

## МОДЕЛІ ТА МЕТОДИ ВИВЧЕННЯ ЕКОНОМІЧНИХ ЯВИЩ

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### FORMATION OF THE INDICATOR SYSTEM TO ASSESSMENT OF RECONSTRUCTION AND USE OF HUMAN CAPITAL IN AGRICULTURE

Узагальнено методичні підходи зарубіжних та вітчизняних вчених щодо оцінювання відтворення і використання людського капіталу у сільському господарстві та узагальнено їх позитиви й недоліки. Запропоновано оцінку формування та використання людського капіталу проводити на основі визначення прибутковості людського капіталу, зокрема, розрахунку отриманого доходу на людський капітал, який дозволяє визначити його вартість. Доведено необхідність проведення аналізу формування й використання людського капіталу на основі комплексної системи показників із урахуванням впливу численних економічних, соціальних та інституціональних відносин. Обґрунтовано систему показників за такими групами: перша характеризує формування людського капіталу, друга – ефективність його використання, третя – взаємозалежність між різними показниками цих груп.

Систематизовано чинники, які впливають на значення показників відтворення та використання людського капіталу, а також визначено можливості їх розрахунку, враховуючи існуючу інформаційно-аналітичну базу сільського господарства. Доведено, що підсистема показників формування людського капіталу дозволяє охарактеризувати процес відтворення людського капіталу на основі розрахунку кореляції між якістю людського капіталу і якістю життя. Наголошено, що аналітичні розрахунки за цією підсистемою мають стати базою для визначення напрямів розвитку соціальної інфраструктури, розрахунку економічної ефективності інвестицій у людський капітал та обґрунтування напрямів формування підприємницьких здібностей і лідерства у сільського населення.

Доведено, що дослідження продуктивності використання людського капіталу доцільно проводити через розрахунок ефективності інвестицій у людський капітал та порівняння одержаних значень із їх віддачею в інших сферах економіки, а також на основі розрахунку ефективності використання людського капіталу в часі й просторі. Очевидно, розрахунок показників ефективності використання людського капіталу здійснюється з урахуванням одержаного фактичного результату на одиницю людського капіталу, з подальшим детальним аналізом його динаміки, факторів, що впливають на його абсолютні й відносні величини.

Автором доведено, що нинішні умови вимагають проводити оцінку інноваційності людського капіталу сільського господарства із обов'язковою ідентифікацією основних чинників та форм їх впливу на процеси організації наукової та інноваційної діяльності в системі. Доведено, що показник вкладу людського капіталу у зміну інноваційного потенціалу сільського господарства характеризується ступенем впливу капіталу підготовки, капіталу здоров'я та капіталу соціальної ідентичності на організацію процесів наукової та інноваційної діяльності та визначається рівнем створеної доданої вартості групи за рахунок: ефективності обміну інформацією досвіду, знаннями між працівниками галузі; ефективністю участі працівників сільського господарства у запровадженні різних форм інновацій; рівнем готовності до прийняття ефективних інноваційних рішень працівників галузі; рівнем кількісної характеристики впливу людського капіталу на результати наукової та інноваційної діяльності в сільському господарстві.

**Ключові слова:** людський капітал, відтворення людського капіталу, ефективність використання людського капіталу, інноваційність людського капіталу.

**Formulation of the problem.** It is known that the development of the human capital of agriculture, the improvement of its qualitative and quantitative characteristics is a very important factor in ensuring sustainable development of rural areas and the economy as a whole. Proof of this is the fact that, other things being equal, an agricultural worker possesses a considerable capital of knowledge, skills, abilities for labor and creative activity, more efficiently develops new technology, new technologies and ultimately ensures high efficiency of agricultural production. In developing methodological approaches to assessing the reproduction and use of human capital in the agrarian sector should take into account not only the general features of the phenomenon under study, but also the peculiarities of the environment in which it is formed and functioning.

It is known that the formation and use of human capital is carried out under the influence of inter-related factors, which can be characterized only by an integrated system of interrelated indicators. It is obvious that investments in a person during his life form the prerequisites and conditions for increasing their life expectancy, because now in the Ukrainian economy the rural population is often lost due to traumatism, alcoholism, epidemic diseases, insufficiently qualified treatment, irrational mode of work and rest, unsanitary living conditions, serious environmental problems of the environment.

At the present stage of agricultural development, there is a need to justify methodological approaches to the evaluation of human capital, since it is the labor force that is the main capital that creates the prerequisites for the economic growth of the industry. The generalization of economic literature made it possible to establish that the questions of assessing human capital were concentrated in a sufficiently large number of works, both domestic and foreign [1, pp.16-26; 2; 3, p. 221-225; 4, p. 61-64; 5, p. 119-122]. Their analysis shows that there are different approaches to assessing the reproduction and use of human capital, but there is no integrated approach, including the assessment of human capital in agriculture.

**The purpose of the article is** to generalize approaches to assessing the value of the human capital of agriculture and to justify the complex system of portraying the formation and reproduction of the studied area.

The development of the system of indicators will be carried out on the basis of the following conditions: the number of indicators should not be expanded to make it difficult to interpret and collect primary information; the established system of indicators should be flexibly adapted to the existing statistical information that is formed in the field of agriculture; it is advisable to identify the indicators that have the greatest informative value and importance for the formation and development of human capital in terms of its impact on the economic growth of the industry.

