----|---------------------|----------------------|---------------|---------------|-----------|-----------|-----------|------------|-------------|-----------------|
| 1   | North               | 30                   | 30            |              |           |           |           |            |             |                 |
| 2   | Northern forest-steppe | 53               | 47            | 1             | 4         | 1         | 2         | 1          | 1           |                 |
| 3   | Southern forest-steppe | 102              | 67            | 21            | 6         | 2         | 2         | 3          | 4           |                 |
| 4   | Steppe region       | 95                   | 51            | 24            | 6         | 1         | 5         | 5          | 2           | 3               |

The predominance of renting in agricultural land use is a necessary measure but it has a number of negative consequences. They are as follows:

- lease of land leads to the diversion of significant financial resources from the sphere of agricultural production (up to 1.5 billion rubles per year);
- it significantly reduces the stability of agricultural production, especially in case of renting for less than 1 year;
- it causes difficulties in the long-term planning of the agricultural business.
The majority of economic entities in the region do not own land (table 4). At the same time, in the northern zone, no agricultural organization owns land. In the southern zones, about 40% of households own small areas. And only about 30 organizations are engaged in production on significant areas of their land. This creates instability of land use, in connection with this and production itself. In the absence of land ownership, the value and therefore the attractiveness of the agricultural business for the investor is sharply reduced. The largest land owner in the Omsk region is OOO Niva of Pavlogradsky district (43.5 thousand hectares).

Table 5. Quality assessment of agricultural land by regions

| District            | Zone                | Soil bonitet | Technological properties | Location |
|---------------------|---------------------|--------------|--------------------------|----------|
| Kolosovsky          | Northern forest-steppe | 41.3         | 1.18                     | 62.6     |
| Nazyvaevsky         | Northern forest-steppe | 43.8         | 1.35                     | 46.9     |
| Tyukalinsky         | Northern forest-steppe | 47.9         | 1.22                     | 50.8     |
| Krutinsky           | Northern forest-steppe | 49.5         | 1.24                     | 45.2     |
| Tevrizisky          | North zone          | 49.6         | 1.26                     | 37.8     |
| Tarasy              | North zone          | 51.8         | 1.23                     | 77.3     |
| Ust-Ishimsky        | North zone          | 53.0         | 1.24                     | 49.9     |
| Sedelnikovsky       | North zone          | 53.1         | 1.38                     | 45.8     |
| Znamensky           | North zone          | 53.9         | 1.20                     | 48.3     |
| Bolsheukovsky       | North zone          | 54.8         | 1.25                     | 73.1     |
| Cherlaksky          | Steppe zone         | 56.8         | 1.09                     | 30.1     |
| Okoneshmikovsky     | Steppe zone         | 59.1         | 1.20                     | 58.0     |
| Bolsherechensky     | Northern forest-steppe | 59.3         | 1.25                     | 58.6     |
| Lubinsky            | Southern forest-steppe | 59.6         | 1.24                     | 37.8     |
| Gorkovsky           | Northern forest-steppe | 60.3         | 1.24                     | 47.5     |
| Muromtsevsky        | Northern forest-steppe | 61.0         | 1.19                     | 52.2     |
| Sargatsky           | Northern forest-steppe | 61.1         | 1.25                     | 46.0     |
| Novovarshavsky      | Steppe zone         | 65.5         | 1.10                     | 57.3     |
| Russian-Polyansky   | Steppe zone         | 67.4         | 1.10                     | 47.5     |
| Pavlogradsky        | Steppe zone         | 67.7         | 1.08                     | 32.1     |
| Tavrichesky         | Steppe zone         | 69.9         | 1.14                     | 47.3     |
| Kormilovka          | Southern forest-steppe | 71.1         | 1.18                     | 44.3     |
| Kalachinsky         | Southern forest-steppe | 71.1         | 1.17                     | 29.2     |
| Moskalensky         | Southern forest-steppe | 71.3         | 1.14                     | 40.3     |
| Omsky               | Southern forest-steppe | 72.4         | 1.19                     | 38.5     |
| Nizhneomsky         | Northern forest-steppe | 72.8         | 1.22                     | 40.1     |
| Poltavsky           | Steppe zone         | 73.5         | 1.08                     | 67.6     |
| Shcherbakulsky      | Steppe zone         | 74.3         | 1.11                     | 53.3     |
| Isilkulsky          | Southern forest-steppe | 74.8         | 1.13                     | 44.9     |
| Odessky             | Steppe zone         | 75.0         | 1.04                     | 40.0     |
| Azovsky             | Southern forest-steppe | 79.8         | 1.18                     | 61.4     |
| Maryanovsky         | Southern forest-steppe | 90.7         | 1.13                     | 38.7     |

