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State support for the formation of the quality of human capital in the agricultural sector of the economy in leading foreign countries

A Yaroshchuk[1]*

[1] State University of Management, 99 Ryazanskiy prospekt, Moscow 109542 Russia

E-mail: fincredit2014@mail.ru

Abstract. The article discusses issues of state support for the formation of the quality of human capital in the agrarian sector of the economy in leading foreign countries, relying on the example of Germany, the USA, France, and Finland. Particular attention is focused on the possibility of applying the accumulated experience in the educational sphere of the above countries in the educational system of agricultural universities of Russia.

As domestic and foreign practice shows, active state participation in the formation of professional competencies of students and the retraining of agricultural enterprises can play an important role in recreating and maintaining the system of effective development of the agricultural sector at the proper level.

In recent years, in the agro-industrial complex in particular and domestic agriculture in general, there have been certain positive stabilization trends. At the same time, it is becoming increasingly obvious that it is impossible to reach the trajectory of further sustainable development without creating conditions for the expanded reproduction of human capital.

In this regard, of particular importance is the study and use of positive experience of state support for the formation of the quality of human capital in the agrarian sector of the economy in leading foreign countries.

An analysis of educational activities in developed countries shows that agrarian universities are very successful in training highly qualified specialists for agriculture.

It is known that the effective development of the agricultural sector largely depends on the degree of professionally trained personnel, who will subsequently determine the future of the agro-industrial complex. It is the level of their preparation that will determine the success of the functioning of both an individual agro-industrial enterprise and the agricultural sector as a whole.

The main task of agrarian universities now is to train specialists of a qualitatively new level who will be able to solve complex and responsible tasks facing the agricultural sector not only in a given period of time, but also in the long term.

The advanced experience currently available in foreign countries for training future specialists in the agricultural sector can have a great influence on the formation of the Russian system of training agricultural specialists taking into account existing national peculiarities.

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In this regard, the main task facing the domestic agro-education is, first of all, the creation of a qualitatively different system of higher education, which should be based on the effective interaction of higher educational institutions and specific employers in the agricultural sphere.

To this end, universities, as well as additional vocational education institutions need not only to establish close cooperation with agribusiness enterprises, but also to provide sustainable funding for educational and research activities, to have a modern material and technical base for the training of tomorrow's specialists.

It should be noted that the system of existing agricultural education in foreign countries, taking into account the existing state and regional programs and plans for the comprehensive development of rural areas, substantially differs from domestic concepts of training in higher agricultural educational institutions.

A distinctive feature of agricultural education in developed foreign countries is that here the training of multidisciplinary specialists goes beyond the usual boundaries of agricultural production. At the same time, as a rule, the curriculum is calculated both on students of different age categories and takes into account different levels of basic knowledge.

As is known, the agro-industrial complex plays an important role in the economic development of the state, since it directly affects food and economic security.

In this regard, for example, in the countries of the European Unionб there is a coherent, common agricultural policy (EU CAP), which leads to the presence of both the system of guaranteed prices and the policy of agrarian protectionism on the part of individual states, in particular, and European bodies, function effectively here authorities in general.

It is generally recognized that the Federal Republic of Germany, the leading element of the EU, is the most successful in implementing the system of higher vocational education in the field of agriculture. Germany provides itself with its own agricultural food by more than 95% [6].

The concept of rural development in Germany is developed, as a rule, for a period of five years. The main objective of the Concept appears to create a competitive and diversified agricultural sector.

It should be noted that, within the current state program, the federal states have the right to individually determine the degree of financial and other types of state support, taking into account the current socio-economic situation in the region.

In Germany, the federal government assistance to rural areas is carried out along the following lines:

- Comprehensive development and introduction of innovative technologies in order to improve the efficiency and competitiveness of agriculture and forestry;
- Improving the quality of the environment and landscape;
- Comprehensive development of the rural economy in order to increase the standard of living of the rural population.

All listed activities, including education expenses, are usually funded from the state budget [3].

