

Problems of manpower formation and use in a region with agro-industrial specialization

Problemas de formación de mano de obra y uso en una región con especialización agroindustrial

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ABSTRACT:

This paper aims to identify the specifics of the formation and use of manpower in regions with the dominating agrarian sector, to analyze the current staffing level in the agricultural sector of the Altai Region and, on the basis of the data obtained, to develop proposals for improving the system for manpower formation for regions with agro-industrial specialization. In the paper, the features of staffing in the agrarian sector, conditions and factors influencing the formation of the personnel structure of the sector are considered; the paper presents the current state of affairs in the agrarian sector of the Altai Region, trends and problems regarding labor supply. In addition, some ways were offered to improve the formation and use of manpower for an agricultural region, and proposals were developed to improve the efficiency of human resources in the agrarian sector.

Keywords: labor resources; agrarian sector; agrarian region; manpower formation.

RESUMEN:

Este trabajo pretende identificar las especificidades de la formación y uso de la mano de obra en regiones con el sector agrario dominante, analizar el nivel actual de dotación de personal en el sector agropecuario de la región de Altai y, sobre la base de los datos obtenidos, desarrollar propuestas para mejorar el sistema de formación de mano de obra para las regiones con especialización agroindustrial. En el documento se consideran las características del personal en el sector agrario, las condiciones y los factores que influyen en la formación de la estructura del personal del sector; el documento presenta el estado actual de los asuntos en el sector agrario de la región de Altai, tendencias y problemas relacionados con el suministro de mano de obra. Además, se ofrecieron algunas formas de mejorar la formación y el uso de mano de obra para una región agrícola, y se desarrollaron propuestas para mejorar la eficiencia de los recursos humanos en el sector agrario.

Palabras clave: recursos laborales; sector agrario; región agraria; formación de mano de obra.

1. Introduction

The issues of agricultural development have already been among the most relevant for several years, both for Russia as a whole and for its particular regions. This is due to the important role that is played by the country's agriculture, namely:

- agriculture provides the population with basic types of food (bakery products, dairy products, meat products, vegetables, fruits, etc.). Lack of food resources will inevitably lead to a food crisis, a significant increase in prices, the need to import food;
- agriculture stimulates the development of other sectors of the economy (such as fuel energy, agricultural machinery, food industry, and transport);
- the countryside is the main source of manpower for cities and army conscription (on average, 70% of draftees are rural young people);
- the main and sometimes non-alternative type of economic activity is people's employment in agriculture, inasmuch as the countryside occupies 2/3 of the territory of Russia;
- agriculture contributes to the preservation of national specific features, traditions, culture and the historical way of life of many Russia's nations.

Currently, the agrarian sector of the economy is experiencing a number of personnel difficulties, primarily related to a low inflow of young manpower and low level of personnel retention in the sector. This problem is especially acute for regions with agro-industrial specialization, which are among so-called "depressed" and subsidized. To this end, the Altai Region is a typical agrarian region with an unstructured agrarian labor market, an imbalance in the demand and supply of labor, average standard of living of the population. Meantime, the share of agriculture in Altai's GRP has been stable for many years at 16-18% (Kukarskaya, 2012), being one of the highest in Russia. In this regard, agro-industrial production is a priority in the structure of socio-economic development of the Altai Region. Consequently, the solution of the tasks of labor supply in the agrarian sector and effective formation and use of the workforce of the sector are the primary and basic condition for the development of the most important branch of the regional economy.

Today, the focus in working with agricultural personnel shifts not to an increase in their number (which is impossible for a few reasons), but to an increase in their competence seeking to release their potential, to develop some labor culture and skills to work in crisis and extreme conditions. With the reduction of state intervention in the agro-industrial complex, the growing autonomy and therefore the degree of responsibility of agro-entities, it is up to them to take care of personnel sourcing, maintaining and raising the professional level of employees.

2. Methodology

The paper applies general scientific methods of logical and system analysis and synthesis, as well as special methods, such as economic-statistical, sociological survey, expert assessment, comparisons and analogies.

The methodological, theoretical and information basis of the paper was the works by domestic and foreign authors on economics and management in the agrarian sector, theory and practice of personnel management; legislative acts and regulations of the Russian Federation and the Altai Region; the data of the sociological survey conducted by the authors among students of the Federal State Educational Institution of Higher Education "Altai State Agrarian University" and CEOs of agricultural enterprises of the Altai Region; data of the Territorial Body of the Federal State Statistics Service in the Altai Region; official information resources on the Internet.