The quality of land used is important for efficient agricultural production. It actually determines the production potential of land resources along with the size of the land.

The main parameters that determine the potential of the earth include:
- bonitet score, which largely determines the yield of agricultural crops;
- the technological properties of land (contouring, relief, soil energy intensity and composition)
affect a significant share of production costs in the cultivation of crops;
- the location of the land relative to the production centers (equivalent distance), affecting the amount of transport costs.

Table 6. Index assessment of land use potential

| District                | Zone                | Soil bonitet level indices | Technological properties | Location | Land potential |
|------------------------|---------------------|---------------------------|--------------------------|----------|----------------|
| low                    |                     |                           |                          |          |                |
| Tarsky                 | North zone          | 1                         | 2                        | 1        | 4              |
| Bolsheukovsky          | North zone          | 2                         | 2                        | 1        | 5              |
| Kolosovsky             | Northern forest-steppe | 1                      | 3                        | 1        | 5              |
| Nazyvaevsky            | Northern forest-steppe | 1                      | 1                        | 3        | 5              |
| Tyukalinsky            | Northern forest-steppe | 1                      | 2                        | 2        | 5              |
| Bolsherechensky        | Northern forest-steppe | 2                      | 2                        | 2        | 6              |
| Krutinsky              | Northern forest-steppe | 1                      | 2                        | 3        | 6              |
| Okoneshnikovsky        | Steppe zone         | 2                         | 2                        | 2        | 6              |
| Sedelnikovsky          | North zone          | 2                         | 1                        | 3        | 6              |
| average                |                     |                           |                          |          |                |
| Znamensky              | North zone          | 2                         | 2                        | 3        | 7              |
| Tevriziansky           | North zone          | 1                         | 2                        | 4        | 7              |
| Ust-Ishimsky           | North zone          | 2                         | 2                        | 3        | 7              |
| Azovskiy               | Southern forest-steppe | 4                      | 3                        | 1        | 8              |
| Gorkovsky              | Northern forest-steppe | 3                      | 3                        | 2        | 8              |
| Lubinsky               | Southern forest-steppe | 2                      | 2                        | 4        | 8              |
| Muromtsevsky           | Northern forest-steppe | 3                      | 3                        | 2        | 8              |
| Sargatsky              | Northern forest-steppe | 3                      | 2                        | 3        | 8              |
| Nizhneomskovsky        | Northern forest-steppe | 4                      | 2                        | 3        | 9              |
| Novovarshavsky         | Steppe zone         | 3                         | 4                        | 2        | 9              |
| Poltavsky              | Steppe zone         | 4                         | 4                        | 1        | 9              |
| Shcherbakulsky         | Steppe zone         | 4                         | 3                        | 2        | 9              |
| high                   |                     |                           |                          |          |                |
| Isilkulsly             | Southern forest-steppe | 4                      | 3                        | 3        | 10             |
| Kormilovka             | Southern forest-steppe | 4                      | 3                        | 3        | 10             |
| Odessky                | Steppe zone         | 4                         | 4                        | 2        | 10             |
| Russian-Polyansky      | Steppe zone         | 3                         | 4                        | 3        | 10             |
| Tavrichesky            | Steppe zone         | 3                         | 4                        | 3        | 10             |
| Cherlaksky             | Steppe zone         | 2                         | 4                        | 4        | 10             |
| Kalachinsky            | Southern forest-steppe | 4                      | 3                        | 4        | 11             |
| Maryanovsky            | Southern forest-steppe | 4                      | 3                        | 4        | 11             |
| Moskalensky            | Southern forest-steppe | 4                      | 3                        | 4        | 11             |
| Omsky                  | Southern forest-steppe | 4                      | 3                        | 4        | 11             |
| Pavlogradsky           | Steppe zone         | 3                         | 4                        | 4        | 11             |

Based on the materials of the cadastral valuation of lands, an index assessment of the production potential of lands in the regions was conducted.