Educational activities in Germany are carried out by the Ministry of Land Education. The current education system is based on a reasonable combination of theoretical and practical training, which allows one to train specialists at a high enough level. It should also be noted here that agricultural education in Germany is divided into professional and academic.

The basis of training in the German agricultural educational institutions is given precisely to vocational education, which is based on the so-called dual system. The essence of the dual training system consists in parallel combination of theoretical training in a vocational educational institution and practical training in an agricultural holding where practical training of students for professional activities is carried out. The training of students' professional skills is conducted in agrofirms, to which the relevant state bodies assign the category of educational.

A feature of agricultural education in Germany is that a student has the right to independently choose those disciplines that, in his/her opinion, are of the most necessary. At the same time, practical exercises constitute more than 75% of the study time. The teaching staff mainly conducts survey

lectures on the subjects chosen by the students. The term of study in agricultural educational institutions is 3 years.

At least once a week, students must attend lectures at an educational institution, and subsequently reinforce their knowledge with practical actions in practice areas. During the internship, students receive a salary that allows them to feel socially protected. The current practice also shows that all students after graduation remain for further employment in the agrofirms to which they underwent vocational training [3].

An extremely important element characterizing the German educational system is that here the demand in future agrofirms for future specialists is formed in advance. This state of affairs contributes to the fact that all school graduates start in advance to search for an agricultural organization that is interested in training professional specialists for their needs. An agreement is formed on the basis of interviews between the applicant and the organization. At the same time, a school graduate must have quite high marks in the school certificate, because his/her training is directly related to both the high-tech production process in the organization and the high demands on the organization and conduct of classes, high level of industry development.

Today in Germany, the agricultural industry is very prestigious, and hence the high demands on the formation of the quality of human capital. The existing system of training the agricultural personnel is extremely beneficial both for the agrofirms and students, bacause it allows the organization to prepare specialists for their own needs, and gives students the opportunity to gain sufficient knowledge and ensure their employment. In addition, a very significant proportion of the cost of training is borne by the state.

The federal authorities of Germany provide the following benefits for agricultural organizations in which students of educational institutions are trained:

- The profit received by agricultural organizations from selling the products manufactured in these training and production farms is considered domestic investments and used to support the educational process. These organizations pay the state only a tax of turnover;
- With a total VAT rate of 50%, the tax rate for training and production farms is only 7%;
- The state allocates subsidies for training and production enterprises at the rate of 1,840 euro / ha;
- The state provides long-term interest-free loans;
- The state-owned factories producing agricultural equipment and machinery provide educational institutions with their products free of charge for a period of 1 year.

High manufacturability of the agricultural industry in Germany provides for the retraining of personnel throughout the entire period of their work. Moreover, the passage of advanced training courses is enshrined at the legislative level for certain specialties. Along with this, it is necessary to emphasize that the presence of a certificate of advanced training and professional retraining are of great importance for the further professional and career growth of employees of agricultural firms [6].

A positive experience of human capital formation in agriculture exists in the United States of America. Government measures to support the formation of human capital in the United States are divided into direct and indirect. For example, direct government support measures in 2017 accounted for 15% of the USDA budget. Indirect measures of state support for agriculture are characterized by the following indicators: 73.4% of total funding was allocated for food programs, 6.8% for the protection of natural resources and the environment, 2% for rural development, and 1.9% for science and education, for market regulation programs [5].

Responsibilities for implementing programs of direct state support for agricultural producers in the United States are assigned to the Agency for the Promotion of Farms and Rural Development.

Government support in the USA for agricultural producers is provided through:

- Preferential loans to farms and agrofirms;

- Support for the economic activity of agricultural enterprises and measures to preserve and maintain a high-quality state land fund.

Agricultural education in the United States is characterized by two parameters: the greater half of educational institutions are funded by the state, the rest goes at the expense of private business. The essence of education is based on the triad known in the USA as "research – education – implementation".

Research activities in the US educational institutions, as a rule, are of a decentralized nature, which largely contributes to close mutually beneficial interaction between universities and agricultural producers.