In studying the issues of agriculture economics and management and its prospects, we used the works by Kundius (2010), Kukarskaya (2012), Skulskaya (2009), and Gordeyev (2010).

Various aspects of workforce potential, human resources, human capital and personnel sourcing into the agrarian sector are reflected in the works by Lukashovich (2008), Kameneva (2011), Kazakbaeva (2005), and Danchenko-Morozova (2013).

3. Results

3.1. The current staffing level in the agrarian sector of the Altai Region.

In the Altai Region, which ranks 8th in Russia in terms of agricultural output, with an average annual number of employed in the economy equaling 1,126 thousand people, only 208.8 thousand people are engaged in agriculture, i.e., 18.5% (Territorial Body of the Federal State Statistics Service in the Altai Region, 2016b), although there is a demand for skilled workers for agricultural entities. Nevertheless, it is the agrarian sector that is leading in terms of the number of employed people. For comparison: manufacturing employs some 143.3 thousand people; wholesale and retail – 188.7; education – 99.7 (according to the data for 2015). The number of employed in the Altai Region’s agriculture for several years is shown in Table 1:

Table 1
The number of employed in the Altai Region’s agriculture (2011-2015)

Parameters	2011	2012	2013	2014	2015
Total employed people, thousand	1,075.6	1,078.1	1,075.0	1,063.8	1,066.6
People employed in agriculture, thousand	212.9	209.9	206.6	204.2	204.2
Portion of people employed in agriculture, %	19.8	19.5	19.2	19.2	19.1

Over the years, the share of the population employed in agriculture changes insignificantly, but in absolute terms, a decrease of 18.4 thousand people over 8 years, or 1.1%, has occurred. Similar trends are observed in other regions of the Siberian Federal District (SFD) and in Russia in general. For example, in the Omsk Region over the past 10 years the number of people employed in agriculture had decreased by 32 thousand people, in Novosibirsk – by more than 33 thousand people, and on average in Russia – by more than 2.5 million people (Kundius, 2010).

The quantitative indicators of manpower density in agricultural enterprises of the region are steadily falling. The analysis of staffing level in agriculture in the Altai Region showed that since 1998, the number of top managers and specialists has decreased by 54%, including key specialists by 57.3%, middle-level specialists by 50%, and middle-level managers by 53.8%. Most of all, the annual reduction in agricultural personnel refers to agronomists, veterinarians and engineers. The general need for managers and specialists, according to the data of the Main Directorate of Agriculture, remains stable over years and amounts to about 600-700 people (Sycheva *et al.*, 2015).

The average staffing level, according to the survey conducted in agricultural organizations of the region, is in the range from 80 to 95%, while the average level of managers was 81%, specialists – 78%, and workers – 91%. Studying the staffing level in the context of various specialties, it can be noted that the lowest indicators characterize the positions of chief agronomist, chief animal technician, chief economist, agronomist, chief veterinarian and farm machinery operator (Belaya, 2011). Also, CEOs noted that great difficulties arise with the management of working personnel. On the one hand, it is easy enough to find workers for unskilled and low-skilled labor, but on the other hand, it is practically impossible to change the

mentality, habits and way of life of a villager, which negatively affects the discipline and labor performance.

Current trends lead to the fact that in the future the dynamics of the sectoral structure of employment will be characterized by redistribution of labor into the non-manufacturing sphere of the economy, where, according to statistics, the proportion of employers is gradually increasing: from 34.9% in 2007 to 37.2% in 2012 along with a decrease in the percentage of employment in agriculture for the same period by 1.3%. One can expect an increase in the number of employees in trade, public catering, services, as well as in industries related to financial and credit or insurance activities. The forecasted increase in the number of employees in those sectors will be owing to a reduction in the number of employees in manufacturing and agriculture.

The decrease in the number of people employed in agriculture occurs against the background of a general negative demographic trend in the Altai Region (Table 2). The demographic indicators evidence some quantitative loss of manpower, because as a result of population loss, its formation source is being lost.

