Creation of the Chkalovsky Agro(bio)technopark in order to realize the agricultural potential of the technical university

Timur Papaskiri¹, Stanislav Lipski¹*, and Ekaterina Ananicheva¹

¹Federal State Budgetary Educational Institution of Higher Education "State University of Land Management", Moscow, Russia

Abstract. The article analyzes how a modern engineering university, part of the system of agricultural universities, will be able to realize its agricultural potential. The main direction for this, the authors see, is the creation of an Agro(bio)technopark of the same name on the basis of the Chkalovsky geodetic testing area. As part of the scientific work, the main directions of its activities, current tasks for creation are presented, and it is also indicated what place this strategic university project will take among these currently implemented projects, to what extent it has been worked out and justified from an economic point of view.

1 Introduction

The need to reliably ensure the country's food security [5] poses the task of the agro-industrial complex, as well as other sectors of the economy, to find opportunities to implement innovative development models and intensify their implementation [4, 6, 11]. Moreover, this area represents a whole set of industries. Therefore, solving food safety issues requires not only the development of advanced breakthrough technologies, but linking them with the organization of production, conducting scientific experiments, preserving agricultural landscapes while simultaneously expanding the areas for exhibiting the results obtained. Finally, it is very important to train specialists of relevant competence who are in demand at the professional level - university graduates [3, 12]. The status of an Agro(bio)technopark allows us to fully take into account these requirements, which includes a number of mandatory clusters: production (growing products and their primary processing), experimental (laboratories, experimental sites), recreational (park landscape, place for organizing exhibition activities) and educational, which also gives a new impetus to the corresponding university - the opening of fundamentally new laboratories, educational facilities, production bases and training grounds, as well as scientific and infrastructural renovation of existing ones.

The University of Land Management (GUZ) is a major university in the country, a center of education and science in the field of land management, cadastres and real estate registration. This is a traditional technical (engineering) university, at the same time part of

* Corresponding author: lipski-sa@yandex.ru
the system of agricultural universities (one of three agricultural universities in Moscow; therefore, most of the areas of training are not agricultural, but universal in nature - specific to the city). Its current state and development reflect the general state and development of the Russian education system and, at the same time, are associated with the specifics of its activities in the field of rational use of land resources.

Already, the University of Land Management is a recognized leading innovative center in the field of science and education, responding to modern demands of the labor market and integrated into the agro-industrial sector of the economy and the service sector in the field of rational land use, information support for the real estate cadastre, which will correspond to scientific research trends in this area [8, 14]. In accordance with the Strategic Development Program of the University for Land Management, designed for 2022-2030 [7], its strategic goal is to join the group of systemically important industry universities - world leaders in training personnel for land management and cadastres. At the same time, one of the key tasks to achieve this goal is the development and improvement of “modern material and technical base, instrumentation and the availability of test sites for the development and testing of new technologies for obtaining, processing and disseminating topographic-geodetic, planning-cartographic, monitoring and other information”.

Therefore, the innovative model of development of the State University is based on knowledge-intensive, practice-oriented and, at the same time, strategic university projects linked to the educational process. The scientific developments on which they are based have been carried out and published for several years in a row [9-10], but their design in the form of projects and, moreover, practical implementation - all this began in 2022-2023. These are the projects “Farmland Boundaries” (University scientists developed a method for establishing them for the whole country on the instructions of the Federal Ministry of Agriculture), “Carbon Land Management”, “Village-2030”, “Russian Estate”, etc.

But the key of these projects, which is most relevant to the integration of the scientific developments and educational process available at the University, is the Chkalovsky Agro(bio)technopark project, aimed at creating a unique infrastructure complex intended for the placement and operation on its territory of innovative companies and organizations whose activities is aimed at the development and production of high-tech products, commercialization of existing scientific developments, creation of systemic conditions for harmonizing the activities of the University in the fields of education, science, production, training and training. In addition, this strategic project develops to the greatest extent the agricultural component of the University, and it will be implemented in rural areas (in the Moscow region), and not in Moscow, where the main university complex is located.

2 Materials and methods

The article uses abstract-logical, statistical, monographic and historical methods.

3 Results and Discussion

The Chkalovsky Agro(bio)technopark project, taking into account the scientific basis for its implementation, its scale and scope, is key among other strategic land management projects of the University. This project simultaneously:

- Develops and generalizes the previously completed work of University scientists [1-2, 14].
- Takes into account modern problems, needs and opportunities in knowledge-intensive agro(bio)technospheres (new challenges in the field of food security; prospects for scientific and industrial developments and technologies - city farming, lighting
technology in protected soil crop production, organic and carbon farming, BVS and widely scalable their application in a variety of fields, the capabilities of artificial intelligence, etc.).

- Is closely linked with current R&D, carried out both under the state order of the Ministry of Agriculture of Russia, and as ground developments supported by the Russian Academy of Sciences, the Russian Science Foundation and other scientific and production funds.

- Meets the needs of the changing labor market and applicants and students of all levels of training oriented towards it (bachelors, masters, graduate students), in particular, its scientific, material and technical base will allow them to master competencies in the areas of piloting UAVs and processing data received from them, growing crops in multi-tier city farms and running-in of the resulting products.

- Most fully corresponds to the integration of university science and teaching, as well as the University’s production partners closely related to them.