**Methods of research.** The methodological basis of the research is a set of general scientific and special research methods, among which it is necessary to distinguish the following: methods of analysis and synthesis, dialectical, systemic – to study the theoretical foundations of human capital; classification-analytical method – to identify the components that affect the processes of reproduction and use of human capital in agriculture; economic-mathematical methods – for calculating the integral index of the value of the aggregate capital of agricultural enterprises.

**Results of the study.** The generalization of scientific works of domestic scientists made it possible to establish that they consider the formation and use of labor potential and, to a lesser extent, human capital, which calls for an analysis of existing problems and the development of a broader list of indicators. A complete quantitative and qualitative description of the reproduction and use of human capital can only provide a comprehensive system of indicators. The remarkable thing is that, foreign scientists also characterize the process of reproduction and use of human capital system of indicators [6, p. 53-64; 7, p. 495-509]. So, the ISO 9000 quality standards, the social standard SA 8000 and other standards of economic relations, the humanization of production processes and their influence on human capital are developed.\* In this case, the HDI is characterized by such categories as, first, the effectiveness of human activities; secondly, the equality of opportunities to use abilities, to receive benefits; thirdly, the stability of economic and social development; Fourthly, these are opportunities for satisfying the interests of people. For each direction it is proposed to use groups of indicators, quantify the state and use of human capital [8, p. 77-104]. Such approaches are undoubtedly rational, but in the aggregate of these indicators it is very important to have an indicator that would characterize the value of human capital, since without it it is impossible to perform calculations with its growth and productivity of use. For the first time an attempt to conduct a monetary valuation of human capital for the first time in the XVII century. made the distinguished English economist W. Petty [9]. In the Soviet economic science, the idea of a monetary evaluation of the human factor belongs to academicians AI Anishin, SG Strumilin, T.S. .. Khachaturov, and in modern agrarian economics – O.M. Borodina, L.I. Mikhailova, L.A. Marmul [10; 11; 12]. It should be noted that several approaches have been developed by calculating the amount of fixed capital necessary to compensate one employee; by applying a system of indices that characterize the quality of human capital; carrying out of complex estimation of aggregate potential through use of correlation-regression analysis; finally, the method of capitalization of employee income.

\*The Human Development Index (HDI) of the United Nations Development Program. Index of pleasure is the quality of life LCJ.

Of course, each of the above approaches contains rational grain, but it has drawbacks because it does not take into account the characteristics of human capital such as age, duration of work, health, the formation and composition of the family, different forms of income, the correctness of wage determination, experience and many others. Indicators that characterize human capital. Undoubtedly, the methodology for calculating the human capital valuation will be developed and improved. In our opinion, the assessment of the formation and use of human capital should consist of two stages, namely: in the first stage, on the basis of correlation-regression analysis, the profitability of a factor such as human capital, which can be characterized in the model by the number of employees with the corresponding qualification correction, experience, health and other indicators that characterize it; at the second stage, the income earned on human capital can be translated according to the capitalization formula into the cost of human capital in the following way:

$$ЛК = \frac{Дл \times 100\%}{HC\%}, \quad (1.1)$$

where ЛК – value of human capital, UAH;  
 Дл – annual income on human capital, UAH;  
 HC% – rate of interest.

Note that the complexity of calculating this indicator lies in the fact that it is necessary to calculate the annual income attributable to human capital.

Calculation of it is quite possible if for this purpose we apply the method of finding production functions and, as practice shows, it is expedient to use the Cobb-Douglas model, which has the following form:

$$Y = K^a \times L^{1-a}, \quad (1.2)$$

where Y – is the output of gross income, UAH;  
 K – productive capital, rub;  
 L – number of employees, people.

The proposed model allows not only to determine the normative value of gross income depending on the values of capital and labor factors, but also to find a share in the total income created by the human factor. Having received this value under the formula 1.1, it is possible to pass to definition of cost (price) of the human capital. Given the available statistical material, the calculation of the value of human capital can be carried out according to the formula:

$$ВЛК = \frac{\sum \text{ЗП} \times 100\%}{HC \text{ B} \%}, \quad (1.3)$$

Where ВЛК – cost of human capital, UAH;  
 ∑ЗП – annual amount of wages, thousand UAH;  
 HC – rate of interest, %.

According to this methodology, it is possible to calculate the value of the total capital of agricultural enterprises, as well as the cost of human capital per 1 worker (Table 1). It is meaningful that the calculation of the value (price) of human capital opens wide opportunities for solving a number of economic problems, among which highlight the following:

the ability to determine in monetary terms the aggregate value of all resources used (land, productive and human capital). This task is relevant, but remains unresolved, although the cost of human capital could be added to the capital and land value;

the availability of the value of aggregate resources makes it possible to more fully determine the performance indicators of production, the return on assets, the rate of return, the capital intensity;

when determining the value of human capital, there are opportunities to more fully determine the value of national wealth, as well as to calculate its structure. In this case, the national wealth includes not only natural resources, basic and current production assets, but also human capital.

Thus, World Bank staff J. Dickson and C. Hamilton attempted to determine the volume and structure of national wealth in the leading countries of the world through the cost of human capital [13].

