

THE MAIN LABOR-FORMING FACTORS AND THE ASSESSMENT OF LABOR EFFICIENCY IN AGRICULTURE (BY THE EXAMPLE OF KEMEROVO OBLAST)

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Abstract: A system of factors that affect the formation of labor resources is considered. At present, quite unrelated indicators that reflect individual aspects of the labor potential are used to characterize labor efficiency. In new economic environment, it is necessary to elaborate a system of indicators that would more fully reflect the use of labor.

Keywords: labor resources, efficiency, competitive labor compensation, nominal compensation, criterion, labor productivity, demography

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INTRODUCTION

The reorganization of ownership patterns and the formation of a mixed economy in the agrarian sector require adequate changes in labor relations.

An important cause of the production decline in the agrarian sector was the inability of the rural population to adapt to market conditions due to its specific mentality.

The substantial drop in overall production and the deterioration of the demographic situation have led to a decrease in the absolute number of employees and, what is more important, to changes in their qualitative composition.

In our opinion, an increase in the performance of the agrarian industry is primarily determined by the availability of highly professional and economically competent human resources who are able to use new technologies in production.

We see a decrease in real labor compensations of agricultural producers, late payments, unpaid vacations, dismissals, and reduced productivity and labor motivation.

The goal is to propose and substantiate a system of labor-forming factors and to assess the efficiency of labor.

The development of market mechanisms in the agrarian sector in the absence of efficient state incentives for agricultural producers has led to deterioration in socioeconomic conditions in the industry and in rural communities as a whole.

Thus, it is necessary to analyze in detail the existing situation and to elaborate measures of increasing efficiency in the use of labor.

Market relations introduce changes to the organization, distribution, and use of labor, which manifest themselves in different ways in agricultural

businesses of different forms of incorporation. At present, agricultural production practices require new approaches to make the use of labor efficient.

We used data of the Russian Federal State Statistics Service and the Kemerovo oblast territorial statistics body for our analysis.

The paper employs the following methods:

- economic–statistical;
- monographic; and
- abstract–logical [8].

RESULTS AND DISCUSSION

Kemerovo oblast is the most densely populated region in West Siberia. More than 90% of its population is concentrated in cities and urban-type settlements.

The oblast's industrial potential plays an important role in solving economic problems of the Russian Federation. In the first place, this includes fuel and metal supplies. Since recently, the role of the Kuznetsk Basin (Kuzbass) as the main supplier of high-quality solid fuel and power-generating coals has greatly increased. The oblast has occupied a more noticeable place in providing metallurgy with process fuel and coke coals. The share of the Kuzbass in providing Russia with these fuels is 36 and 66%, respectively [3].

Let us consider the dynamics of the oblast's active population. Demographic processes underlie labor supply and determine the scale and composition of labor supply.

The growth of the working-age population has a dual effect on the labor market:

- an increase in labor supply and, consequently, an increased pressure on the labor market; and
- an increase in the number of working-age individuals somewhat mitigates the load on the working population.

The peak of demographic load in Kemerovo oblast fell on 1996 (42.6 persons younger and older than the active age per 100 persons of active age). As is known, a high demographic load requires improvement in the efficiency of social labor; however, in Kemerovo oblast and in Russia as a whole, the growth of demographic load coincided in time with the decline in production and employment, which significantly complicated the situation [3].

Trends in and dynamics of labor formation by sociodemographic groups are presented in Table 1.

One of the least competitive sociodemographic groups is women nearing pension age; accordingly, an increase in their share in labor composition will inevitably lead to the growth of unemployment and will unquestionably require retraining and further employment. At the same time, a decrease in the number and share of men of 30–49 years of age (this age is believed to be the most active) in the structure of the working-age population will negatively affect labor quality, although the possibilities of placement for less competitive population categories will widen.