Table 2
Main demographic indicators of the Altai Region (2011-2016), thousand people

Parameters	2011	2012	2013	2014	2015	2016
Total population	2,417.4	2,407.2	2,398.7	2,390.6	2,384.8	2,376.8
Urban population	1,324.0	1,327.6	1,331.0	1,333.1	1,335.6	1,335.3
Rural population	1,093.4	1,079.6	1,067.7	1,057.5	1,049.2	1,041.5

In general, over the past 10 years, the population of the Altai Region has decreased by 144.6 thousand people, of which the rural population – the main source of formation of the sectoral human capital – was 114.7 thousand people, while urban - only 29.9 thousand people. The main reason is active intraregional migration processes characterized by urbanization (Table 3). In addition, the regions of the Central Federal District of Russia are becoming more attractive for life and job search, while those of the Siberian Federal District are marked by active migration loss (Rosstat, 2013).

Table 3
Indicators of migration of rural and urban population in the Altai Region (2011-2015), persons

Year	Urban population		Rural population	
	In	Out	In	Out
2011	24,350	17,637	27,995	34,708
2012	28,162	22,121	30,944	36,985
2013	28,382	23,789	30,953	35,546
2014	24,829	20,669	27,172	31,332

2015	22,580	20,533	26,525	28,572
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Such processes are typical for modern Russia as a whole and its regions: urbanization and growth of the number of cities lead to annual disappearance of hundreds of villages. So, for example, the number of rural population in the Novosibirsk Region during 10 years decreased by 70 thousand people, and in the Omsk Region - by 120 thousand people. In general, since 2006, Russia entered a period of absolute reduction in the number of manpower (Skulskaya, 2009).

The age structure of the population is also not in favor of the agrarian sector. 54% of the urban population are in the age group being in the period of working capacity. In rural areas, the share of such population is 47%, while the remaining 53% fall either on those whose working capacity is at the stage of formation and, most likely, will only to a small extent replenish the agrarian sector, or on those people who are at the stage of a gradual decline in the cost of labor.

One of the characteristics of the state of the manpower and its quality is the level of education (Schmid, 1993). Tracing the dynamics of demand for various levels of educational services in agriculture, we can draw conclusions, first, on the decline in the popularity of primary and secondary professional education against the background of growing demand for higher professional education; second, on the decrease in demand for agricultural professions against the growing popularity of learning economics and management, humanities, information technologies, energy, electrical engineering, healthcare (Table 4) (Territorial Body of the Federal State Statistics Service in the Altai Region, 2016b) .

Table 4
Graduated professional agricultural manpower in the Altai Region by levels of education (2011-2015), persons

Level of education	2011	2012	2013	2014	2015
Primary professional	982	316	829	N/A	N/A
Secondary professional	329	316	332	N/A	N/A
Higher professional	687	637	660	548	624

However, it should be noted that in practice only a part of graduates are employed in agricultural organizations. According to the official data, about 30% of the total number of full-time university graduates on average in Russia, educated at the expense of the federal budget, are engaged directly in agricultural production. Meantime, those working in the countryside, i.e., staying there, are not more than 18%. In the Altai Region, according to various estimates, only every 10th-13th person who left the countryside for study returns back, and in 2007-2014, the agricultural sector has been replenished with young manpower at no more than 9% (Belaya, 2014). Thus, the rural area annually loses some of its workforce, and the agricultural sector is not renewed with qualified personnel.

In addition to basic education, other forms of training contribute to the improvement of the quality of manpower, such as advanced training and additional professional education of personnel. Agricultural organizations are characterized by low regularity of advanced training and coverage of an insignificant share of personnel. Although, the recent years have seen an improvement of the situation to the better; nevertheless, the human capital of the agricultural sector lacks investment in educational, professional and intellectual components. As evidence, we draw the following data (Table 5).

Table 5
Advanced training of agricultural organizations' personnel in the Altai Region (2004-2014)

Parameter	2004	2008	2010	2012	2014
Average regularity of advanced training, years	40.3	22.4	18.7	12.0	18.2
Share of employees who had advanced training, %	2.5	4.5	5.3	7.2	5.8

Another important characteristic that determines the opportunities for effective use of manpower and unlocking the potential of human resources is biological parameters of employees, in particular, their age. Age affects health, while the productivity of a person is largely determined by his/her psychophysiological state. In addition, the age structure can indicate the turnover of personnel, the continuity of generations, and the prospects of the sector as a whole. In agricultural organizations of the Altai Region, the age groups are distributed as follows (Belaya, 2011):

- employees under 20 – 5.1%;
- 20-29 – 18.3%;
- 30-39 – 20.3%;
- 40-49 – 27%;
- 50-59 – 23%;
- 60-72 – 6.3%.

