Application of digital technologies in agricultural production in Siberian federal district regions

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Abstract. The article analyzes the agricultural production volume, the number of rural population in Siberian Federal District regions for 2019, presents technical and technological equipment with computers and telecommunications, shows the need for the introduction of digital technologies that contribute to improving the efficiency of agriculture

The Siberian Federal District accounts for 25.5% of the Russia territory and includes ten regions. The agro-industrial complex is one of the leading sectors of the district, which is the largest food producer in the east of the country. Various natural-climatic, socio-economic and other conditions in the subjects of the Siberian Federal District, significant differences in resource potential and level of socio-economic development affect the state of agricultural production and determine the specifics of each region.

In 2019 the district ranked fourth among the Russian Federation regions in terms of agricultural production. At the same time, the largest volume of agricultural production was in the Altai Territory due to favorable climatic conditions, the availability of agricultural land and the size of the rural population. Similar conditions for farming in the Omsk and Novosibirsk regions, located in second and third places, respectively (table 1).

Table 1. Volumes of agricultural production and the number of rural population in the Siberian Federal District regions, 2019.

| Subjects of the Russian Federation | Agricultural production in actual prices, million rubles [1] | The share of regions in agricultural production in the Siberian Federal District | Rural population, 01.01.19, people [2] | Rural population, % of the Siberian Federal District |
|-----------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------|-------------------------------------------------|
| Siberian Federal District         | 591447                                                      | 100.0                                                          | 4 412 899                                | 100.0                                           |
| Republic of Altai                | 10646                                                       | 1.8                                                            | 155 021                                  | 3.5                                             |
| Republic of Tyva                 | 6388                                                        | 1.1                                                            | 148 960                                  | 3.4                                             |
| Republic of Khakassia            | 13626                                                       | 2.3                                                            | 162 614                                  | 4.0                                             |
| Altai Territory                  | 144540                                                      | 24.4                                                           | 1 010 199                                | 22.3                                            |
| Krasnoyarsk Territory            | 84865                                                       | 14.4                                                           | 645 046                                  | 14.6                                            |

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Currently, in the conditions of increasing food demand, the agro-industrial complex of the Siberian Federal District occupies a significant place in providing the population with food. The dynamic development of agricultural production requires the introduction of a highly efficient agricultural system, modern technologies for collecting and processing information necessary to solve numerous production and management problems [3].

The active introduction of digital technologies contributes to increasing the agriculture efficiency, reducing the production cost, attracting specialists of new professions to the industry and improving the standard of living in the village, so the problem of technical and technological equipment in the regions with computer and telecommunications equipment becomes especially relevant (table 2).

**Table 2. Technical and technological equipment by means of computers and telecommunications in the Siberian Federal District regions, 2019.**

| Subjects of the Russian Federation | The number of personal computers in organizations | Organizations using special software, % of the total number of surveyed organizations | The share of organizations with a website on the Internet, in the total number of organizations, % | Number of connected subscriber devices for mobile communications per 1000 people, units |
|-----------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Total for 100 employees | With Internet access for 100 employees | | | |
| Siberian Federal District | 49 | 35 | 20.9 | 84.3 | 1887.0 |
| Republic of Altai | 59 | 39 | 8.0 | 90.5 | 1465.7 |
| Republic of Tyva | 52 | 35 | 5.3 | 74.5 | 1369.8 |
| Republic of Khakassia | 50 | 35 | 13.2 | 81.6 | 2106.1 |
| Altai Territory | 44 | 32 | 18.6 | 90.0 | 1719.1 |
| Krasnoyarsk Territory | 48 | 34 | 16.9 | 84.5 | 1853.8 |
| Irkutsk Region | 48 | 34 | 20.2 | 79.2 | 1995.5 |
| Kemerovo Region | 38 | 27 | 18.8 | 87.6 | 1802.1 |
| Novosibirsk Region | 59 | 44 | 37.5 | 85.7 | 2076.6 |
| Omsk Region | 50 | 34 | 16.0 | 83.3 | 1959.8 |
| Tomsk Region | 62 | 46 | 19.8 | 80.6 | 1816.9 |

Thus, the largest number of personal computers per 100 employees in organizations of the Siberian Federal District regions in the Tomsk, Novosibirsk regions and in the Altai Republic. Most likely, this is due to the difference in funding for the acquisition of office equipment. The same situation in the number of personal computers per 100 employees with access to the Internet. Differences in this indicator can be due to both different tariffs for Internet access services and the general level of region development.
The Altai Republic and the Altai Territory have the best percentage of organizations that have a website on the Internet in the total number of organizations. In the Novosibirsk and Irkutsk regions, the most organizations that used special software tools.

According to the number of connected subscriber mobile communication devices per 1000 people of the population, the best situation in the Republic of Khakassia, Novosibirsk Region, worse - in the Republics of Tuva and Altai.

The introduction of digital technologies into the agro-industrial complex leads to a reduction in costs, productivity and labor efficiency are increased several times, so for modern agro-industrial complex it is necessary to take advantage of the achievements of scientific progress. The growing demand for food products requires active promotion of digitalization in all regions of the Siberian Federal District. For example, because of digital technologies introduction in the agro-industrial complex of the Novosibirsk region, 125 farms use elements of precision farming on an area of 797.4 thousand hectares (34.4% of the sown area), elements of precision farming are used by 27 farms with a livestock of 92,833 heads (coverage of 26.5% ) [5].

But the introduction of digital technologies in rural areas often presents certain problems: the share of the rural population is declining, there is no infrastructure in the villages, including basic IT infrastructure, and there is a lack of certain technical knowledge and skills. To increase the efficiency and competitiveness of agribusiness, it is necessary to synthesize scientific developments with practical agricultural production.

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