Table 1. Economic activity of the working-age population in 2007–2012, Kemerovo oblast

Population group by sex	Age group's share in working-age population, %			Sex–age structure of working-age population, %			
	16–29	30–49	49–59/54	Total	16–29	30–49	49–59/54
2008 (both sexes)	26	40.5	21.4	100	100	100	100
Men	31.2	39.7	24.1	49.1	48.2	47.7	44.1
Women	34.1	43.1	18.8	50.9	51.8	52.3	55.9
2009 (both sexes)	32.9	38.7	21.7	100	100	100	100
Men	31.6	39.1	24.3	53.4	54.3	55.2	54.6
Women	31.2	38.4	19.1	46.6	45.7	44.8	45.4
2010 (both sexes)	34.4	38.8	22.3	100	100	100	100
Men	34.2	38.5	25.3	49.9	50.4	48.7	52.4
Women	34.7	39.1	19.3	50.1	49.6	51.3	47.6
2011 (both sexes)	33.6	38.9	26.4	100	100	100	100
Men	32.1	37.9	23.7	49.4	49.5	48.1	52.8
Women	34.6	38.9	23.5	50.1	50.5	51.9	47.2
2012 (both sexes)	31.6	37.5	24.3	100	100	100	100
Men	30.8	38.5	24.7	51.8	49.8	49.3	52.9
Women	32.5	36.6	23.9	43.2	50.2	51.7	47.1

The scale of the possible occurrence of different sociodemographic groups in the labor market largely depends on the causes of economic inactivity. The causes and level of economic inactivity differ by sociodemographic groups: the number of women, both overall and in each age group, is substantially lower than that of men, which is due to their engagement in housekeeping, childcare, and lower pension age. Low economic activity among the young is because of a high share of off-the-job students. A certain decrease in economic activity among persons nearing pension age is a consequence of benefits and early pensions. A considerable share of persons accounted for as economically inactive is constituted by employees of the informal economy. In case of a decrease in the living standards, it is possible to increase labor, primarily by involving students, persons nearing pension age, and housekeepers [3].

A characteristic feature of agriculture is that labor formation is affected by certain factors, which can be divided into three principal groups: social, demographic, and economic [1]. All this has allowed the authors to

propose a classification of these factors while generalizing them (Fig. 1).

During transition to the market, the compensation level somewhat affects labor formation. Note that we do not mean the compensation level as such but rather its relation to other industries and the subsistence level.

In the system proposed, the group of economic factors includes not only incomes and unemployment but also material resources affecting labor formation. All this does not diminish the import of the other groups of factors. Sociological studies show that the placement level depends on housing; medical service; and the presence of schools, preschool facilities, sociocultural establishments, and asphalt roads. Improved conditions lead to an increase in the birth rate and a decrease in the migration of the rural population.

Note that labor formation also highly depends on demographic factors, such as the birth rate, migration, and the share of working-age people in the total population [6].

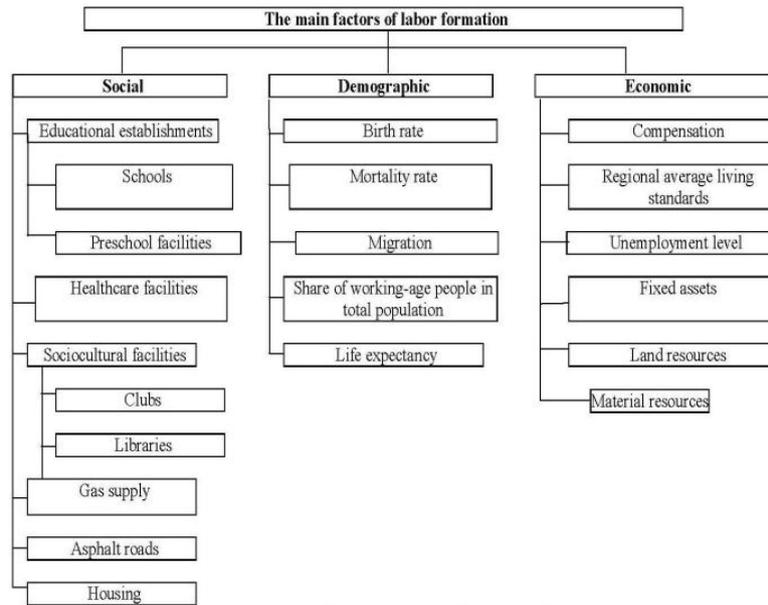


Fig. 1. The main factors of labor formation.

The above groups of the main factors should not be considered separately because the formation of labor conditions takes place under the interaction and mutual influence of all the factors [1].