From the distribution of the personnel of agricultural organizations of the Altai Region by age, we can conclude that there is a tendency for personnel "aging", which is most evident among the top management. The group of employees of pre-retirement and retirement age is significant – more than a fifth. In general, the growth in the number of top managers who have reached the pre-retirement and retirement age, along with the reduction in the number of managers under 35 is a trend that is typical for agriculture in many regions (for example, the same situation has developed in the Perm, Nizhny Novgorod, Novgorod and Omsk Regions (Kazakbaev, 2005)). Because of a weak inflow of young personnel into the sector, entities are forced to use manpower being beyond the working age. Nevertheless, some prospects are opened by a rather large share of employees aged 20 to 39. This is a good potential, which, provided that young people stay working in agricultural organizations, can significantly improve the staffing level in the sector.

3.2. Factors affecting the formation and use of manpower in regions with agro-industrial specialization.

The specific features of employment in agriculture and the use of the manpower of the sector are determined by the specific nature of agriculture in Russia and in the Altai Region as well as the situation in which the agrarian sector is at the present stage of development. The agrarian sector is affected by a number of factors that have both negative and positive impact. The factors are listed in Table 6 and are structured by the degree of influence.

Table 6
Factors influencing the formation and use of manpower in the agrarian sector of the Altai Region

Group of factors	Specifics of the formation and use of manpower in the agrarian sector of the Altai Region preconditioned by group of factors	Group rating

1. Socio-economic	Work in the open air; use of living organisms in the labor process; special forms of organization of work collectives; one of the lowest salary levels; underdeveloped household, social, engineering and transport infrastructure in the countryside; more difficult access to medical and educational services.	0.2
2. Demographic	Outflow of young people from rural areas; urbanization; depletion of rural manpower – the main source of human capital for agriculture; high mortality of the rural population.	0.19
3. Organizational	Human resources management being a secondary matter for organizations; incompetence of top managers in personnel management; low qualification of HR staff in agricultural entities; lack of HR management specialists in many agricultural organizations; insufficient investment in improving the working conditions of employees.	0.15
4. Profession and qualification	Low level of education of managers and specialists of agricultural sector; low level of motivation for professional development; almost complete denial of agro-classes in rural schools.	0.12
5. Political and legal	Implementation of regional target and departmental programs for development of agriculture, personnel sourcing in various sectors of the economy, development of rural areas.	0.10
6. Scientific and technological	Low rates of renovation of the material and technical resources in agriculture in the Altai Region; obsolete agricultural machinery in many organizations; unpreparedness of personnel to operate new equipment.	0.09
7. Economic and geographical	Harsh climatic conditions for agriculture in the south and south-west of the region; location of many agricultural areas in the zone of risky farming; shift of the able-bodied population into the non-productive sphere of the economy.	0.06
8. Ideological and moral	Falling prestige of agricultural work; perception by rural youths of education as an attribute, a way to change the place of residence, but not a condition for the formation and use of good quality manpower; persistence of traditions in the countryside, conservatism of rural residents; a missing system of labor education and career guidance.	0.05
9. Ecological and natural biological	For the formation and use of manpower, there are rich natural and recreational resources, creating conditions for the restoration of efficiency; the population of the region can be provided with more than 80% of basic local-made food products.	0.04

Among political and legal factors, there are some concerns about the authorities' desire for the simultaneous development of both small farms and large integrated complexes in the same subsectors of the agro-industrial sector. Large well-equipped farms have access to both significant investment resources and modern technologies of cultivation, logistics complexes, processing facilities. They have established ties with consumers. Farmers in these conditions are losing in the competition, which can ruin their farms. The state, giving out loans to small farms at preferential interest rates, could provoke a crisis of non-payments in the countryside,

because rural businessmen cannot compete with large manufacturers. The main difficulty is to maintain the balance of simultaneous support of both agricultural holdings and rural businessmen, since there is a risk of creating a situation, where large manufacturers will occupy monopolistic positions in the regions and start dictating prices and conditions, thus possibly losing the motivation to improve production.

Another difficulty is a small opportunity to raise prices due to weak differentiation of products. The parity of prices for agricultural products and production facilities for agriculture varies from year to year, not in favor of the agricultural sector, and the tendency to outstripping growth of prices for industrial products can be traced both in the whole country and globally. The government's move away from the policy of regulating inter-industry proportions has led to a growing level of inequivalent exchange between agriculture and manufacturing. It should also be noted that the increase in prices for agricultural products is largely constrained by low paying capacity of the population, imperfect market infrastructure and a lot of intermediaries on the way to delivering products to end-users.