The educational institutions of the United States have the following main tasks [5]:

- Improving the quality and level of education of the population living in rural areas;
- A substantive focus of ongoing research on solving existing and emerging problems in agricultural activities;
- All-round development of social, household, and industrial infrastructure of rural areas, the introduction of scientific developments in practical agricultural activities.

In the United States of America, as well as in Germany, there are educational and industrial complexes. After a certain time, these complexes, according to the agreement reached, can become the property of the agrofirm, which allows further educational institutions to have a permanent production site for practical training, as well as to engage in research and development activities directly on the ground.

Research-type universities are widely used in the United States, whose main activity is to advise agricultural producers, process information from them, and implement research projects.

In accordance with the current United States Constitution, agricultural provinces are governed by local provincial governments. Local authorities independently decide on the level of financing education expenses. The curriculum in high schools of the USA is structured in such a way that during the period of study, a student must study 20 compulsory subjects. The remaining academic disciplines belong to the disciplines of choice.

One of the main conditions for agricultural education in the United States is its practical orientation. In this regard, agricultural universities are located in the country in such a way that they necessarily take into account the specifics of the socio-economic development and geographical location of each region. Education of students is carried out taking into account the existing territorial characteristics and needs [6].

Significant positive experience in the system of modern agricultural education is also available in France. France is characterized by the predominance of public universities over private. In this regard, the French state has to allocate significant financial resources for the maintenance of agricultural educational institutions. The management of state agricultural institutions is carried out by the Ministry of Agriculture of France [2].

Currently, the system of agricultural education in France is based on three main components: education – research activities – long-term development.

An educational agricultural institution is the main element of the French educational system. It has a high degree of autonomy and independence. For France, it is characteristic of the integration of higher education institutions into regional networks, which in turn provides savings in financial resources allocated to the educational process. Creating joint electronic databases and electronic libraries became widespread in the university system of France.

Private universities in France are under the control of the Ministry of Agriculture. They are directly subordinate to the Directorate General for Education and Science, as well as the National Council for Private Agricultural Education and at the regional level the Directorate for Agriculture and Forest, which is also subordinate to the Ministry of Agriculture, and regional services for education and development.

One of the specific signs of French agricultural education is distance learning. The distance learning system in the French Ministry of Agriculture is headed by the National Center (CNPR). Its tasks include, above all, the organization of work with students from remote and remote areas of the country [2].

The agrarian education system currently in force in France allows high-quality training of specialists in the following areas:

- Engineers in the field of agronomy;
- Agricultural engineers;
- Specialized engineers: national school of landscape, national schools of water management and environment, schools of forestry;
- Agricultural engineers.

In a particular area here stands the training of specialists in the agricultural and agri-food sectors. In relation to this area there are:

- University technological institutes (IUT), which train specialists for two years. Upon completion of the training period, they are issued a university degree in technology (DUT) with a specialization in the field of agronomy and bio-food industry;
- Forming the first cycle. According to the results of training, a diploma of general university education (DEUG) is also issued in specialties related to the study of soil, the environment, as well as the management and organization of the agro-industrial complex;
- Education of the second cycle provides for the protection of a university degree and receiving a *matriza*, which is the right to engage in teaching. The emphasis in training is on specialization in such areas as agricultural economics, biology and biochemistry, genetics and physiology, plant protection, geology, geophysics, civil law in rural areas;
- Education of the third cycle (master) is carried out, as a rule, in the following main areas: preparation of diploma works on higher specialized education (DESS), or in-depth study of subjects (DEA), which acts as a necessary link in the preparation and defense of doctoral theses [2].

It should also be noted such an important feature of agricultural education in France as its practical orientation. In educational institutions of this country on production practices allotted a total of 15 months (from first to fifth courses) [2].

All this leads to the fact that a close, indissoluble connection of theoretical knowledge with practical skills of future specialists is being established. Starting from the first course, working practice with a total duration of 5 weeks takes place on a farm or in another other agrofirm in such working specialties as agricultural workers, tractor drivers, combine operators, etc. The purpose of practical training in the second year, for a period of 7 weeks (3 in spring and 4 in summer), is to gain practical skills in the use of diagnostic tools in agronomy and zootechnology. At the end of the third course, a student has an internship for 2 months and performs the functions of an assistant engineer in an agrofirm. Here that student gains practical skills in technical and managerial activities.

