

Human Resources Structure of the Land Reclamation Department: Sustainable Development Status and Trends

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Abstract: The purpose of the work is to study the human resources reclamation, the status, and main trends of its formation and development as the main resource for the reclamation industry development. In this study, a scientific-practical and system-logical analysis of the personnel structure of 62 FSBI "Meliovodkhoz Management", subordinate to the Land Reclamation Department, in all federal districts was carried out. In particular, assessment results of the impact of the land reclamation personnel structure and their supplementary vocational education system are presented in detail. Dependences were revealed between the specific weights of all employees of the FSBI "Meliovodkhoz Management" and the percentage of these employees trained in the supplementary vocational education system, in the context of the RF Federal District. On the basis of the results of the scientific and practical study of the human resources peculiarities of the land reclamation industry, recommendations have been identified to improve the formation process of human resources in the agro-industrial complex of the Land Reclamation Department.

1 INTRODUCTION

In the context of the implementation of the State Program for the Development of Agriculture and Regulation of Agricultural Products, Raw Materials and Foodstuffs for the Period up to 2025 and the Departmental Program "Development of the Land Reclamation Complex of Russia", the issues of studying, identifying and solving the problems of forming human resources in the agricultural sector and, in particular, the formation of human resources in the land reclamation industry.

2 RESEARCH METHODOLOGY

The theoretical and methodological features of the production and personnel potential formation of the agro-industrial complex of Russia are studied in the scientific works of T.I. Gulyaeva, E.V. Buraeva, O.Yu. Grishaeva (Gulyaeva et al., 2015), M.L.

Vartanova (Vartanova, 2017), A.V. Kozlov (Kozlov, 2015), I.N. Primyshev, S.G. Cheremisina, S.S. Skaranik (Primyshev et al., 2018), Noskova M.V. (Noskova, 2010), Khlusov V.N., Khlusova I.A. (Khlusov V.N. and Khlusova I.A., 2017), etc. Nevertheless, the concept of "human resources" in land reclamation remains insufficiently studied and developed in industry research.

In this study, to determine its scientific and methodological basis and content-structural elements, the results of the analysis of the category of "human resources" by branches of the agro-industrial complex (AIC) are presented and the main trends of its formation and development are highlighted:

- personal-professional and socio-cultural orientation;
- structural-professional and competence orientation.

These trends in the human resources formation make it possible to determine the totality of its main structural and content elements:

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- personal and individual, mental and physiological,
- socio-cultural and demographic,
- professional competence and technological,
- industrial, production and innovation,
- self-organization, self-learning and self-development.

The results of the theoretical analysis of “human resources” concept and its formation factors allow us to single out a certain set of scientific and methodological approaches at the mega, macro and micro levels of socio-economic and sectoral interaction. These approaches include strategic, system-management, organizational-functional, activity-integrated and production-sectoral.

Research methods: theoretical and practical analysis, development and systematization of information and analytical materials on the structure of personnel of the Federal State Budgetary Institutions of the Land Reclamation Department of the Ministry of Agriculture of the Russian Federation and the supplementary vocational education system, logical and situational analysis, methods of statistical analysis, methods of processing and generalization of results.

3 RESULTS OF RESEARCH

The authors analyzed the personnel structure of 62 FSBI “Meliovodkhoz Management”, subordinate to the Land Reclamation Department of the Ministry of Agriculture of the Russian Federation, in all federal districts for 2015-2019. In particular, the relationship between the FSBI human resources structure and the supplementary vocational education system was analyzed in detail. The total sample of the FSBI employees was 44357 people, by year: 2015 – 10,844 people; 2016 – 10,606 people; 2017 – 10,083 people; 2018 – 6,404 people; 2019 – 6,420 people.

Applying the correlation analysis, the authors identified and analyzed the relationship between the specific weights of the human resources structure of FSBI “Meliovodkhoz Management” and the percentage of employees trained in the supplementary vocational education system.

The absolute value of the correlation coefficient k evaluates the relationship between the corresponding values of two features on the Chaddock scale (Table 1).

Table 1: Chaddock scale.

$ k $	from 0.1 to 0.3	from 0.3 to 0.5	from 0.5 to 0.7	from 0.7 to 0.9	from 0.9 to 0.99
characteristic	Weak	Moderate	Marked	High	Very high

Source: Theory of Statistics, 2004.

A positive correlation coefficient indicates a direct relationship (with an increase in the values of one feature, the corresponding values of another feature increase). A negative correlation coefficient indicates a reverse relationship (with an increase in the values of one feature, the corresponding values of the other feature decrease).

The authors calculated the correlation coefficients between the average annual shares of employees in the human resources structure of FSBI “Meliovodkhoz Management” and the average annual percentage of the same employees trained in the supplementary vocational education system in the context of federal districts for 2015-2019 (Table 2).