Table 1 – Calculation of the value of the aggregate capital of agricultural enterprises in 2016

Region	Cost of land, million UAH	Total assets, million UAH	incl.		Human capital, million UAH	Total capital, million UAH	Gross agricultural output million UAH	Gross Goods for 1000 UAH of total capital, UAH	Products are implemented **, million UAH	Products are sold for 1000 UAH of total capital, UAH
			Non-current assets	Current assets						
Vinnitsa	36 040	48 933	11 963	36 970	2 226	87 199	13 795	158	19 590	225
Volyn	7 323	8 209	2 946	5 262	582	16 114	2 572	160	5 086	316
Dnipropetrovsk	42 310	41 953	12 341	29 613	1 374	85 637	9 146	107	15 519	181
Donetsk	23 056	13 866	4 064	9 803	753	37 676	4 374	116	8 119	216
Zhytomyr	11 871	29 016	4 570	24 446	1 162	42 050	4 310	102	6 982	166
Zakarpattia	892	1 892	757	1 136	307	3 091	355	115	490	158
Zaporozhye	40 291	22 371	7 838	14 533	893	63 555	5 451	86	12 174	192
Ivano-Frankivsk	5 194	60 999	5 683	55 316	672	66 865	1 807	27	3 830	57
Kiev	35 122	57 568	16 987	40 581	2 452	95 142	10 265	108	27 214	286
Kirovograd	39 126	37 383	11 685	25 698	1 202	77 711	7 434	96	14 962	193
Luhansk	17 134	10 939	2 500	8 440	459	28 532	2 967	104	5 832	204
Lviv	8 642	113 196	4 075	109 121	448	122 286	3 321	27	6 011	49
Mykolaiv	26 719	23 568	6 362	17 206	754	51 041	5 651	111	12 687	249
Odessa	36 900	23 592	7 733	15 859	916	61 408	6 915	113	14 803	241
Poltava	45 689	116 205	15 555	100 650	2 474	164 369	11 439	70	25 501	155
Rivne	8 555	13 785	3 362	10 423	710	23 051	2 260	98	4 328	188
Sumy	24 786	29 611	7 689	21 921	1 223	55 620	6 849	123	14 083	253
Ternopil	14 638	645	434	211	605	15 888	4 444	280	9 077	571
Kharkiv	39 849	36 838	10 602	26 236	1 329	78 015	8 865	114	18 025	231
Kherson	32 242	23 486	7 657	15 829	847	56 575	5 783	102	11 464	203
Khmelnytsky	28 804	199 788	7 229	192 560	1 160	229 753	7 540	33	13 277	58
Cherkasy	35 296	44 639	13 439	31 200	1 795	81 730	11 373	139	18 811	230
Chernivtsi	4 019	67 051	1 658	65 393	342	71 412	918	13	1 713	24
Chernihiv	25 657	46 059	8 046	38 014	1 604	73 320	7 286	99	16 256	222
<b>Ukraine</b>	<b>590 154</b>	<b>1 071 596</b>	<b>175 175</b>	<b>896 420</b>	<b>26 290</b>	<b>1 688 040</b>	<b>145 119</b>	<b>86</b>	<b>285 835</b>	<b>169</b>

Source: compiled and calculated according to the data of the State Statistics Service of Ukraine.

The above allows us to conclude that the determination of the cost of human capital and the total cost of resources, and then of national wealth, is appropriate to use to analyze the effectiveness of the economy and improve the economic mechanism. Thus, in the leading countries of North America and Western Europe, human capital in national wealth accounts for 74-76%, which indicates its significant role [14, p. 91-111].

It is obvious that the analysis of the formation and use of human capital is not exhausted by calculating its value, therefore, taking into account the economic nature of human capital and its functions in the economy, the system of indicators of its formation and use to calculate the value (price) of human capital must be supplemented. This is due to the fact that in regard to human capital in society there are numerous economic, social and institutional relationships that are characterized by a set of indicators. These indicators can be structured as follows: a subsystem that characterizes the formation of human capital, another efficiency of its use, the third interdependence between the various indicators of these subsystems. In our opinion, the lack of the proposed structural and logical schemes of indicators of the formation and use of human capital in agriculture is the inadequate consideration of the specifics of relations in them, about human capital, as well as their orientation to labor potential and the departure from many other characteristics of the reproduction of human capital. First of all, in this analysis it is necessary to allocate a subsystem of indicators characterizing the formation of human capital (Fig. 1). In the subsystem of its formation developed by us, demographic indicators, indicators of the age and sex composition of the population, health status, quality and life expectancy, quality and level of education, migration have been singled out. Their significance is determined by their ability to characterize the state and dynamics of human capital in a broad sense, to identify the investment

needs and the priority of their implementation. The analysis should begin with indicators of demographic processes.

Favorable demography in rural settlements is the starting point for the formation of the total population, its density per 1 km, favorable age and sex structure. Economic science usually does not study the issues of the impact of demographic processes on the state and reproduction of human capital, although even simple calculations of the influence of this factor on the economy show that it has a very significant role.

Undoubtedly, the reproduction of the population is accompanied by the intensification of many social and economic problems that society and enterprises do not want to do, but they form the necessary conditions for further development, improving the structure of the labor force, creating conditions for the development of personal peasant farms, the formation of families, improving the quality of life. World experience convinces that foreign business structures also often do not provide an increase in the population, since the problems of working life are solved by migration of people from other countries, because it is cheaper. However, as the experience of these countries shows, this approach is rather complicated and contradictory for the society. It should be noted that it is expedient to ensure the solution of the issues of improving the reproduction of the population, especially the rural population, by stimulating the birth rate and reducing mortality.