The investment in manpower is constrained by the influence of economic and geographical factors, since the regions of Russia are in different climatic and geographical conditions (Lukashevich, 2008): some benefit from proximity to the center and considerable financial support, others, for example, the Altai Region, do not have the opportunity to establish prices for products being adequate to the costs. In such conditions, not all agro-enterprises can reach a high level of profitability and receive significant profits. As a consequence, not all have the conditions to ensure decent remuneration for work, development of the social sphere, programs to attract and retain personnel. All this, in turn, affects the labor motivation of employees, the image and attractiveness of agricultural organizations as employers. Here, it is necessary to take into consideration the low efficiency of production (although it grew by 26% over the past six years), high capital and energy intensity, long payback periods (on average, 7-8 years), as well as uncertainty of businesses in the stability of the agricultural market (Gordeyev, 2010). This forces agrarians to conduct their business "here and now", implement a survival strategy, focus on quick profits, and this policy, as is known, pushes the issues of personnel management and human resources development to the background. Certain hopes for increasing the relevance of the issues of formation and use of the manpower of the sector are caused by the fact that since the early 2000s the share of profitable agricultural enterprises has grown to 42%, the profitability has increased from 6.7% in 2000 to 14.5% in 2010, the production volume has risen by 33%, the revenue has increased almost 3 times (Kundius, 2010). If the upward trend continues, the issue of personnel sourcing will inevitably become more acute, since this is personnel which unites all the factors of production and expands the prospects for development.

Organizations of the agrarian sector are forced to act in continuously changing conditions, in a situation of risk and uncertainty, which complicates planning and forecasting. This feature is reflected in the personnel management of the sector: plans for the formation and use of manpower depend mainly on the results of economic activity and whether it will be possible to find funds for this type of activity. The impact of external and internal factors forces the sector personnel to occupy a secondary position, highlighting the issues of survival, financing, material and technical facilitation.

Among the economic and geographical factors, especially worth highlighting are the natural and climatic conditions, working in the open air, use of living organisms in the labor process. All the above has a strong impact on the willingness to be engaged in agricultural work, i.e., on the inflow of human capital into the sector, and explains the uneven demand for personnel in agriculture in connection with the seasonality. Consequently, part-time employment is observed, namely, incomplete working year. These characteristics make agricultural labor unattractive and unaesthetic, put the effectiveness of manpower use in dependence on the season, weather and quality of land, overall sanitary and hygienic conditions of work.

Similar problems are partially solved by updating the material and technical facilities,

introducing new technologies, but in the Altai Region the processes of mechanization, automation and renewal of agricultural machinery are extremely slow. Thus, according to the data of the Main Directorate of Agriculture (MDA):

- 85% of power-operated thrashing floors depreciated a few years ago and are not compliant with the current requirements;
- agricultural enterprises are operating machinery and equipment purchased in the early 1990s. 94% of tractors and 83% of harvesters are beyond depreciable life causing continuously growing costs on repairs and spare parts;
- new machinery and equipment are falling behind those retired and written-off. Since 2004, the replenishment of machinery and tractors was 0.5-1.5% in average while MDA's norms provide for 10-12%;
- livestock and poultry farms are very worn out with milking equipment, cellular batteries, there is a shortage of milk cooling tanks and feeders. All of the above leads to a decrease in productivity, a drop in product quality, an increase in labor costs, and an increase in feed and repair.

Obviously, in such conditions it is problematic to implement measures to attract and consolidate agrarian personnel, to develop human capital, especially such components as health, motivation, and professionalism. Agriculture today employs the manpower relevant to the quality and level of jobs and working conditions.

It is worth noting that working conditions in agriculture are often dangerous. According to the International Labor Organization, agricultural employees are among the three groups of personnel most being at risk (along with miners and builders). Out of the 350,000 fatal on-the-job accidents that are recorded annually in the world, approximately half of them occur in agriculture: employees in this sector are exposed to toxic pesticides, potentially dangerous equipment, diseases transmitted by agricultural animals, and injuries resulting from operating machinery. At the same time, the average level of labor remuneration in agriculture in Russia is more than 2 times lower than the country's average (the average nominal wage in Russia as on the beginning of 2014 was 29,940 rubles against 10,737 rubles in agriculture). In the Altai Region the lowest wages are in agriculture, and even taking into account the income from personal part-time farms, the incomes of rural residents are 1.2 times lower than those of urban households. If we turn to the structure of costs for agricultural products, the share of wages in it decreased from 33.4% in 1990 to 22.1% in 2014. For comparison, see Table 7 (Territorial Body of the Federal State Statistics Service in the Altai Region, 2016b).