The above data (table 5) demonstrate the significant differences in the potential productivity of arable land (almost 2 times). With regards to this indicator the districts are combined into 4 groups, with a difference between the groups of 10 points. Although in general the pattern is observed in the higher fertility of the southern regions than the northern ones. However, there is an exception:
Okoneshnikovsky and Lubinsky districts fell into group 2 due to significant areas of the solonetzic complex (table 6).

The best technological properties of the steppe and a significant part of the southern forest-steppe zone are explained by the lack of small contour of croplands and the lighter granulometric composition of soils. The differences lay in technological properties, which means that production costs are large and reach 30%.

Differences in the quality of land location relative to production centers are explained by the existing system of resettlement and the specific gravity of arable land in the structure of the entire land area. Therefore, land use in the southern forest-steppe zone was in a more privileged position. Therefore, transport costs differ by region more than 2 times and as for farms they differ even more. The totality of the analyzed parameters of agricultural land use shows a different level of starting conditions for agricultural production. This assessment shows trends in land use status of the area.

4. Analysis of land use efficiency in the basic districts of the region

Consistent with the influence of land use parameters on the results of economic activity, an analysis with regards to individual agricultural organizations was carried out. It showed even greater fluctuations in land use potential.

| New economy        | Cropland, ha | Bonitet point | Estimated cost index | Equivalent distance | Estimated rental income, rub/ha |
|-------------------|--------------|---------------|----------------------|---------------------|---------------------------------|
| SEC Koltyuginsky  | 3100.0       | 71            | 1.21                 | 37                  | 469                             |
| SEC Ermakovsky    | 1502.0       | 44            | 1.15                 | 81                  | 26                              |
| SEC Nagornovsky   | 1930.0       | 55            | 1.21                 | 91                  | 74                              |
| OOO Crystal       | 2040.0       | 61            | 1.26                 | 71                  | 193                             |
| SEC Ozerny        | 2011.0       | 53            | 1.26                 | 71                  | 193                             |
| SEC Chekrushansky | 2107.0       | 57            | 1.16                 | 6                   | 333                             |
| SEC Litkovsky     | 2929.0       | 48            | 1.18                 | 175                 | 26                              |

Within the Tarsky district (table 7), the difference in revenue-generating factors (rents) is quite significant: according to the bonitet score it is up to 60%, according to the estimated costs index it is equal to 10% equivalent to a distance of 29 times. This leads to serious differences in the potential profitability of the land of district organizations (by 18 times).

| New economy    | Cropland, ha | Bonitet point | Estimated cost index | Equivalent distance | Estimated rental income, rub/ha |
|----------------|--------------|---------------|----------------------|---------------------|---------------------------------|
| OOO Niva       | 6798.0       | 43            | 1.15                 | 72                  | 79                              |
| SEC Stanichny  | 2950.0       | 50            | 1.23                 | 68                  | 171                             |
| OOO Alekseevskoe| 8756.0       | 65            | 1.23                 | 61                  | 435                             |
| SEC Krasnopolyansky-1 | 1554.0   | 46            | 1.23                 | 51                  | 143                             |
| OOO Sibir-Agro | 9913.0       | 55            | 1.17                 | 57                  | 302                             |
| OOO Kolos      | 10165.0      | 39            | 1.33                 | 68                  | 26                              |

Within the Gorky District (table 8), the situation with income generating factors (rents) is quite diverse: according to the bonitet score it is 66%, according to the estimated cost index it equals 14%, according to the equivalent distance it is 40%. This leads to serious differences in the potential profitability of land by agricultural organizations district (by 17 times).
Within the Isilkulsky region (table 9), the land quality is more even. The difference in income-generating factors (rent) is as follows: according to the bonitet score it is 7%, according to the estimated cost index it is 37%, according to the equivalent distance it is by 2.8 times. The maximum differences for the district organizations in the potential profitability of land are only 42%.