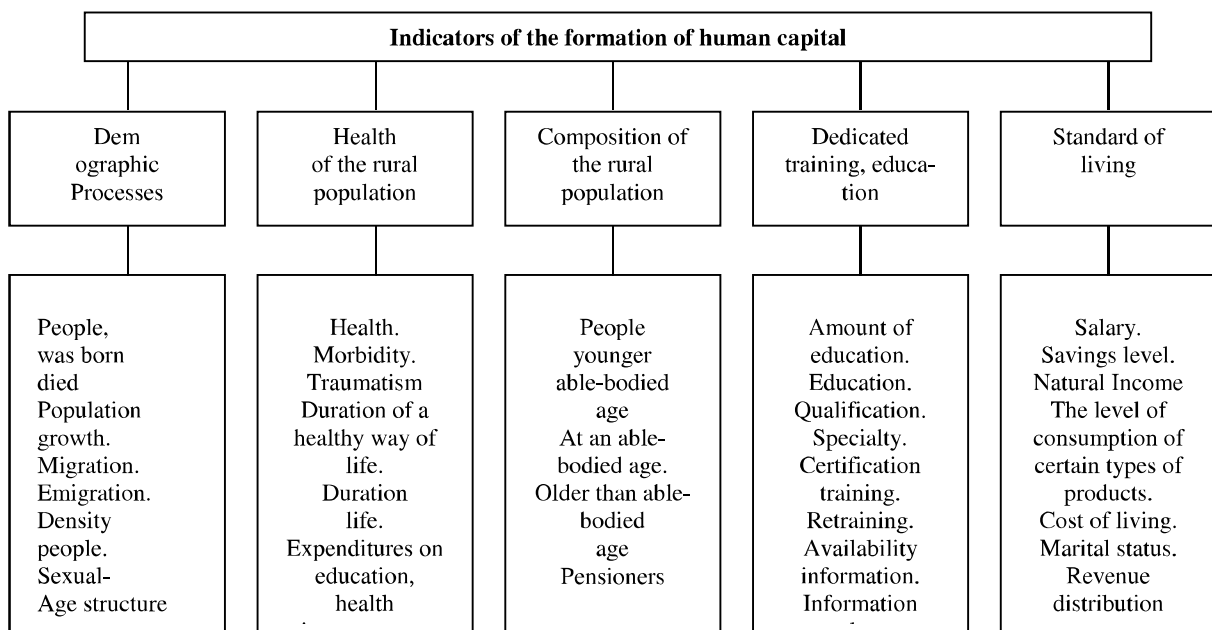


Fig. 1. The system of basic indicators of human capital formation in agriculture

Source: compiled by the author

Important indicators for the formation and the state of human capital are both indicators of human health, the level of morbidity. The high incidence of diseases, the duration of illnesses, and the shortening of life expectancy are responsible for high economic losses. We believe that for the characteristics of this factor it is advisable to use indicators of the duration of a healthy life. Economic efficiency of a long healthy life of people lies in the fact that it allows more fully use human capital, reduce losses. To characterize human capital, it is important to use morbidity indicators, characterized by its frequency and duration. With these indicators are closely related to the cost of improving the population, as well as the loss of the economy. In domestic agriculture colds, diseases through alcoholization, hard work and unsolved issues of working conditions are common. Human health forms the basis for effective and systematic work, increasing the competitiveness of the industry. This indicator is important in the modern agrarian economy, where there are processes of increasing the number of diseases, injuries, cases of premature death. The losses of society and the industrial economy from this are very large. The causes of these phenomena are multifaceted, they lie both in the national situation, the state of the economy, the social sphere and politics, and in the regional insufficient quality of life. This in-

flicts significant social and economic damage on the industry, requires serious attention to health and health issues.

In these conditions it is very important to develop the science of health economics, to strengthen its connection with the sectoral economy, the problems of working conditions and life. The outstanding French economist, Nobel laureate Maurice Alles notes that he is worried by the tendency among economists to narrow down the subject of his research, the completeness and depth of analysis of economic processes require the study of sociological, psychological, political, and political issues [15]. In our opinion, this desire fully applies to domestic economists and the state of economic science.

An important indicator of the quality of human capital is the education of the population, which can be assessed by the duration and quality of education. Now it ranges from 8 to 11 and 16 years, taking into account the higher professional formation. Note that the leading countries consider the formation of human capital a priority direction of the development of society. However, in addition to general education, it is very important to have professional training that allows performing certain jobs at an appropriate level, producing competitive products, mastering new technologies and types of robots. A competent and educated person is able to master technology faster and better, use the achievements of science. Note that the specificity of the work in agriculture is that they are physically quite heavy, not enough standardized, the working day is stretched with many interruptions, the work is often unattractive and sometimes dangerous, so most of the children who graduated from the rural school do not want to go to work in plant growing or livestock. Forming the attractiveness of the village for young people is one of the most difficult problems of the modern economy.

No less important condition for the formation of human capital, of course, is the state of quality and living standards of peasants. Low real wages, low incomes from households hamper the development of human capital, so they must be taken into account both by business and the state.