Table 7
Average monthly wage of the Altai Region
by kinds of economic activity, rubles

Kinds of economic activity	2011	2012	2013	2014	2015
Agriculture	9,638	11,190	13,207	13,919	15,717
Construction	13,555	14,921	17,394	18,713	17,642
Wholesale and retail	10,139	12,409	14,150	14,492	17,894
Finance	33,460	36,550	38,423	38,622	38,954
State administration	21,860	27,642	31,154	32,557	32,293
Region's average	13,823	16,010	18,011	19,456	20,090

Given that the subsistence minimum per one able-bodied person in the region is just over

9,200 rubles and a little more than 8,900 rubles per a child, the wages of the personnel of the agrarian sector are insufficient for full restoration of working capacity and ensuring an acceptable level and quality of life for agrarian staff and their families. But a serious shortage of current assets, as well as high accounts payable (on average, about half the annual revenue from the sales in the region) do not allow agricultural organizations to increase the incomes of employees. Consequently, socio-economic factors also are not lining up in favor of the manpower of the agrarian sector.

The agriculture of the neighboring regions – Kemerovo, Novosibirsk, Omsk, Krasnoyarsk Regions, etc. – is also marked by low wages. For example, in the Novosibirsk Region, according to the data for 2014, the average salary of agricultural workers was 13,984 rubles, which was the lowest figure among all economic activities. In the Omsk Region, the wages of agrarians were at the level of 11,000-13,000 rubles per month, in the Krasnoyarsk Region – slightly more than 15,000 rubles per month, while the average salary for the Siberian Federal District in 2015 was 25,721 rubles.

Among the professional qualifying factors determining the features of the formation and use of manpower in the agricultural sector, worth noting is the lack of narrow specialization of labor owing to several circumstances. First, the specifics and content of agricultural production impose high requirements on manpower's professional component: a wide range of knowledge and skills, competence in various fields, ability to solve production-related problems in several adjacent areas. Second, the problems of personnel sourcing, faced by many agricultural enterprises, force employees to master related professions. Third, the development of agricultural holdings and the growing interest in agriculture by large investors require highly skilled workers, but employers keep noting the insufficient level of training in young professionals and workers. This gap can be eliminated by orientation towards experienced, professionally proven employees who are being involved in part-time work and are being trained in related professions. Moreover, the reduction in the number of qualified managers and specialists in the agrarian sector in the Altai Region is accompanied by restoration and establishment of new agricultural entities through targeted and departmental programs, and this, in turn, leads to a decline in the staffing level of agriculture. As a consequence, agriculture saw a decline in the overall professional level of managers and specialists.

The lack of educational and qualification level was noted by CEOs of agricultural enterprises during our research, the reasons rooting in many respects in the system of agricultural personnel training. According to CEOs of agricultural enterprises, the main problems that reduce the efficiency and quality of training of agricultural personnel are:

- obsolescence of the traditional class-and-lesson system, which does not allow building professional competencies at a sufficient level;
- lack of a system for continuous training of agricultural personnel and continuity of educational programs at various levels; as a result, students who continue their education in higher schools with higher levels of training are forced to re-master the material they have already studied rather than go deep into the profession;
- weak practical preparedness of graduates due to the lack of practice-oriented training;
- insufficient material and technical facilitation of educational institutions, which does not allow forming the skills required by today's agricultural manufacturing;
- imperfection of targeted training of agrarian specialists for particular enterprises and areas, non-fulfillment of agreements for targeted contractual preparation.

In addition to these groups of factors, one of the strongest influences on manpower formation in the agricultural sector is exerted by the demographic factors. Doing an analysis of the current state of the personnel sourcing in the sector, we noted that countryside was characterized by a more critical state of demographic processes than cities. High rates of population decline, mortality rates, including child mortality, – all that worsens the reproductive basis of manpower (Table 8) (Territorial Body of the Federal State Statistics Service in the Altai Region, 2016a).