Table 9. Assessment of land potential by organizations of the Isilkulsky district (southern forest-steppe)

| New economy       | Cropland, ha  | Bonitet point | Estimated cost index | Equivalent distance | Estimated rental income, rub/ha |
|-------------------|---------------|---------------|----------------------|---------------------|---------------------------------|
| ZAO Novorozhdestvensky | 11791.0       | 80            | 1.47                 | 58                  | 788                             |
| JSK Solntsevo     | 12664.0       | 75            | 1.12                 | 34                  | 944                             |
| SEC Lesnoy        | 23585.0       | 80            | 1.1                  | 22                  | 1122                            |
| SEC Ukrainian     | 19955.0       | 73            | 1.1                  | 34                  | 906                             |
| FGUP Boyevoye     | 17875.0       | 70            | 1.12                 | 21                  | 863                             |

Table 10. Assessment of land potential by organizations of the Poltava region (steppe zone)

| New economy       | Cropland, ha  | Bonitet point | Estimated cost index | Equivalent distance | Estimated rental income, rub/ha |
|-------------------|---------------|---------------|----------------------|---------------------|---------------------------------|
| SEC Eremeevsky    | 12262,0       | 78            | 1.09                 | 61                  | 1024                            |
| SEC Bolshevik     | 29474,0       | 72            | 1.03                 | 91                  | 804                             |
| OOO Initiativa    | 1335,0        | 72            | 1.03                 | 91                  | 804                             |
| OOO Zernyshko     | 1349,0        | 89            | 1.04                 | 96                  | 1157                            |
| OOO Eremeevskoe   | 19914,0       | 78            | 1.09                 | 61                  | 1024                            |
| OOO Krasnogorskiy kholos | 16646,0 | 73            | 1.05                 | 64                  | 915                             |
| OOO Zolotaya Niva | 4360,0        | 86            | 1.05                 | 64                  | 1223                            |

The situation in the Poltavy region is similar to the Isilkulsky one. The difference in revenue-generating factors (rent) is not significant. Specifically, it is as follows: according to the bonitet score it is 23%, according to the estimated costs index it is 6%, according to the equivalent distance it is 57%. This leads to equalization of the potential land profitability, which differs by a maximum of 52% in the district organizations.

The analysis shows that the potential of the lands of the southern regions is much higher than of the northern ones. In SEK Ermakovsky (Tarsky district), the land potential is 47 times lower than in OOO Zolotaya Niva (southern forest-steppe).

In the southern zones, the land potential is more equivalent than in the northern ones. Differences in agricultural organizations reach 17 times in the Tarsky district and about 50% in the Poltavy region.

In addition to the initial potential of land resources, agricultural organizations form production potential, which is established on the basis of the aggregate quality of land (specific indicator of cadastral value), the availability of labor, fixed assets. To compare all factors, the production potential is assigned to land resources (labor supply, cost of fixed assets in crop production per 100 hectares of agricultural land) (Table 11).

The analysis shows that quite definitely the actual effective indicators are determined by the parameters of production potential, including the aggregate indicator of the quality of the used land resources.

The most efficient use of land is traditionally noted in the steppe zone and on a significant part of the southern forest-steppe one. Assessing the effectiveness of the use of land potential and other factors of production, we can say that their higher security determines the profitability of land use. However, the results of crop production could be more significant in the Taurichesky, Kormilovsky,
Sargatsky, Tarsky districts. They note the incomplete and not sufficiently effective use of land and production potential.