Table 2: Correlation coefficients between the average annual shares of employees of FSBI “Meliovodkhoz Management” and the average annual percentage of the same employees trained in the supplementary vocational education system for 2015-2019.

Federal District	Managers	Experts	Other employees	Workers
CFD	0	0	0.6	-0.4
NWFD	-0.3	0.3	0.5	0.2
NCFD	-0.3	-0.7	-0.6	0.6
SFD	0.6	-0.7	-0.4	0.8
VFD	0.5	0.5	0.1	0.3
UFD	1	-1	-	-1
SibFD	0	0	0	-0.1
FEFD	0.5	-0.5	-0.6	1

Source: authors' calculations

Table 3, in accordance with the Chaddock scale, shows the characteristic of the relationship between the average annual proportions of employees of FSBI “Meliovodkhoz Management” and the average annual percentage of the same employees trained in the supplementary vocational education system.

Arrows ↑ and ↓ indicate direct and reverse relationship, respectively.

Table 3: Characteristics of the relationship between the average annual share of employees in the personnel structure of FSBI “Meliovodkhoz Management” and the average annual percentage of the same employees trained in the supplementary vocational education system.

Federal District	Managers	Experts	Other employees	Workers
CFD	not available	not available	marked ↑	moderate ↓
NWFD	moderate ↓	moderate ↓	marked ↑	weak ↑
NCFD	moderate ↓	high ↓	marked ↓	marked ↑
SFD	marked ↑	high ↓	moderate ↓	high ↑
VFD	marked ↑	marked ↑	weak ↑	moderate ↑
UFD	very high ↑	very high	not detected	very high ↓
SibFD	not available	not available	not available	weak ↓
FEFD	marked ↑	marked ↓	marked ↓	very high ↑

Source: authors' calculations

The authors also calculated the correlation coefficients between the average annual specific weights of the personnel age structure of FSBI “Meliovodkhoz Management” and the average annual specific weights of the age structure of

employees trained in the supplementary vocational education system in all federal districts for 2015-2019 (Table 4).

Table 4: Correlation coefficients between the average annual specific weights of the employees age structure of FSBI “Meliovodkhoz Management” and the average annual specific weights of the age structure of employees trained in the supplementary vocational education system.

Federal District	under 25	25-29	30-39	40-49	50-59	60-64	65 years and above
CFD	0.6	0	0.3	0.4	0.4	0.5	0.5
NWFD	-0.2	0.2	0.3	0.5	0.6	0.2	-0.3
NCFD	1	1	1	-1	1	1	1
SFD	-0.4	0.2	0.9	-1	0	0.2	0.6
VFD	0.7	0.8	0.2	0.6	0	0.5	0.6
UFD	-	-	-1	-1	1	1	1
SibFD	-	0.4	0.3	0.4	0.4	0	0.1
FEFD	-	0.5	0.4	0.6	0.6	0.6	1

Source: authors' calculations

Table 5 shows the characteristics of the relationship between the personnel age structure of FSBI “Meliovodkhoz Management” and the age structure of employees trained in the supplementary vocational education system.

Table 5: Characteristics of the relationship between the personnel age structure of FSBI “Meliovodkhoz Management” and the age structure of employees trained in the supplementary vocational education system.

Federal District	under 25 years	25-29	30-39	40-49	50-59	60-64	65 years and above
CFD	marked ↑	not available	moderate ↑	moderate ↓	moderate ↓	marked ↑	marked ↑
NWFD	weak ↓	weak ↑	moderate	marked ↑	marked ↓	weak ↓	moderate

Federal District	under 25 years	25-29	30-39	40-49	50-59	60-64	65 years and above
NCFD	very high ↑	very high ↑	very high ↑	very high ↓	very high ↑	very high ↑	very high ↑
SFD	moderate ↓	weak ↑	very high ↑	very high ↑	not available	weak ↓	marked ↑
VFD	high ↑	high ↑	weak ↑	marked ↓	not available	marked ↑	marked ↑
UFD	– not detected	– not detected	very high ↓	very high ↓	very high ↑	very high ↑	very high ↑
SibFD	– not detected	moderate ↓	moderate ↑	moderate ↑	moderate ↑	not available	weak ↑
FEFD	not detected	marked ↑	moderate ↓	marked ↑	marked ↑	marked ↑	very high ↑

Source: authors' calculations

To further study the relationship between the FSBI human resources structure and the system of advanced training and retraining of personnel in the supplementary vocational education system, the authors compared the average annual shares of FSBI human resources structure and the average annual percentages of employees trained in the supplementary vocational education system, as well as the average annual shares of the FSBI personnel age structure and the average annual shares age groups of employees trained in the supplementary vocational education system, by federal district for 2015-2019 (Olgarenko and Ugryumova, 2020). The analysis results made it possible to formulate the following conclusions:

1) in the Central Federal District and Northwestern Federal District, the percentage of managers trained in the supplementary vocational education system exceeds their share in the human resources structure.