Table 8
Indicators of fertility, mortality and natural population growth in the Altai Region, persons

Years	Urban population			Rural population		
	births	deaths	natural growth/decline	births	deaths	natural growth/decline
2011	16,160	17,509	-1,349	14,545	17,599	-3,054
2012	17,634	17,848	-214	15,245	17,284	-2,039
2013	17,678	17,181	497	14,515	16,706	-2,191
2014	17,335	17,220	115	14,097	16,751	-2,672
2015	17,693	17,415	278	12,387	16,246	-3,859

The main causes of mortality are diseases of the cardiovascular and circulatory systems, as well as neoplasms and tumors. They account for 66% of all deaths. In rural areas, high rates of morbidity and mortality are exacerbated by inaccessibility of qualified medical personnel, diagnostic, curative and preventive services. Thus, the existing health care system does not provide the conditions for the reproduction of manpower.

It is also important to say about ideological and moral factors, exerting indirect influence. Agriculture is a bearer of certain national traditions and culture, which is reflected in specific management organization in the agrarian sector: the differences between town and country, the persistence of traditions, customs and way of life in the countryside, the influence of households on the economic situation of families are taken into account. That is why it is possible to note one more characteristic: rural employees are especially linked with the foundations of life and work, having a special structure of motivation, and therefore possessing some conservatism both at work and in the household sphere. This means that agricultural employees are slower to adapt to novelties, have a longer period of resistance to novelties, which, in turn, affects the speed and effectiveness of innovation.

4. Discussion

Discussion about the current staffing level of the agrarian sector would be incomplete without an assessment of the value of human capital, integral to the above (Danchenko-Morozova, 2013). On the basis of the cost method (Kameneva, 2011), the value of human capital was estimated over five years (Table 9).

Table 9
Estimation of the cost of human capital in the agrarian sector of the Altai Region (2010-2014), billion rubles

Expenditure	2010	2011	2012	2013	2014
Labor costs (based on average wages in agriculture)	1.4	1.6	2.1	2.3	2.7
Expenses for training of agricultural personnel (classified as core production personnel)*	0.6	0.71	0.79	1.09	1.28

Expenses for improving working conditions (based on average costs of entities)	0.48	0.43	0.40	0.35	0.31
TOTAL	2.48	2.74	3.29	3.74	4.29

Note: *Based on the average costs of training of one specialist in agriculture (positions related to core production personnel) in higher school; including the funds of regional and departmental target programs; including the funds of regional consolidated budget for financing primary and secondary education (in proportion to the number of students learning professions of the agricultural profile).

As Table 9 shows, the increase in the cost of human capital is due to the growth of nominal wages and an increase in the expenses on agricultural education in the Altai Region, along with falling expenses on improving working conditions. It is important to note that it is the creation of conditions to return and consolidate personnel which is the most important factor in the long-term sourcing the sector with manpower. To date, given that the level of personnel retention in agricultural entities is on the average equal to 18%, it can be said that only a fifth of all investments in manpower formation is justified and brings returns.

In discussing the personnel sourcing in the sector, an important role is given to the measures by regional authorities and the content of regulations aimed at supporting the agro-industrial complex and agriculture. The analysis of the documentation base ("On Improving Personnel Sourcing of the Agro-Industrial Complex", 2000; "On Development of Agriculture in the Altai Region", 2008; "Development of Agriculture of the Altai Region for 2013-2020", 2012) allowed the following conclusions:

- 1) great importance is assigned to the measures in connection with attraction and retaining personnel in the countryside, developing human resources and creating new jobs. This is fair, because on average about 40% of graduates of the Altai State Agrarian University, about 7% of graduates of agricultural technical schools and colleges and about 8% of graduates of vocational schools and lyceums are employed in the agricultural organization of the region (Sychev *et al.*, 2015), despite the fact that the system of training personnel for the region's agricultural sector comprises 1 university, 9 specialized secondary educational institutions, 34 vocational schools, while the annual number of agrarian graduates with primary education averages 1,455, secondary – 512, higher – 749 people;
- 2) state support for managers and specialists in agriculture is carried out at the expense of the federal and regional budget funds allocated for attracting and retaining employees, as these two methods constitute the primary source of human capital inflow into the sector. State support is provided in the form of annual gratuities paid during the first two years of work, as well as funds from the regional budget for construction or purchase of housing;
- 3) the issues of the formation of manpower in the agrarian sector are solved on the basis of a program-targeted approach with a focus on material stimulation of employment, which so far does not bring the declared results and does not solve the problem in the long term. In our opinion, it is necessary to create a regional mechanism for the formation and use of manpower in the agricultural sector of the economy with the participation of all interested parties not relying solely on monetary injections. Until now, the problem of complex interaction between the state and regional government bodies, educational and business entities has not been solved.

