

THE INCREASE THE FERTILITY OF AGRICULTURAL LAND AND MONITORING OF THIS LAND ARE THE NECESSARY CONDITIONS FOR ENSURING FOOD SECURITY

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ABSTRACT

The availability of suitable land for agricultural activities and the quality of this land are the main factors determining the maximum number of the population of the planet. In the Russian Federation is 8.9 % of the world's arable land. But the natural-climatic conditions of Russia are rather complicated from the point of view of agricultural production. Therefore, the special significance is having the land reclamation and the measures of enhance soil fertility. Meanwhile, the share of reclaimed land in Russia is much lower than by our competitors in the global food market. From 2014 the state is starting the realization of the Federal target program of land reclamation agricultural purposes. The information systems about the land in the period of the agrarian and land transformation and development of a market turnover of land (including agricultural) were attending more of legal aspects and of technical side (technology, electronic information exchange) rather than on the characteristics of the land as the main means of production. Currently agricultural producers are demanding the land information. But the modern systems, containing information on agricultural lands, are not enough characterizing this land as a productive resource. It is negatively affects the development of agriculture. Now the Ministry of agriculture of Russia develops the proposals on establishment of a special system of monitoring agricultural lands. However, this system is created very slowly.

KEYWORDS

Agricultural land; Land melioration; Food security; Monitoring of land; Cadaster; Federal target program.

The land resources are main means of agricultural production. Moreover, rapid population growth (globally) has resulted to that the availability of suitable land for agricultural activities and the quality of this land are the main factors determining the maximum number of population on the planet (*Piterskij, 1999*).

The global stocks of agricultural land are today approximately 5 billion hectares, of which the most valuable lands arable lands - 1.4 billion hectares. The arable land in the Russian Federation is 8.9% of the world's stocks. Therefore land resources which suited for agricultural production are an important factor in the competitiveness of our country.

However, the climatic conditions in Russia are rather complicated from the point of view of agricultural production. So, the wind and water erosion, salinization, desertification and other types of land degradation are worsening the condition of large areas agricultural lands. The 80% of arable land is characteristic the deficit of precipitation. The 10% of arable lands are as excessive over-moistening. Over the past 20-25 years the depletion of the soil, especially the arable land, happened; now more than 56 million hectares of arable lands are characterized by the low humus content (*Lipski, 2013*).

METHODOLOGY AND MATERIALS

The author collected and analysed the materials on this topic during all period of land reform in modern Russia (he began this in late 80-s). The main methodological way is adopted system approach, which is providing the maximum possible the account of all aspects of the problem. Also author used statistics, abstract-logical and historical methods. The materials for this research were normative legal acts, official and other reports and works of other scientists of the Soviet and modern periods. To a certain extent, the findings

and results are based on the experience of the author (more than 20 years he was directly involved in preparing the relevant decisions and their correction).

MEASURES TO INCREASE OF THE SOIL FERTILITY

In 2010, the President of the Russian Federation approved the Doctrine of food security. It has determined that the weight of domestic agricultural products and foodstuffs in the total volume of commodity resources of the internal market must be not less than 95% for grains, 85% for meat, 90% for milk, 80% for sugar, 80% for vegetable oils and 95% for potato.

This cannot be achieved without the optimization of land use. Therefore, the state economic policy in the sphere of food security includes the organization of a more rational use of agricultural lands. This is the increase of soil fertility, the expansion of sowing of agricultural crops at the expense of unused arable lands; also it is construction and reconstruction of drainage systems.

Thus, the yield on irrigated lands is in the three to four times higher compared with other land; and the labor productivity is in the two to three times (*reports, 2010-2012*). The advantage of irrigated farming is most clearly manifested in the conditions of the abnormal drought 2010. Then the crops completely died almost a third of the area of crops in more than 40 regions of the Russian Federation. More than 25 thousand farms have suffered losses. The grain production in that year decreased by 35%, the shortage of grain amounted to 15 million tons, vegetables - 1.9 million tons. In the same time, the yield on irrigated land decreased only 10-12%.

Meanwhile, the share of reclaimed land in Russia is less than 8%. This is unacceptable lower than of our competitors in the global food market. For example, in China the reclaimed land is 44%, in India - 36%, in the USA - 40% (*federal target program, 2013*).

And even drainage systems created in the Soviet period, in many cases, are using improperly. So, almost half of agricultural irrigation systems of general and individual used is not operated because they have any malfunctions and other reasons. Now more than 500 thousand hectares of irrigated lands are not used in agricultural production.