The research character of work experience is inherent in fourth year students. Its duration is 3 months. The purpose of the practice is to study the characteristics of the functioning of agricultural enterprises, organizations and services that are engaged both in research activities and in the introduction of various kinds of innovation processes into daily activities.

Thus, as a definite conclusion, it is necessary to emphasize that the analysis of the practical activity of the leading foreign countries on the formation of human capital for the agro-industrial complex of the country shows that, in contrast to Russian practice, to achieve significant, high-performance indicators in agriculture, the agricultural educational process implies relying on the practice-oriented approach.

Separate interest is the peculiarities of obtaining agricultural education in Finland. The system in Finland is fundamentally different from the Russian one. Finland has a network of farm colleges. The

process of training future specialists takes place not in the classrooms, but in the fields and in livestock farms. An example is the farm college "Koivikon-Kartanooy". On average, the college is designed for 70-80 people. On the territory of this farm-college, there are rooms for students, a guard house (for teaching rural tourism), a dairy factory (producing own butter and cheese), and a restaurant. There are about 160 cattle and 400 hectares of arable land.

The college works in partnership with the state, which allocates funds for supporting and organizing the educational process. The learning process lasts one year. During this time, farmers are prepared in only two directions – an agricultural entrepreneur and a cattleman. The peculiarity of learning is the study of only specialized disciplines [6].

The most prestigious agrarian profession in Finland is the veterinarian. The work of veterinarians causes great respect and is very well paid. Due to the fact that far from all farms can afford to have a veterinarian on staff, the national consulting service "ProAgria" works in the country, which employs such narrow specialists as livestock specialists, biologists, economists, agronomists, lawyers, etc. The employees of this center accompany the farms and give them the necessary recommendations. For example, they send information about how to care for animals and how to feed them. In Finland, the consulting service "ProAgria" has existed on this principle for many years [6].

Thus, the conducted research in the field of human capital formation in foreign countries shows that in countries with a high level of agricultural development, government support measures based on the application of a practice-oriented approach in the educational process are important [7].

The changes taking place in the educational institutions of the considered countries are aimed, first of all, at improving the quality of education in order to provide the agricultural sector with highly qualified specialists [8].

References

[1] Experience of dual education in Germany, Kazakhstan, Russia *Accreditation in Education* (http://www.akvobr.ru/opyt_dualnogo_obuchenia.html)

[2] Guschina O D 2005 *The main trends in the preparation of graduates of agricultural profile in modern France (dissertation)* (Kursk, Russia: Kursk State University) p 220

[3] The dual education system in Germany - what it is and what it is eaten with (https://megamozg.ru/post/7556)

[4] Zhigalova L P 2010 Features of the functioning of the land grant of universities on the example of the University of Texas and California Part 1 *Orthodox Educational Portal* (https://www.portalslovo.ru/impressionism/36312.php)

[5] Quarterly newsletter 2015 *Tomskiy Agrovestnik* **3**(47) pp 39

[6] Maltseva V A 2014 *The evolution of state support for agriculture: foreign experience, recommendations for Russia (dissertation)* (Ekaterinburg, Russia) pp 157

[7] Rosstat 2014 *Regions of Russia The main characteristics of the subjects of the Russian Federation Statistical compilation 2014* (Moscow, Russia: Rosstat) p 652

[8] Bogoviz A V, Alekseev A N and Chepik D A 2018 Improvement of the economic mechanism of state support for innovational development of the Russian agro-industrial complex in the conditions of import substitution *Advances in Intelligent Systems and Computing* **622** pp 555-561

[9] Bogoviz A V, Taranov P M and Shuvaev A V 2018 Innovational tools for provision of food security through state support for the agro-industrial complex in the conditions of digital economy *Advances in Intelligent Systems and Computing* **622** pp 659-665