**Table 11.** Description of conditions and actual results of realizing land potential in agricultural organizations by districts of the Omsk region

| District        | Relative indicator of the cadastral value of a land plot (per hectar), thousand rubles/ha | Labor supply, people / 100 ha of agricultural land | Capital-labor ratio, thousand rubles / 100 ha of agricultural land | The cost of fixed assets in crop production per 100 hectares of agricultural land, thousand rubles | The cost of crop production per 100 ha of agricultural land, thousand rubles | Profit / loss, thousand rubles / 100 ha agricultural land | Profitability of production, % |
|-----------------|------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------|
| Odesskiy        | 48.2 0.4                                                                                 | 1195.0                                           | 474.5                                                         | 1624.9                                                                          | 1014.8                                                                          | 608.9                                                                          | 60                              |
| Pavlogradsky    | 38.6 0.5                                                                                 | 1205.7                                           | 474.5                                                         | 1624.9                                                                          | 1014.8                                                                          | 608.9                                                                          | 60                              |
| Poltavsky       | 37.4 0.5                                                                                 | 885.7                                            | 473.3                                                         | 953.2                                                                           | 335.3                                                                           | 317.7                                                                           | 50                              |
| Cherlaksky      | 37.4 0.5                                                                                 | 842.1                                            | 363.9                                                         | 860.9                                                                           | 508.0                                                                           | 278.8                                                                           | 48                              |
| Sherbakulsky    | 46.9 0.5                                                                                 | 789.3                                            | 363.9                                                         | 860.9                                                                           | 508.0                                                                           | 278.8                                                                           | 48                              |
| Okoneshnikovsky | 38.6 0.5                                                                                 | 806.6                                            | 387.5                                                         | 918.6                                                                           | 671.7                                                                           | 248.5                                                                           | 37                              |
| Pavlogradsky    | 38.6 0.5                                                                                 | 277.0                                            | 458.7                                                         | 703.9                                                                           | 551.7                                                                           | 154.5                                                                           | 28                              |
| Tavrichesky     | 48.9 0.3                                                                                 | 1324.1                                           | 460.4                                                         | 723.9                                                                           | 166.5                                                                           | 166.5                                                                           | 23                              |
| Russian-Polyansky| 27.4 0.6                                                                               | 1382.5                                           | 802.4                                                         | 517.9                                                                           | 98.3                                                                           | 19.3                                                                           | 19                              |
| Omsky           | 36.5 1.7                                                                                 | 967.5                                            | 514.2                                                         | 900.4                                                                           | 636.6                                                                           | 274.9                                                                           | 43                              |
| Kalachinsky     | 33.8 0.5                                                                                 | 1954.1                                           | 3310.8                                                        | 2237.7                                                                          | 1465.5                                                                          | 776.7                                                                           | 53                              |
| Isilkhulsky     | 32.2 0.8                                                                                 | 799.4                                            | 408.7                                                         | 975.9                                                                           | 703.5                                                                           | 274.4                                                                           | 39                              |
| Azovskiy district| 29.3 0.9                                                                                | 629.7                                            | 505.3                                                         | 1080.5                                                                          | 795.5                                                                           | 286.4                                                                           | 36                              |
| Lubinsky        | 33.4 0.8                                                                                 | 1000.8                                           | 890.4                                                         | 1167.2                                                                          | 883.7                                                                           | 282.8                                                                           | 32                              |
| Maryanovsky     | 38.8 0.6                                                                                 | 614.0                                            | 514.5                                                         | 764.6                                                                           | 594.1                                                                           | 172.3                                                                           | 29                              |
| Kormilovsky     | 34.5 0.8                                                                                 | 4577.6                                           | 2251.3                                                        | 883.7                                                                           | 172.3                                                                           | 594.1                                                                           | 172.3                           | 29                              |
| southern forest-steppe | 34.5 0.8                               | 1483.6                                           | 1253.0                                                        | 1159.4                                                                          | 844.0                                                                           | 282.5                                                                           | 33                              |
| Krutinsky       | 6.9 1.0                                                                                  | 513.1                                            | 533.1                                                         | 560.1                                                                           | 409.9                                                                           | 151.7                                                                           | 37                              |