This conclusion is fully applicable to housing conditions, the development of the social infrastructure of schools, preschool institutions, canteens, shops, libraries, hospitals, residential facilities, sports complexes, and their quality. Naturally, housing should be streamlined now, it must have gas, water supply, sewerage, heat supply, electrified, radioed, have communication, rural people should have telecasts and Internet.

We believe that the proposed subsystems of human capital formation indicators will cover the main processes characterizing the reproduction of human capital. They can be used to determine the role of various factors, calculate the correlation between the quality of human capital and the quality of life, to determine the direction of development of social infrastructure, calculate the economic effectiveness of investment in human capital. The main task of scientists and practitioners is to organize monitoring of these indicators for their use in planning and analysis of the agrarian economy, and the state is to form the information base of this area of life and people's activities.

An important part of the system of quantitative characterization of human capital is the system of indicators of its use. The significance of this system lies in the fact that it allows us to comprehensively calculate the effectiveness of the use of human capital, draw relevant conclusions and proposals, and develop proposals for improving the economic mechanism for its formation and use. The study found that human capital in modern society is an object of significant investment in the formation, health, education, sports, the development of social infrastructure, improving the quality of life, labor protection, therefore it is important not only to calculate the amount of expenditure in human capital, but also to determine and improve its efficiency use. In the most complete state this system is reflected in Fig. 2.

We believe that when investigating the productivity of human capital use, researchers need to determine the effectiveness of investments in human capital, both in a narrow and broad sense, and also develop measures to increase it. At the same time, two aspects must be borne in mind: first, it is expedient to calculate the effectiveness of investments in human capital by comparing their returns in other spheres of the economy (efficiency of use); secondly, to ensure the calculation of the effectiveness of the use of human capital in time and space. The study of the effectiveness of the use of human capital assumes the calculation of the actual result for the individual capital, with the subsequent analysis of its dynamics, as well as the determination of factors, decisively affect its absolute and relative sizes for the subjects of the market, regions and countries.

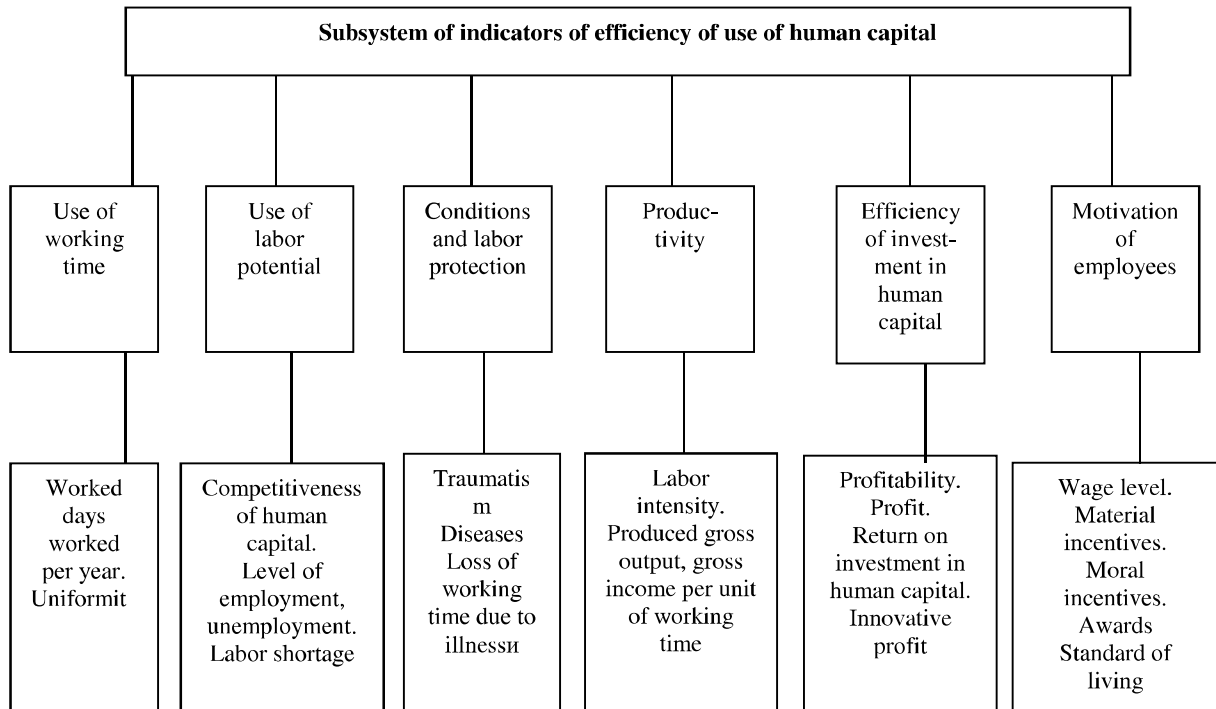


Fig.2 The system of indicators for assessing the efficiency of human capital use in agriculture

Source: compiled by the author.