2) in the North Caucasian Federal District, the percentage of managers and other employees trained in the supplementary vocational education system exceeds their share in the human resources structure.

3) in the Volga Federal District, the Siberian Federal District, and the Far Eastern Federal District, the percentage of managers and specialists trained in the supplementary vocational education system exceeds their share in the human resources structure.

4) in the Southern Federal District, the percentage of managers, specialists, and other employees trained in the supplementary vocational education system exceeds their share in the human resources structure.

5) in the Ural Federal District, the percentage of managers, specialists, other employees, and workers trained in the supplementary vocational education system is lower than their share in the human resources structure.

Note that in all federal districts, except for the Ural Federal District, the percentage of managers trained in the supplementary vocational education system is higher than their shares in the human resources structure, and in all federal districts, the percentage of workers trained in the supplementary vocational education system is lower than their shares in the human resources structure. This situation testifies to the focus of the management on expanding competencies and, unfortunately, to the lack of interest of workers to improve their qualifications.

Based on the results of the analysis of the age structure of employees trained in the supplementary vocational education system in the Federal District of the Russian Federation for 2015-2019 the following conclusions were made:

1) in the Central Federal District, the percentage of employees between the ages of 30 and 64 trained in the supplementary vocational education system exceeds their share in the human resources structure.

2) in the North Caucasian Federal District, the percentage of employees aged 25 to 39 years trained in the supplementary vocational education system exceeds their share in the human resources structure.

3) in the Volga Federal District, the percentage of employees aged 30 to 39 years and from 60 to 64 years trained in the supplementary vocational education system exceed their share in the human resources structure.

4) in the Siberian Federal District, the percentage of employees aged 30 to 59 trained in the supplementary vocational education system exceeds their share in the human resources structure.

5) in the Northwestern Federal District and the Southern Federal District, the percentage of employees aged 30 to 49 trained in the supplementary

vocational education system exceeds their share in the human resources structure.

6) in the Ural Federal District, the percentage of employees aged 30 to 39 years and 65 years and older trained in the supplementary vocational education system exceeds their share in the human resources structure.

7) in the Far Eastern Federal District, the percentage of employees aged 65 to 64 trained in the supplementary vocational education system exceeds their share in the human resources structure.

Let us note that in all federal districts, except for the Far Eastern Federal District, the percentage of employees aged 30 to 39 trained in the supplementary vocational education system exceeds their share in the human resources structure.

4 RESULTS AND DISCUSSION

Table 3 shows the following:

1) the relationship between the proportions of managers and the percentage of managers trained in the supplementary vocational education system in the Central Federal District and the Siberian Federal District is not registered, in the Urals Federal District it is direct and very high, in the Southern Federal District, the Volga Federal District and the Far Eastern Federal District - direct and marked, in the Northwestern Federal District and the North Caucasian Federal District it is reverse and moderate;

2) the relationship between the proportions of specialists and the percentage of specialists trained in the supplementary vocational education system in the Central Federal District and the Siberian Federal District is not registered, in the Volga Federal District it is direct and marked, in the Northwestern Federal District - direct and moderate, in the Urals Federal District it is reverse and very high, in the North Caucasian Federal District and the Southern Federal District it is reverse and high, in the Far Eastern Federal District it is the reverse and marked;

3) the relationship between the proportions of other employees and the percentage of other employees trained in the supplementary vocational education system is not registered in the Ural Federal District and the Siberian Federal District, in the Central Federal District and the Northwestern Federal District it is direct and marked, in the Volga Federal District it is direct and weak, in the North Caucasian Federal District and the Far Eastern Federal District it is reverse and marked, in the Southern Federal District it is reverse and moderate;

4) the relationship between the specific weights of workers and the percentage of workers trained in the supplementary vocational education, in the Far Eastern Federal District is direct and very high, in the Southern Federal District it is direct and high, in the North Caucasian Federal District it is direct and marked, in the Volga Federal District it is direct and moderate, in the Northwestern Federal District it is direct and weak, in the Ural Federal District it is reverse and very high, in the Central Federal District it is reverse and moderate, in the Siberian Federal District it is reverse and weak,

Similarly, table 3 shows the following:

1) the relationship between the specific weights of the age group “under 25 years” and people from this group trained in the supplementary vocational education system, in the Ural Federal District, the Siberian Federal District and the Far Eastern Federal District is not registered, in the North Caucasian Federal District it is direct and very high, in the Volga Federal District it is direct and high, in the Central Federal District it is direct and marked, in the Southern Federal District it is reverse and marked, in the Northwestern Federal District it is reverse and weak;