| Gorkovsky       | 8.9 0.3                                                                                  | 607.0                                            | 204.0                                                         | 642.8                                                                           | 513.3                                                                           | 128.3                                                                           | 25                              |
| Nizhnevomsky    | 8.6 1.0                                                                                  | 147.2                                            | 142.1                                                         | 621.8                                                                           | 577.6                                                                           | 46.2                                                                           | 8                               |
| Kolosovskiy     | 6.7 0.6                                                                                  | 478.8                                            | 30.9                                                         | 39.8                                                                           | 37.2                                                                           | 26.6                                                                           | 7                               |
| Nazyvaevsky     | 6.2 0.2                                                                                  | 779.4                                            | 184.9                                                         | 388.3                                                                           | 37.0                                                                           | 37.0                                                                           | 5                               |
| Tyukalinsky     | 4.0 0.2                                                                                  | 646.2                                            | 122.2                                                         | 229.2                                                                           | 227.7                                                                           | 2.3                                                                           | 1                               |
| Bolsherechensky | 8.0 0.4                                                                                  | 697.3                                            | 271.8                                                         | 370.6                                                                           | 370.6                                                                           | -9.4                                                                           | -                               |
| Muromtsevsky    | 5.5 0.4                                                                                  | 676.4                                            | 281.6                                                         | 317.8                                                                           | 344.9                                                                           | -52.5                                                                           | -                               |
| Sargatsky       | 8.8 1.5                                                                                  | 243.7                                            | 360.6                                                         | 546.8                                                                           | 553.2                                                                           | -6.9                                                                           | -                               |
| northern forest-steppe | 7.1 0.6                               | 484.2                                            | 238.2                                                         | 405.8                                                                           | 371.2                                                                           | 34.2                                                                           | 9                               |
| Bolshchevsky    | 3.2 0.1                                                                                  | 330.8                                            | 19.8                                                         | 21.5                                                                           | 18.5                                                                           | 3.0                                                                           | 16                              |
| Ust-Ishinsky    | 5.7 1.1                                                                                  | 351.4                                            | 375.5                                                         | 322.2                                                                           | 287.1                                                                           | 34.5                                                                           | 12                              |
| Sedelnikovsky   | 4.2 0.5                                                                                  | 624.9                                            | 322.0                                                         | 226.3                                                                           | 208.0                                                                           | 18.7                                                                           | 9                               |
| Tarsky          | 3.6 0.8                                                                                  | 435.7                                            | 361.0                                                         | 396.3                                                                           | 391.7                                                                           | 3.9                                                                           | 1                               |
| Znamensky       | 6.5 1.0                                                                                  | 95.6                                             | 94.2                                                         | 285.0                                                                           | 294.2                                                                           | -7.4                                                                           | -                               |
| Tevrizsky       | 5.7 0.9                                                                                  | 10.4                                             | 8.9                                                         | 113.5                                                                           | 123.0                                                                           | -9.9                                                                           | -                               |
| northern zone   | 4.8 0.7                                                                                  | 308.1                                            | 196.9                                                         | 10.8                                                                           | 220.4                                                                           | 7.1                                                                           | 3                               |
| By area         | 21.5 0.7                                                                                 | 810.9                                            | 344.5                                                         | 673.3                                                                           | 518.1                                                                           | 155.2                                                                           | 29                              |
5. Conclusion
1. The analysis showed a significant difference in the potential of land resources not only in zones and districts but also in larger sizes for agricultural organizations. This indicates the need to take into account the differences in land properties when planning the development of agricultural production and implementing business projects.

2. In accordance with the differences in land potential, it is necessary to develop a program to smooth them out and establish subsidies for equalizing the starting land use conditions.

3. Land lease is a necessary measure but its provision has a number of negative consequences. They are as follows:
   - lease of land leads to the diversion of significant financial resources from the sphere of agricultural production (up to 1.5 million rubles per year);
   - it significantly reduces the stability of agricultural production, especially when renting up to 1 year;
   - causes difficulties in the long-term planning of the agricultural business;
   - necessary to stimulate the transformation of rental land use into the own land use.

4. The lack of land ownership reduces the value of the property complex of agricultural organizations, which leads to the following consequences:
   - a sharp decrease in the attractiveness of the agricultural business for investors;
   - limited creditability of organizations.

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