As a result, if in the early 90-s in the Russian Federation there were 11.5 million hectares of reclaimed agricultural land (6.1 million hectares of irrigated and 5.4 million hectares of drained land), then to the present time only 9.1 million hectares of reclaimed land (4.3 million irrigated and 4.8 million drained) are in the use of agricultural producers. This was largely the result of inadequate measures of the state support of agrarian sector in a very difficult period of the active phase of agrarian and land reforms (the 90-s and the beginning of «zero's» years). In this period the termination use more than 15 million hectares of agricultural lands happened. The mineral and organic fertilizers then were not compensating for the loss of nutrients soil with harvest - the average annual deficit of humus in arable layer amounted to 0.52 tons per hectare.

However, the beginning of realization in 2006 of the priority national project «Development of agro-industrial complex» helped improve the situation. Then this project was transformed into the state programs development of agriculture and regulation of market agricultural products, raw materials and food (2008-2012 and 2013-2020). Their implementation has given 4.4% annual growth of agricultural production. Moreover, it was in the conditions of 2010, when significant agricultural areas were covered by an abnormal drought.

In the same year the Government adopted program of soil fertility (*federal target program 2006*). Similar programs had implemented previously too. But they did not give the expected result. The program 2006 gave a positive effect.

So, it has allowed to involve in agricultural use 4.77 million hectares of unused an agricultural land and to prevent the outflow from use 6.79 million hectares.

The rehabilitation and involvement in intensive agricultural use 232.15 thousand hectares of land affected by the accident at the Chernobyl NPP had carried out in the framework of this program.

The program's events had provided the protection of 548.91 thousand hectares against water erosion, flooding and underflooding and of 1201.32 thousand hectares from wind erosion and desertification.

Only environmental benefits from the restoration and preservation of soil fertility on the square 6.79 million hectares of agricultural lands are estimated more than 25 billion rubles (*federal target program, 2013*).

An additional incentive for the movement in this direction should be the food security Doctrine of the Russian Federation, which provides for a more rational use of agricultural lands, increase soil fertility, expansion of sowing agricultural crops at the expense of unused arable land (*Lipski, 2013*).

A new step was the decision of the Government of the Russian Federation about Federal target program «Development of melioration of the agricultural lands of Russia for 2014-2020».

MONITORING OF AGRICULTURAL LAND

Another necessary condition for the rational use and protection of agricultural land is appropriate information support.

In Soviet period and in beginning of land reform the state land cadaster was main information system, which contained the information about land. It included the following components.

1. The registration of specific land plots reflected the legal aspects of land use.
2. The accounting of the quantity and quality of land.
3. The soil's bonitation by natural properties was reflecting the production aspects of land use.
4. The economic evaluation of land was the basis for application of economic regulators of agricultural lands.

In the 90-s the land cadaster developed towards a multi-purpose information system about land which included the accounting of land, her registration, ensuring of land's taxation and land's management. Then cadastral specialists tried to integrate in this system other real estate. But it was unsuccessfully (*Lipski, 2001*). It succeeded after the adoption in the 2007 law about the transition to the united cadaster of real estate. In result the data of agricultural land were greatly simplified. Real estate cadaster contains no information about farmland in the structure of land plot, about productive specifications and other information. Therefore this cadaster is not suitable for the purposes ensure of rational use of agricultural land. It is not reflecting the specifics of land as a natural resource used as the main means of production in agriculture (*Hlystun, 2010*).

In the early 90-s another the land information system was introduced in addition to land cadaster. It is the state monitoring of lands, which became a part of the state environmental monitoring.

However, it also ensures not full-fledged observation for land plots as for production resource and for fields of crop rotation. This monitoring is not exercised for a range of parameters characterizing the fertility of the soils, which are essential for agriculture.

Along with the state monitoring of land the other observations are being implemented in the land and agrarian spheres too.

The monitoring of fertility of agricultural lands is part of the state monitoring of land (more *Zakharova, 2012*). Also the state monitoring of land includes as a component part the monitoring of reclaimed land.

The Doctrine of food security of the Russian Federation provides for the monitoring such security. One of the main directions of the ensuring of food security is the increase soil fertility and crop yield, the expansion of sowing of agricultural crops at the expense of unused arable lands, the construction and reconstruction of drainage systems (more *Lipski, 2013*).