The effectiveness of the formation and use of human capital at the level of an individual worker, economy, or region is the basis for analyzing its reproduction, but this does not end with research, since human capital is characterized by multiplicative efficiency. This indicator is the result of the interaction of workers, enterprises, industries and regions, as a result of the emergence of additional demand not only for their products, but also in related industries, a significant increase in investment. As the practice of leading countries shows, all investments in human capital have multiplicative efficiency. By increasing employment, quality, motivation, improved proportionality, professionalism and other qualities, aggregate income is growing. In quantitative terms, the multiplicative efficiency of investments in human capital can, in our opinion, be determined by the formula:

$$E_{\text{мул.л.к.}} = \frac{\Delta D_{\text{л.к.}}}{\Delta I_{\text{л.к.}}}, \quad (1.4)$$

where  $E_{\text{мул.л.к.}}$  – the multiplicative efficiency of investment in human capital, UAH;  
 $\Delta D_{\text{л.к.}}$  – additional national income from investments in human capital, UAH;  
 $\Delta I_{\text{л.к.}}$  – increase in the volume of investments in human capital, UAH.

World experience convinces that the multiplicative effect should be taken into account and used in the evaluation of investments, combined with the calculation and increase of the immediate effectiveness of human capital, used to more fully assess the effectiveness of its formation and use. It should be noted that the sphere of reproduction has significant scales of multiplicative efficiency, since it depends on the social position, incl. workers of agrarian economy. It is obvious that the multiplicative effect in the modern economy can be an important source of development of the social sphere and social infrastructure, and hence of the individual [16, p. 196-202].

Summing up the results of the conducted research of the system of indicators of formation and use of human capital, it is expedient to ensure their maximum correspondence to the economic nature of this category, to the features of its reproduction in the agrarian economy. We believe that this approach is most consistent with a market economy, both social and institutional, which will maximize the profits of agricultural producers and increase people's welfare. Of particular importance, in our opinion, is the calculation of the value (monetary expression) of human capital. This indicator can be widely used in determining the cost of aggregate resources of enterprises, industries, regions, in calculating the national wealth, for various intra-industry and intersectoral

comparisons of indicators of the effectiveness of their use. This approach helps to deepen the analysis of the effectiveness of the economy. We believe that it is very important to take into account their multiplicative effect in the system of indicators of efficiency of investments in human capital. This will significantly expand aspects of the effectiveness of human capital, will provide additional arguments in favor of its development, as well as create a methodological basis for improving the mechanism of its formation and use.

In the current conditions, it is advisable to evaluate the innovativeness of the human capital of agriculture and to determine the indices of the influence of human capital on the processes of organizing scientific and innovative activities in the system. Thus, the index of innovation in the human capital of agriculture records the level of influence of the capital of education and capital of cultural and moral readiness on the level of the innovative potential of the system and is characterized by the following parameters: the level of the ability of industry workers to generate new ideas; level of professional experience, knowledge, skills of employees; level of state of self-education and education of employees; the level of commitment of industry employees to the values of invention; level of focus of employees on career growth (level of motivation).

In turn, the indicator of the contribution of human capital to the change in the innovative potential of agriculture characterizes the degree of influence of capital training, the capital of health and the capital of social identity on the organization of the processes of scientific and innovative activity and is determined by the following parameters: the effectiveness of the work of the groups of programs and projects of scientific and innovation activities of rural participants economy (the level of the created added value of the group); the effectiveness of the exchange of information, experience, knowledge among industry workers; the effectiveness of the participation of agricultural workers in the introduction of various forms of innovation; the level of readiness for the adoption of effective innovative solutions for industry workers; the level of quantitative characterization of the impact of human capital on the results of scientific and innovative activities in agriculture.

Obviously, there is a need to justify the methodology for assessing and determining indicators that characterize human capital as an important element of the innovative potential of agriculture. We believe that the evaluation of human capital in the aspect of innovative development of agriculture should be viewed as a set of interconnected processes for finding cause and effect processes, as well as links and correlations between different sets of information data obtained from the use of human capital in the scientific and innovative activities of agriculture using statistical methods.

An important place is given to the analysis of the accumulated experience and knowledge of workers in the industry, the scientific and innovative activities of workers are involved, and not the assessment of the balance and resource intensity of the developed and implemented strategies and programs for the formation and development of human capital.

The generalization of the scientific literature made it possible to identify the basic methods of assessing human capital that would allow for its impact on the innovative development of the study area, in particular: the method of calculating the index of human capital (the Watson-Whiteatt method) method of assessing the model of organizational effectiveness of scientific and innovation activities in the industry; method of monitoring human capital (the method of E. Mayo); Method for assessing the satisfaction of all participants in scientific and innovative activities (method of constructing the model of evaluation of the SearsRoebuck); method of constructing a system of balanced indicators (Kaplan and Norton method); method for constructing a quality model (European Quality Management Fund (EFQM) human capital assessment method [17, pp. 121-137; 18; 19]. The above methods of assessing human capital in the aspect of innovative development of agriculture require the expansion of statistical reporting and indicators, which would include indicators of satisfaction of industry workers, buyers of products and services, an assessment of the impact of agriculture on economic growth and sustainable development of rural areas.

When carrying out research on the processes of formation and use of human capital, an important place is given to forecasting, because on the basis of an informed forecast it is possible to determine the potential possibilities of its use, to clarify priorities and programs for the development of agriculture. At the same time, scientific forecasts that use quantitative estimates based on a detailed analysis of all available information, as well as a correct vision of the main trends and laws of development, are valuable.