Our study of the state of manpower in the regional priority sector of economy has shown that for almost two decades there has been a steady downward trend in the region's population, which generates the problem of manpower reproduction both at the regional and sectoral levels. Due to insufficient and unplanned career-oriented work, unrealistic expectations are formed among young people, which do not correspond to the requirements of the agrarian labor market. Students studying in the agrarian areas have a misunderstanding of their future

profession and misconceptions about job opportunities and careers. Young specialists, as well as future graduates, among the main factors that make labor in agriculture unattractive, call low wages, underdeveloped social and household infrastructure and engineering infrastructure in rural areas, unsatisfactory living conditions, lack of leisure and recreation, unfavorable working conditions and obsolete material and technical facilities in organizations. At the same time, for young people, according to the survey, an employment in agriculture gives a number of advantages, such as maintaining health, opportunities to build a career in the chosen specialty, ability to make savings on many expense items, less stress and less psycho-emotional load.

The problems of the formation and use of sectoral manpower are exacerbated by the lack of planned, systematic and qualitative work of HR services in agricultural enterprises. HR specialists are characterized by a low level of education and qualification; there is practically no inflow of young staff at the administrative level. It is interesting that there is a contradiction in the staffing issues in the agrarian sector: employers do not want to take an active part in training of agrarian personnel, but expect their inflow into the industry in the required quantity and quality.

5. Conclusion

The opinions and facts presented in the paper allow formulating a number of final provisions:

- 1) many factors influence the formation and use of manpower in the agricultural sector, among which there are harsh working conditions, weak development of social and engineering infrastructure in the sector, outflow of young people from rural areas, and low labor productivity;
- 2) demographic factors exert the strongest influence on the formation of manpower in the agricultural sector of the Altai Region. High rates of population decline and mortality rates, including child mortality, worsen the reproductive base;
- 3) the need to reduce the negative impact of external and internal factors puts the manpower of agricultural organizations on a secondary position, highlighting the issues of survival, financing, material and technical support;
- 4) material and technical renovation, mechanization and automation processes, introduction of new technologies in the agricultural sector of the Altai Region's economy are extremely slow. That undermines the attraction and consolidation of agrarian personnel, the development of human capital, especially such components as health, motivation, and professionalism;
- 5) wages in agrarian organizations of the Altai Region are at the lowest level. In the structure of production costs, their share is about 22%. Material benefits for the employees of the agricultural sector are not sufficient to fully restore their working capacity and ensure an acceptable level and quality of life;
- 6) agriculture is marked by a decline in the overall professional level of managers and specialists. The main problems that reduce the effectiveness and quality of training of agrarian personnel include: obsolescence of the traditional class-lesson system, lack of a system of continuous training of agricultural personnel, weak development of practical skills for graduates, insufficient material and technical facilities of educational institutions, inadequacy of targeted training of agricultural specialists;
- 7) the speed of introducing innovations and implementing measures for intensive development of the agricultural sector is indirectly affected by ideological and moral factors. Due to the specifics of traditions and culture and attachment to the foundations of life and work, rural residents have a special motivation and some conservatism.

A paramount subject for further research should be the search for effective, expedient, workable areas to improve the formation and use of manpower in the agricultural sector of the economy and for the ways to bring supply and demand into the balance in the agricultural labor

market (Sy, & Tinker, 2010). It seems promising to divide the measures into two groups depending on the level of manpower use: at the sectoral level, it is necessary to implement some measures for the formation and reproduction of manpower, and at the organizations' level – to solve the problems of its effective use through recruiting and retaining personnel. Taking into account that the tasks of different levels are linked by a single goal – achievement of high performance in agriculture and improvement of manufactured products' quality by enhancing the quality of work and improving the personnel sourcing in organizations – the methodology embodied in the idea assumes integration of efforts by economic entities of both levels with the purpose of building a unified educational, manufacturing and scientific space in the agricultural sector of the economy (Addison *et al.*, 2014).

The data presented in the article, conclusions and directions for further discussions allow solving a number of theoretical and methodological issues in studying manpower and human resources potential in agriculture, the specifics of their formation and use. In the future, the results of the study have the prospect of development, supplementing and distribution for solving the problems related to the formation and use of manpower in other sectors of the economy.

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