The main economic factor of labor formation is compensation rate [7]. The nominal compensation indicators alone do not make it possible to study the real dynamics of these processes and to determine the picture of trends developing in the industry's economy because nominal compensation does not account either for the inflation rate or for changes in the relations of production. The real compensation indicator does not make it possible to analyze changes in personal-income dynamics by year. To accomplish this, a new indicator is necessary to account for purchasing power with regard to the possibility to satisfy vital human needs. In our opinion, it is necessary to introduce a competitive compensation indicator that accounts for the possibility to satisfy an employee's minimal needs. Hence, the authors propose to introduce the competitive compensation indicator according to the following formula:

$$I_c = I_n \frac{M_b}{M_c}$$

where I_c is competitive compensation, I_n is nominal compensation, M_b is the subsistence level in the base period, and M_c is the subsistence level in the current period.

The M_b and M_c values are determined using state statistics. The base period is the initial period of studying the dynamics (first year), while the current period is the period of calculating the nominal compensation level (current year).

The subsistence level is used as the base for calculating competitive compensation. This is predetermined by the low level of incomes and is typical for the rural population.

Table 2 shows competitive compensation calculations for Kemerovo oblast.

Table 2. Labor compensation in agriculture, Kemerovo oblast, 2008–2012

Year	Monthly average compensation, rubles		Growth compared to base period, %	
	Nominal compensation	Competitive compensation	Nominal compensation	Competitive compensation
2008	8481	7210	–	–
2009	9124	8225	109	114
2010	9964	8652	117	191
2011	10645	9084	125	128
2012	11177	9629	132	135

The above calculations show that the growth rate of competitive compensation lags far behind the growth rate of nominal compensation, and this reflects the real situation in agriculture.

Our studies have shown that the index of competitive compensation also reflects more accurately the relation between personal incomes and the net results of production.

It is necessary to point out that the performance of labor resources is characterized by unrelated indicators, which do not reflect all facets of labor use. Market conditions necessitate the development of a system of indicators that would reflect more fully the use of the labor potential and show interrelation between them. This system can be represented as a totality of indicators that includes the employment rate of the working population and the development of the labor potential. The efficiency criteria of and the major approaches to the determination of the indicators should be uniform. Practical calculations should take into account characteristics related to various forms of business incorporation.

The present period is characterized by a more complex employment structure due to the diversification of its social groups and flexible organizational forms. All businesses should be regarded efficient if they ensure the socially necessary employment rate in combination with high performance indicators [2].

The development of market relations contributed to the formation of various forms of businesses in Kemerovo oblast. On January 1, 2013, the oblast had 14 joint-stock companies (JSCs), 12 closed joint-stock companies (CJSCs), 8 state unitary agricultural units (SUUs), 112 limited liability companies (LLCs), 44 agricultural production cooperatives, and 218 private incorporated farms. Joint-stock companies, self-sufficient in factors of production (the capital/labor ratio in JSCs is 21.1% higher than in other agricultural units on average), take the leading position in terms of labor and capital efficiency, as well as land use. Having 3.9%

of land and 8.8% of labor resources, the private farmers produce 10.2% of the oblast's total agricultural output.

The basis for the formation of the oblast's labor force in agriculture is the rural population, which decreased by 3.7% over the reporting period, and the demographic situation continues to deteriorate. The employable population is about 45%, and the share of people under the working age is decreasing; every fifth resident is a pensioner; the percentage of women among the employees in 2012 was 27.5%. The number of employees in agriculture decreased by 16.7%.

In 2008, 51.6% of the working-age rural population was employed in agricultural units, while in 2012 this figure was only 16.2%. This happened owing to the decline in production and decreased compensation. Owing to the development of market relations, the structure of employees in agricultural production changed (Table 3).

Table 3. Employment in the agricultural organizations of Kemerovo oblast

Forms of incorporation	Share of employees in their total number, %		Annual employment, man-hour		Number of employees per 100 ha of tillage	
	2008	2012	2008	2012	2008	2012
On average by agricultural forms of incorporation	–	–	1940	1957	3.3	2.7
Collective farms	22.8	6.3	1821	2174	2.5	2.3
SUUs	12.6	7.3	1931	1862	2.0	2.4
LLCs	2.1	16.7	1600	1584	0.8	0.9
JSCs	8.6	4.6	1793	1802	7.2	3.7
Agricultural production cooperatives	28.6	23.2	1605	1980	1.8	1.9
Farms	13.4	17.3	1721	1780	1.8	1.6

The largest share of employees in 2012 fell on LLCs, 16.7%; agricultural production cooperatives employed 23.2%; and collective farms and SUUs, 13.6%. No significant changes occurred in the composition of labor resources during the reform period. The number of permanent employees is growing, and the share of temporary and seasonal workers is decreasing. The number of farm unit managers and specialists decreased by 10.3%, and the number of young specialists dropped by 43.4%. The growing share of chief specialists with higher education diplomas can be regarded as a positive trend (by 71.4% in the total number of administrative personnel). At the same time, the qualifications of crop production and livestock employees remain low; respectively, only 42.4% and 20.2% of them have special qualifications. Only 53.2% of private farms have certified agricultural specialists. The turnover rate of personnel has a steady trend to grow, reaching 0.62 in 2012.