In the case of problems of forecasting economic dynamics, I use work that reflects the influence of production factors on the output indicators of the economic system. It is advisable to consider the factors of the formation of the human capital of agriculture in the yakon of the individual factors, and in terms of the output index – the value of agricultural products in all categories of farms. Thus, it is expedient to include the following economic entities in the forecast model of the formation and use of the human capital of agriculture: agricultural enterprises; farms; personal peasant farms.

The information base for the development of the forecast is the database of the country's development statistics and the field of agriculture (number, natural population movement, world level, provision of social infrastructure facilities, etc.) and data of specially organized statistical observations (censuses, special selective-demographic surveys).

**Conclusions.** It is established that the peculiarity of the formation and use of human capital in agriculture is that it is formed in various socio-economic and institutional relations. These processes are more complicated, since not only hired workers but also land owners who are oriented toward gaining a share in profits, farmers, entrepreneurs, lead-agribusiness, managers-owners of capital, hired managers, shareholders, intermediaries are found in agricultural production. Obviously, the vicarities of social and economic groups engaged in agricultural production have objective economic interests, contradictions and require the use of appropriate mechanisms for their solution.

The generalization of the existing methodological approaches to the evaluation of the reproduction and use of human capital in agriculture made it possible to conclude that there is little consideration in them of the specifics of the relations that exist with regard to human capital, as well as their orientation toward assessing the labor potential and not taking into account many components, which affect the processes of its reproduction. The proposed system of indicators for the formation and use of human capital exploring the factors that determine the characteristics of these processes allows them to more objectively assess them and determine their impact on the value of individual indicators. The questions of substantiation of methodical approaches to determine the value of human capital in agriculture, taking into account foreign and domestic developments, as well as the possibilities of the domestic statistical base of agriculture, remain unresolved.

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## **Формирование системы индикаторов к оценке воссоздания и использования человеческого капитала в сельском хозяйстве**

**Гринчук Ю., Утеченко Д.М.**

Обобщены методические подходы зарубежных и отечественных ученых к оценке воспроизводства и использования человеческого капитала в сельском хозяйстве и обобщены их положительные стороны и недостатки. Предложено оценку формирования и использования человеческого капитала проводить на основе определения доходности человеческого капитала, в частности, расчета полученного дохода на человеческий капитал, который позволяет определить его стоимость. Доказана необходимость проведения анализа формирования и использования человеческого капитала на основе комплексной системы показателей с учетом влияния многочисленных экономических, социальных и институциональных отношений. Обоснована система показателей по следующим группам: первая харак-

теризует формирование человеческого капитала, втора – эффективность его использования, третья – взаимозависимость между различными показателями этих групп.

Систематизированы факторы, которые влияют на значение показателей воспроизводства и использования человеческого капитала, а также определены возможности их расчета, исходя из существующей информационно-аналитической базы сельского хозяйства. Доказано, что подсистема показателей формирования человеческого капитала позволяет охарактеризовать процесс воспроизводства человеческого капитала на основе расчета корреляции между качеством человеческого капитала и качеством жизни. Отмечено, что аналитические расчеты по этой подсистеме должны стать базой для определения направлений развития социальной инфраструктуры, расчета экономической эффективности инвестиций в человеческий капитал и обоснование направлений формирования предпринимательских способностей и лидерства у сельского населения.

Доказано, что исследования производительности использования человеческого капитала целесообразно проводить путем расчета эффективности инвестиций в человеческий капитал и сравнения полученных значений с их отдачей в других сферах экономики, а также на основе расчета эффективности использования человеческого капитала во времени и пространстве. Очевидно, расчет показателей эффективности использования человеческого капитала осуществляется на учете полученного фактического результата на единицу человеческого капитала, с последующим детальным анализом его динамики, факторов, влияющих на его абсолютные и относительные величины.

Автором доказано, что нынешние условия требуют проводить оценку инновационности человеческого капитала сельского хозяйства с обязательной идентификацией основных факторов и форм их влияния на процессы организации научной и инновационной деятельности в системе. Доказано, что показатель вклада человеческого капитала в смену инновационного потенциала сельского хозяйства характеризуется степенью влияния капитала подготовки, капитала здоровья и капитала социальной идентичности на организацию процессов научной и инновационной деятельности и определяется уровнем созданной добавленной стоимости группы за счет: эффективности обмена информацией опыта, знаниями между работниками отрасли; эффективностью участия работников сельского хозяйства во внедрении различных форм инноваций; уровнем готовности к принятию эффективных инновационных решений работников отрасли; уровнем количественной характеристики воздействия человеческого капитала на результаты научной и инновационной деятельности в сельском хозяйстве.

**Ключевые слова:** человеческий капитал, воспроизводства человеческого капитала, эффективность использования человеческого капитала, инновационность человеческого капитала.

#### **Formation of the indicator system to assessment of reconstruction and use of human capital in agriculture Hrynychuk Y., Utechenko D.**

The article summarizes the methodological approaches of foreign and domestic scientists to the evaluation of the reproduction and use of human capital in agriculture and summarizes their positive and shortcomings. An estimation of the formation and use of human capital is proposed based on the determination of the profitability of human capital, in particular, the calculation of the income received for human capital, which allows to determine its value. The need to analyze the formation and use of human capital on the basis of an integrated system of indicators, taking into account the influence of numerous economic, social, institutional relations is proved. The system of indicators on the following groups is grounded: the first characterizes the formation of human capital, the second efficiency of its use, the third interdependence between the various indicators of these groups.