Thus, for the lands of agricultural purpose there are several types of observations. But these disparate observations do not give a synergy effect. There is the lack of systematic. In

this regard, quite big expectations are connected with the formation unified system of monitoring agricultural land.

In 2010 the Government of the Russian Federation approved the concept of the development of the specialized state monitoring agricultural lands and of the formation of state information resources about these lands.

The practical steps on conducting this monitoring was not realized although after the adoption of the respective decision by the Government of the Russian Federation has passed already more than 3 years. So, the information resources in the field of monitoring agricultural lands created while only in 4 regions (Voronezh, Samara, Lipetsk region, Krasnodar territory). The works on their formation started in 15 other regions.

The basis for the formation of such a system should be implemented in the real time monitoring of soil fertility. The centers and stations of the agrochemical service, chemicals and agricultural radiology perform this monitoring. This centers and stations are subordinate to the Ministry of agriculture of Russia.

This centers and stations along with directly monitoring of land fertility have as the main directions of activities the soil, agrochemical, phytosanitary, ecological and toxicological surveys of agricultural land. Also they are performing the reclamation and erosion control measures in order to ensure the reproduction of fertility of lands, including conservation heavily eroded lands. Therefore, the monitoring of agricultural lands can provide the necessary consistency in the information sphere of agrarian land.

DISCUSSION

This article generalizes and systematizes the results published by its author in various scientific editions (*Lipski, 2001, 2013* and other). The responses on them received from a number scientists and specialists.

CONCLUSION

The general conclusion is that in the period of agrarian and land reforms the state was not able to allocate sufficient funds for improve the fertility. The agricultural organizations also do not have adequate funds for the financing of such works and for the purchase informations about their lands. The information systems about the land in that period were attending more of legal aspects and of technical side (technology, electronic information exchange) rather than on the characteristics of the land as the main means of production. Currently the situation is improving. The agricultural producers are demanding the land information.

Currently the preservation and increase of fertility of agricultural land are requiring systematic work. Besides, along with measures of legislative regulation and budget financing the agricultural science should be engaging of the solution of this problem. The adoption of the program of land reclamation was the result of purposeful work of scientists and specialists. But if the scientific community is not able to formulate its position on the existing problematic issues, such issues will be solved authoritarian (as it happened in land and agrarian sphere in period of reform).

REFERENCES

1. Doklady o sostojanii i ispol'zovanii zemel' sel'skohozejstvennogo naznachenija. [Reports on the status and use of lands of agricultural purpose]. Moscow. 2010-2012.
2. Federal target program «Development of melioration of the agricultural lands of Russia for 2014-2020». Collection of legislation of the Russian Federation. 2013. (43), 5554
3. Federal target program «Preservation and restoration of fertility of agricultural lands and agricultural landscapes as the national heritage of Russia for 2006 - 2010 years». Collection of legislation of the Russian Federation. 2006. (10), 1101.

4. Hlystun, V.N. (2010) Needs whether the country in a land cadaster? Land use planning, cadaster and land monitoring. (7), P. 34-36.
5. Kruzhilin, I.P. (2009). About the Concept of the target program for development of land reclamation with respect to implementation of requirements of food security Doctrine of the Russian Federation. Use and protection of natural resources in Russia. (2) P. 51-57.
6. Lipski, S.A. (2001). Development of cadaster and land monitoring. Agrarian science. (4). P. 6-7.
7. Lipski, S.A. (2013). Rational use of agricultural land as a major factor of the ensuring food security. Land use planning, cadaster and land monitoring. (3), P. 15-20.
8. Lipski, S.A. (2013). State policy to ensure soil fertility in post-Soviet Russia. Agrarian Russia. (11). 25-29.
9. Piterskij, V.M. Strategicheskij potencial Rossii. Prirodnye resursy. [Strategic potential of Russia. Natural resources.]. Moscow. 1999. 252 p.
10. Pravovye problemy racional'nogo ispol'zovanija i oborota zemel' sel'skohozjajstvennogo naznachenija. [Legal problems of rational use and turnover of agricultural lands]. Monography. Edited by Lipski, S.A. Moscow. 2013. 120 p.
11. Volkov, S.N. (2009). Management of agricultural lands. Land use planning. Agrarian herald of the Urals. (5). P. 13- 17.
12. Zaharova, N.I. (2012). Monitoring of soils of agricultural lands: the essence, goals and objectives. Bulletin of Povolzhskaya academy of state service. P. 117-121.