Based on previously formed trends, new opportunities that have opened up, as well as promising, breakthrough technologies in the domestic agro-industrial complex for the next 5-6 years, the Chkalovsky Agro(bio)technopark will develop as a complex of interconnected clusters (other research and production areas are possible in the future):

- An educational cluster that has existed since 1963 in the form of a training and production geodetic site and its housing and amenities infrastructure (living houses, canteen, etc.). Over the past year or two, this cluster has already received a qualitatively new development in the form of a reference linear basis, reconstructed residential buildings, in the future, along with geodetic, soil science, agronomic and forestry components will be developed here, in particular, students will undergo practical training here as already existing ones (“Ecology and environmental management" and "Landscape architecture"), as well as fundamentally new educational profiles "Cadastral activities", "Protected soil engineer", "Forest restoration", "Regulation of land management and cadastral activities", "Judicial land management examination", "Digital technologies in geoecology and land management”, “Information support for spatial development” (the last two - in collaboration with the Federal State Budgetary Educational Institution of Higher Education “Financial University under the Government of the Russian Federation”, etc.

- The Sfera UAV cluster, which will allow the University not only to train students and other students to operate UAVs and develop intelligent systems for them, but also to certify aircraft. The development of this cluster will make it possible to carry out state tasks of the Ministry of Agriculture of Russia at a higher scientific and technical level (such as the development of a geoinformation model for monitoring the environmental assessment of reclaimed lands based on digital cartographic databases using Earth remote sensing technologies; the development of methods for using multispectral aerial and space survey materials for environmental monitoring of reclaimed lands; relief modeling based on materials from aerial and space surveys for the purpose of reclamation of reclaimed lands, etc.) and other high-tech developments.

- The agricultural cluster will become the basis for closer integration of the University both into the system of agricultural universities (this is where students of the “Protected Soil Engineer” profile will undergo practical training) and agricultural enterprises (cooperation in scientific support of their activities, including farms and subsidiary farms), systems of structures engaged in complex solving forest accounting problems.

- The cluster of the University’s Military Training Center will make it possible to take into account the experience of recent years (including in the conditions of a Special Military Operation) and advanced technologies when training military specialists in pontoon-bridge equipment.
The cluster of Glavgosexpertiza of Russia will allow linking the educational process and current scientific research in the architectural and construction field with the advanced practices and technologies available at the FAU “Glavgosexpertiza of Russia”, which remains faithful to the best traditions in this field and is at the same time open to innovation.

A unique feature of the Chkalovsky Agro(bio)technopark will be that all its components (clusters) will complement each other. Thus, the educational process will be carried out within the framework of not only the first – educational cluster, but also all the others. Filming and observations from UAVs of the state of crops in the agricultural cluster will make it possible to improve the technologies for their cultivation and protection, etc. That is, full use of the capabilities of all clusters will provide a synergistic effect.

Preliminary calculations allow us to evaluate the Chkalovsky Agro(bio)technopark project as completely economically justified: its total budget is from 3 to 20 billion rubles (attracted investments from investors, own funds, assistance from the founder - the Federal Ministry of Agriculture), the estimated period for full recoupment of these costs will be 7 years.

Since the creation of the Agro(bio)technopark is carried out by the university. It is very important that all this is linked with the opening of new, popular educational programs. These will be the following training profiles. For the agricultural block:

- Protected soil engineer.
- Ornamental plant growing and landscaping of populated areas.
- Green architecture of the urban environment.
- Unmanned aerial systems in agriculture.

For the technical block:

- Cadastral activities.
- Geospatial planning.
- Study of land resources using aerospace methods.
- Digital technologies and spatial modeling.
- Information systems and technologies.

According to the economic and legal block:

- Judicial land management examination.
- Regulation of land management and cadastral activities.
- Management of forest lands.

In addition, the opportunities for conducting practical classes in already open areas and profiles - geodesy, agronomy (training areas "Ecology and Natural Resources Management" and "Landscape Architecture") will be significantly expanded. As a result of practical classes, students will be able to learn the basic principles of working with landscapes, business processes for implementing a garden, will understand modern technologies and will be able to design unique and modern low-maintenance gardens.

4 Conclusion

Thus, the creation of the Chkalovsky Agro(bio)technopark as a unique infrastructure complex intended for the placement and operation on its territory of innovative companies and organizations whose activities are aimed at the development and production of high-tech products, the commercialization of existing scientific developments, the creation of systemic conditions for the harmonization of the activities of the University in the fields of education, science, production, education and training:

- Expedient.
- Fully consistent with the statutory activities of the University.
• Economically justified.
• Legal.
• Implementable in the next 5-6 years.

References

1. E.P. Ananicheva, Territorial organization of agrotechnoparks in the “science - education - production” system: dissertation, for the job application uch, Ph.D. degree, GUZ, Moscow, 216 (2013)
2. E.P. Ananicheva, Goals, objectives and prerequisites for creating agrotechnoparks in Russia, Russian economic online magazine, 2, 1 (2013)
5. Vasiliy Erokhin, Tianming Gao, Handbook of Research on Globalized Agricultural Trade and New Challenges for Food Security, Harbin Engineering University, China – published in the IGI Global book series, Advances in Environmental Engineering and Green Technologies (AEEGT) (ISSN: 2326-9162; eISSN: 2326-9170)
8. Z. Lerman, N. Shagaida, Land policies and agricultural land markets in Russia, Land Use Policy, 24, 1, 14-23 (2007)
9. V.N. Khlystun, Organizational and economic mechanisms for the involvement, use and protection of agricultural lands: monograph, GUZ, Moscow, 568 (2020)
11. A.V. Prishchepov, D. Muller, M. Dubinin, M. Baumann, V.C. Radeloff, Determinants of agricultural land abandonment in post-Soviet European Russia, Land Use Policy, 30, 1, 873-884 (2013)
12. Modern features of state regulation as a condition for the development of higher agricultural education in Russia: monograph, Col. authors, GUZ, Moscow, 128 (2020)