The rate of remuneration in the oblast's agriculture is the lowest compared to other industries. Thus, in 2012 it was 46.4% of that in industrial production and 56.3% of that in the oblast's economy. Labor remuneration is predetermined by the low labor productivity and skills of employees. We should note that the growth of labor remuneration surpasses labor

productivity in agriculture. Agricultural units experience the excess of actual working time over its normative fund with a downward trend. In incorporated private farms, labor resources mismatch production output. Thus, the annual demand for labor at an average private farm is 41.5% of the labor resources available.

The employment and qualitative composition of labor resources affect the efficiency of their use.

The roundup indicator of the efficiency of utilization of labor resources is labor productivity. Our analysis shows that the existing concept of labor productivity and the practical methodology of labor productivity calculation have a number of drawbacks and do not fully meet the requirements of the new economic conditions [4].

In the authors' opinion, there is a practical necessity to extend the existing system of labor productivity indicators. It is advisable to represent this system as a totality of specific indicators, to determine which the following should be used:

- one resource applied;
- several resources (labor and capital), i.e., multifactor;
- all resources applied, i.e., overall indicators.

For the overall evaluation of the efficiency of economic decisions made in the presence of alternative solutions to use interchangeable resources, the use of multifactor and overall labor productivity is of

paramount importance.

This methodology allows us to determine factors

that affect most substantially the efficiency of utilization of labor resources (Fig. 2).

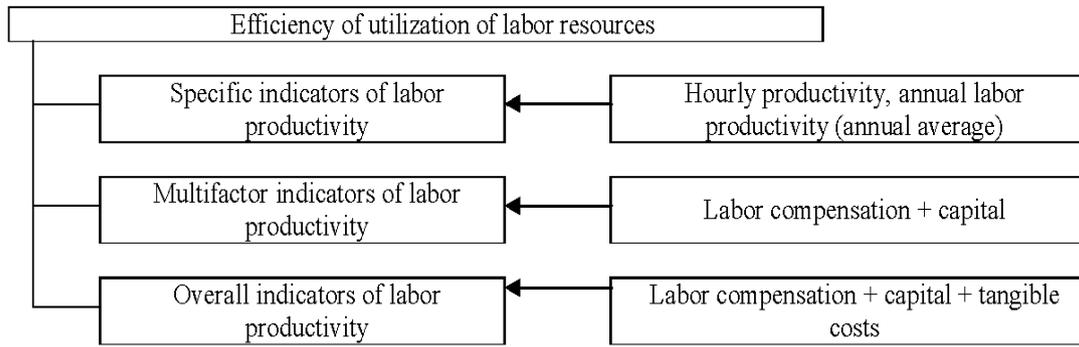


Fig. 2. System of labor use efficiency indicators.

Figure 2 shows that the multifactor indicator of labor productivity characterizes the most efficient labor and capital utilization in money terms. The specific indicator of labor productivity reflects production output per cost unit of direct and materialized labor. The overall indicator of labor productivity is the ultimate indicator of the efficiency of all resources used in production.

The efficiency of utilization of labor resources by forms of incorporation in Kemerovo oblast is given in Table 3.

As was stated above, labor productivity is decreasing in the oblast's agricultural units. Its absolute level in these units is very low. The highest labor productivity in 2012 was recorded in collective farms, 21.8% above the average. Productivity is reflected most fully in an indicator calculated by gross income, which excludes the influence of the material intensity of production. Taking into account the price index, labor productivity in agricultural units increases insignificantly, 5.4% a year [5].

A characteristic feature of agricultural production is that the units spend part of their gross output for technical needs. Therefore, the authors suggest that labor productivity be calculated both by gross output and by commercial output, which directly affects financial results. The calculation of labor productivity in comparable prices not only by gross output has a number of drawbacks, because these products contain the value of production labor. In addition, gross output is affected by the ratio of direct-to-materialized labor. In our opinion, to calculate labor productivity, it is necessary to use the indicator of net output instead of gross output, which will make it possible to exclude the repeat count of material costs. In practice, agricultural units calculate the actual marketed or net income, i.e., gross income.