2) the relationship between the specific weights of the age group “from 25 to 30 years” and people from this group trained in the supplementary vocational education system, in the Central Federal District and the Urals Federal District is not registered, in the North Caucasian Federal District it is direct and very high, in the Volga Federal District it is direct and high, in the Far Eastern Federal District it is direct and marked, in the Northwestern Federal District and the Southern Federal District it is direct and weak, in the Siberian Federal District it is reverse and moderate,

3) the relationship between the specific weights of the age group “from 30 to 40 years” and people from this group trained in the supplementary vocational education system, in the North Caucasian Federal District is direct and very high, in the Central Federal District, Northwestern Federal District and the Siberian Federal District it is direct and moderate, in the Volga Federal District it is direct and weak, in the Southern Federal District and the Ural Federal District it is reverse and very high, in the Far Eastern Federal District it is reverse and moderate;

4) the relationship between the specific weights of the age group “from 40 to 50 years” and people from this group trained in the supplementary vocational education system, in the Northwestern Federal District and the Far Eastern Federal District is direct and salient, in the Siberian Federal District it is direct and moderate, in the North Caucasian Federal

District, the Southern Federal District and the Ural Federal District it is reverse and very high, in the Volga Federal District it is reverse and marked, in the Central Federal District it is reverse and moderate;

5) the relationship between the specific weights of the age group “from 50 to 60 years” and people from this group trained in the supplementary vocational education system, in the Southern Federal District and the Volga Federal District is not registered, in the North Caucasian Federal District and the Ural Federal District it is direct and very high, in the Far Eastern Federal District it is direct and marked, in the Siberian Federal District it is direct and moderate, in the Northwestern Federal District it is reverse and marked, in the Central Federal District it is reverse and moderate;

6) the relationship between the specific weights of the age group “from 60 to 65 years” and people from this group trained in the supplementary vocational education system, in the Siberian Federal District is not registered, in the North Caucasian Federal District and the Ural Federal District it is direct and very high, in the Central Federal District, the Volga Federal District and the Far Eastern Federal District it is direct and marked, in the Northwestern Federal District and the Southern Federal District it is reverse and weak;

7) the relationship between the specific weights of the age group “65 years and older” and people from this group trained in the supplementary vocational education system, in the North Caucasian Federal District, the Ural Federal District, and the Far Eastern Federal District is direct and very high, in the Southern Federal District and the Volga Federal District it is direct and salient, in the Siberian Federal District it is direct and weak, in the Northwestern Federal District it is reverse and moderate.

Thus, territories and human resources groups that are most sensitive to the supplementary vocational education were identified.

5 CONCLUSIONS

The status of human resources potential in the institutions of the Land Reclamation Department revealed as a result of the study indicates serious threats to its development, which is largely a reflection of the all-Russian pattern that has developed on the national labor market.

Based on the study results, the authors consider it is necessary to give the following recommendations for improving the process of forming the personnel potential of the land reclamation of the agro-industrial complex of Russia.

From the legislative point of view, it is necessary:

- to introduce amendments to the legislatively established terms for the frequency of professional development and retraining of personnel, differentiated by categories and job responsibilities. For example:
 - 1) Managers – at least once 3 years;
 - 2) Experts – at least once 3-5 years;
 - 3) Employees – at least once 3-5 years;
 - 4) Workers – at least once 5 years.
- to create state branch institutions for the supplementary vocational education as vocational and educational centers for professional excellence in the agro-industrial complex.

From the regulatory and methodological point of view, it is necessary:

- to develop and systematically monitor the staffing of the institutions of the Land Reclamation Department as the main technology for building the potential of the workforce in the industry. This monitoring will make it possible to form a unified human resources database of the Land Reclamation Department and its systematic updating.
- to develop and approve sectoral programs for the development of professional agrarian education for the future (5-10 years) in order to effectively achieve the goals of Federal acts in the field of socio-economic development of ACP and vocational education.

From the point of view of the formation of the personnel potential of the institutions of the Land Reclamation Department, it is necessary:

- to pay special attention to the presence of feedback between the employees of the considered groups and employees studying in the supplementary vocational education system, in which the greater the number of employees of a certain category or age group, the fewer of them are trained in the supplementary vocational education system.
- to take into account the specific features of catch-up education and the psychophysiological characteristics of the perception and training of the adult population, the prevailing age groups training in the supplementary vocational education system (40-49 years, 50-59 years and over 64 years);
- to take into account the existing clustering of the FSBI of the Land Reclamation Department, which will make it possible to predict the

supplementary vocational education for the future, when forming plans for the sectoral supplementary vocational education.

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