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## DEVELOPMENT OF HIGHER ENGINEERING EDUCATION IN RUSSIA IN THE CONTEXT OF BOLOGNA PROCESS

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### Abstract

The process of reforming higher education in Russian Federation continues. One of the main areas of these reforms is an introduction of principles of Bologna process into Russian higher education system. It was launched after Russia ratified the Bologna Declaration in 2003. Since the beginning of reforms and up to now there have not been lingering disputes about feasibility of introducing the principles of Bologna Agreement into higher education. The article deals with the history of reforms on the example of higher education in land management in Russia. Dynamics of indicators of higher education institutions which carry out training under programs in the field of land management and cadastre have been studied. Introduction of federal state educational standards associated with introduction and/ or updating of current education within Bologna process in 2020 has been considered. Updating (introduction of FGOS 3++ standard) will be implemented in all directions of bachelor degree. First of all it is guided to consideration of requirements of professional standards. The process of development of the Institute of State Accreditation of higher education institutions of Russia, its current status and problems faced by higher education institutions during accreditation process have been studied.

### Aim

The aim of the article is to study development of higher engineering education in Russia under Bologna process implementation conditions on the example of study direction “Land management and cadastre”.

### Tasks

The existing system of training of land surveyors in Russia and characteristics of higher education institutions preparing them have been studied, the changes which have taken place in higher education of the country as a whole, and also in the field land surveyors training during the reforms have been considered, as well as development of the institute of state accreditation of higher education institutions of Russia, its current state and problems have been analysed.

### Materials and methods

Materials of annual statistical reports published by Federal State Statistics Service of the Russian Federation (Rosstat) have been analyzed. Summary data published by Educational and Methodological Council on Education in the field of land management and cadastre have been studied.

Table 1

Dynamics of number of higher education institutions in direction of studies “Land management and cadastre”

Indicators	Year		
	2017	2018	2019
Total number of universities, including:	98	104	107
- under Ministry of Agriculture of Russia	37	40	40
- under Ministry of Education and Science of Russia	61	64	67
Total number of universities – members of EMC, including:	94	98	100
total number of students enrolled, including:	6980	7295	7244
- bachelor studies	5528	5697	5799
- Master studies	1395	1527	1387
- PhD studies	57	71	58
total number of graduates	6097	5933	6216
- bachelor studies	5379	4963	5026
- Master studies	672	936	1159
- PhD studies	46	34	31
Annual total number of students (from enrollment to graduation)	25593	26873	25400

### Results

To implement the land reform, which started in Russia in 1990, there was need for large number of professional staff - cadastre and land management specialists. Land management education in Russia has long history - in 2019 the State University of Land Management (in Moscow) celebrated its 240th anniversary. University was established in 1779 to teach specialists for land reform in Russia [Известия..., 2019]. The University graduates have carried out land reforms, large-scale works on land surveying and rational use of land. Nowadays State University of Land Management is the basic higher education institution in Russia in preparation of bachelors and masters in direction “Land management and cadastre”. At the University there has been created Educational and Methodical Council (further – EMC). It is attended by representatives of universities from different regions of Russia, where students have been prepared in this field. At present the number of appropriate universities has increased significantly. In Soviet period on territory of Russian Federation there were 5 universities in land management, in 2019 – 107 (Table 1).

In general, due to beginning of land reform in Russia, enrolment of students into higher education institutions for surveying studies has increased significantly. In 1991 throughout the country, there were only 675 enrolled students, because only 4 universities in the Russia prepared specialists in land surveying, land management and cadastre. When the land reform began, there come out the lack of specialists who could carry it out. Urgently were opened appropriate study programs - first in agrarian universities, then in others. In 2019 total number of enrolled students in bachelor, Master and PhD studies exceeded 7 thousand.

Studying the location of higher education institutions according federal regions of Russia, there can be noted significant differences - the maximum number are located in Tsentralnyy (24) and Privolzhskiy (21) region, the minimum number – in Dalnevostochniy (9), Uralskiy (9) and Severo-Kavkazskiy (8) region (Table 2)

### Conclusion

At present in Russia the reform of higher education system, including engineering specialities, continues. This process is part of modernization of higher education, which started after signing of Bologna Declaration in 2003. Bologna Process is aimed to create the pan-European education space, it represents the most significant structural reform of higher education in its history. The results of implemented reforms have been assessed ambiguously and there are both positive and negative consequences. As positive can be mentioned:

- integration of Russian education system into educational space of the world and mutual recognition of education documents;
- increase in academic and student mobility;
- unification of competence assessment according pan-European systems (credit rating, etc.);
- increase in competitiveness of Russian higher education institutions;
- expansion of participation in international scientific competitions and grants, forums and exhibitions, in international organizations and associations;
- increase in participation in international competitions, forums and exhibitions;
- increase in scientific and publishing activity within international citation systems Web of Science and Scopus;
- dissemination of knowledge and technologies, registration and implementation of the results of intellectual activity at the international level.

As negative consequences can be mentioned:

- increased bureaucratization of educational process;
- complicate system of credit points (ECTS) and complexity of its implementation;
- duplication of quality control functions at various levels;
- absence of ideas about the basic principles, goals and objectives of Bologna process leads to formal attitude to the changes taking place and to the general non-acceptance of the reforms.

There can be made general conclusions as follows:

1. Existing system of education of land surveyors in Russia has long history, currently is developing very actively. The number of universities training bachelors and masters in the field of land surveying and cadastre is increasing in spite of general decrease of total number of universities.
2. Within framework of Bologna Process two-level system for training of land surveyors was introduced in higher education in Russia - bachelor program (4 years) and Master program (2 years). At the same time employers prefer to employ graduates with Master diploma and engineers – land surveyors, bachelors are considered in case if they have practical experience and recommendations.
3. Possibility to change direction of training at enrollment in Master program leads to heterogeneity of levels of knowledge among students. It affects negatively the efficiency of educational process and requires the teacher to make additional efforts in the context of limited classroom hours.
4. Accreditation of higher education institutions is the mechanism how to control compliance with legislative requirements and the quality of training of students at higher education institutions.

Table 2

Breakdown of universities having study programs in field of land management and cadastre (2019)

Federal region (Oblastj)	Number of universities			Number of universities teaching in land management and cadastre	Number of study programs			Number of universities having part-time studies	Number of teachers	
	total	including Ministry of Education and Science	including Ministry of Agriculture		on bachelor level	on Master level	on PhD level		total	incl. professors and assoc. professors
Dalnevostochniy	9	5	4	9	9	7	0	7	82	50
Privolzhskiy	21	10	11	21	21	12	1	17	273	207
Severo-Zapadnyy	13	12	1	12	13	7	3	9	161	125
Severo-Kavkazskiy	8	4	4	8	8	6	1	8	88	68
Sibirskiy	11	7	4	9	11	9	4	8	194	138
Uralskiy	9	6	3	9	9	3	3	7	91	64
Tsentralnyy	24	15	9	21	22	12	6	20	400	299
Yuzhnyy	12	8	4	11	12	7	2	10	128	107
Total	107	67	40	100	105	63	20	86	1417	1058