We studied the influence of labor supply on the productivity and efficiency of agricultural production in Kemerovo oblast (Fig. 3).



Fig. 3. Forms and levels of labor supply.

Table 4. Labor utilization efficiency

Formation name	Specific productivity						Multifactor productivity–income–gross income per ruble of compensation and amortization, rubles		Overall productivity–gross output per ruble of current costs, rubles	
	gross output per man-hour, rubles		gross income per man-hour, rubles		gross output per employee, rubles		2008	2012	2008	2012
	2008	2012	2008	2012	2008	2012				
Average for agricultural organizations	68.6	71.4	16.2	19.9	18798	22356	5.23	5.49	4.20	4.46
Collective farms	61.3	64.2	14.8	24.1	17400	21200	4.9	5.1	3.9	4.02
SUUs	61.2	64.3	12.2	14.1	13200	16600	4.4	4.1	2.1	2.2
LLCs	34.5	88.6	9.4	11.2	16600	18900	4.9	5.1	2.8	3.1
JSCs	34	58	12	18.9	13600	21200	3.8	4.76	3.54	4.65
Agricultural production cooperatives	74	71.5	12	21	19150	18440	4.4	5.02	4.88	4.87
Incorporated private farms	147.0	132.0	36.6	29.8	46440	37800	9.02	8.87	8.02	7.79

Our analysis of labor formation and use in agriculture yields the following conclusions.

The Russian economy sees positive changes, even if slow. The reviving production sector needs professionals, but the general qualification level of hired labor has significantly decreased over the past decade. According to the Kemerovo Oblast Council of Employers, highly qualified workers in the total number of employees in the oblast's enterprises are no more than 16%, their age exceeding 50 years.

Note that the use of the gross output indicator for determining labor productivity in the agrarian sector does not provide a full and, importantly, objective idea about the efficiency of labor costs. This is predetermined by the inherent drawbacks of this indicator, such as double count, a downward bias in evaluating nonmarket output, the impact of materials consumption, and others. The above factors distort the evaluation of the productivity level and dynamics and do not favor a decrease in materials consumption and an increase in product quality.

In the authors' opinion, the most optimal way of determining labor productivity is by net output, which reflects the cost, newly created by this labor, and does not contain double count and tangible costs.

The calculation of labor productivity using the net output indicator will reflect the real efficiency of labor costs in a specific individual farm, which, under modern conditions, makes the above indicator of primary importance among the indicators of labor performance.

From 1990 through 2005, the cultivated area in the oblast's large and medium-sized agricultural units decreased compared to 1990 by two times; the cattle stock, by 5.1 times, including 4.6-times decrease in the cow stock; and the pig stock, by 2.6 times.

The economically active rural population tends to decrease. From 2008 through 2012, the Kemerovo oblast's rural population decreased by 10 800 people

(14.7%), and the number of employees in agricultural production was 59 600 people, having decreased compared to 2008 by 11.4%.

The number of the registered unemployed decreased from 6400 people in 2008 to 3200 in 2012. Total unemployment in the oblast's rural communities in 2012 was 6.1% compared to 8.7% in 2008.

Characteristic features of labor organization and utilization in agriculture are predetermined by the nature of labor relations, which should correspond to the biological characteristics of this industry:

- seeking to create the appropriate conditions for the formation of biological factors of production, living organisms, etc.;
- a direct relationship between labor efficiency indicators and natural–climatic conditions, for example, soil fertility;
- the universality of many employees, i.e., overlapping several labor functions;
- a certain explicit dependence of an employee's income on the ultimate economic results; and
- the simultaneous use of the labor potential at personal subsidiary farms and in public production.

Labor compensation in agriculture in 2012 was 36.6% of that in industry and 46.2% of that in the oblast economy, which is the lowest indicator compared to other industries.

In the authors' opinion, depending on the managerial objectives of a specific agricultural unit, it is necessary to extend the system labor productivity indicators. It is advisable to reflect this system as a set of indicators that are derived from the following:

- one resource applied,
- several resources (multifactor), and
- all resources applied.

This method will make it possible to reveal facts that would affect significantly the efficiency of utilization of labor resources.

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