The factors influencing the value of indicators of reproduction and use of human capital are systematized, and the possibilities of their calculation are determined on the basis of the existing information and analytical base of agriculture. It is proved that the subsystem of human capital formation indicators allows characterizing the process of reproduction of human capital on the basis of calculating the correlation between the quality of human capital and the quality of life. It is noted that analytical calculations on this subsystem should become a basis for determining the directions of social infrastructure development, calculating the economic efficiency of investments in human capital and justifying the development of entrepreneurial abilities and leadership among the rural population.

It has been proved that it is expedient to study the productivity of the use of human capital by calculating the effectiveness of investments in human capital and comparing the obtained values with their returns in other spheres of the economy, and also on the basis of calculating the efficiency of using human capital in time and space. Obviously, the calculation of the indicators of the effectiveness of the use of human capital is carried out on the basis of the received actual result per unit of human capital, followed by a detailed analysis of its dynamics, factors affecting its absolute and relative values.

The author proves that the current conditions of the vimagayut are assessed the innovativeness of the human capital of agriculture with the obligatory identification of the main factors and the forms of their influence of human capital on the processes of organizing scientific and innovation activities in the system. It is proved that the index of the contribution of human capital to the change in the innovative potential of agriculture is characterized by the degree of influence of capital training, health capital and social identity capital on the organization of the processes of scientific and innovative activity and is determined by the level of the created added value of the group through: the effectiveness of information exchange of experience, branch; the effectiveness of participation of agricultural workers in the introduction of various forms of innovation; the level of readiness for the adoption of effective innovative solutions of industry workers; the level of quantitative characteristics of the impact of human capital on the results of scientific and innovative activities in agriculture.

**Key words:** human capital, reproduction of human capital, efficiency of human capital use, innovation of human capital.

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*Білоцерківський національний аграрний університет***МЕТОДИЧНІ ПІДХОДИ ДО ОЦІНЮВАННЯ  
МАРКЕТИНГОВОЇ ДІЯЛЬНОСТІ АГРАРНИХ ПІДПРИЄМСТВ**

У статті подано особливості виробничої діяльності, що впливають на комплекс маркетингу та його результативність. Виділено, що у зарубіжній практиці використовується система фінансових та нефінансових показників оцінювання результативності маркетингової діяльності. Авторами систематизовано групу маркетингових показників, яка включає фінансові показники; ринкові параметри; показники реакції клієнтів; індикатори оцінки роботи із постачальниками та посередниками; характеристику інноваційної діяльності.

Доведено, що оцінювання результативності маркетингової діяльності дозволяє аграрному підприємству визначити поточну ринкову позицію та обґрунтувати раціональні заходи щодо її посилення. Використання збалансованої системи показників оцінки маркетингу дозволяє проводити порівняльний аналіз з конкурентами на ринку. Виявлено труднощі у встановленні зв'язків результату маркетингу із фінансовими показниками та показниками оцінки результативності діяльності підприємства в цілому, а також відсутність у вітчизняній практиці використання маркетингових показників, що потребує проведення відповідних досліджень для створення банку первинних даних.

Обґрунтовано, що основним критерієм ефективності маркетингової діяльності аграрного підприємства є повне задоволення потреб споживачів у високоякісній і безпечній сільськогосподарській продукції та продовольстві за наявних виробничих можливостей, сприяння у вирішенні соціальних та екологічних проблем, а також формування партнерських взаємовідносин із партнерами по бізнесу. Важливою складовою оцінювання маркетингової діяльності аграрних підприємств є аналіз маркетингових затрат, який доцільно здійснювати в три етапи з метою встановлення їх впливу на формування сукупних доходів.

Встановлено, що побудова системи показників маркетингової діяльності має ґрунтуватися на таких принципах: використання узагальнюючих показників; універсальності у використанні; єдності між узагальнюючими та частковими показниками; поєднання кількісних і якісних оцінок. Запропоновано здійснювати аналіз результатів маркетингової діяльності аграрних підприємств за такими напрямками: аналіз річних планів збуту, аналіз прибутковості, ефективності маркетингу, товарно-матеріальних запасів. Оскільки діяльність аграрних підприємств здійснюється на агропродовольчому ринку, то для аналізу і прогнозування його кон'юнктури доцільно використовувати показники, що характеризують внутрішній товарообіг, показники зовнішньої торгівлі, цінні показники.

**Ключові слова:** аграрний маркетинг, показники маркетингової діяльності, затрати маркетингу, ефективність маркетингу.

**Постановка проблеми.** У конкурентному середовищі ускладнено функціонування аграрних підприємств, що потребує здійснення систематичної оцінки результативності маркетингової діяльності на основі об'єктивних показників. Саме тому актуальними є дослідження щодо розробки збалансованої системи показників маркетингової діяльності підприємства із урахуванням динаміки змін маркетингового середовища, а також внутрішнього потенціалу підприємства. Серед основних чинників, що доводять важливість оцінювання у підвищенні результативності маркетингової діяльності підприємства слід виділити: глобальні зміни в навколишньому середовищі, нові запити споживачів у якісному та безпечному агропродовольстві, поява інноваційних технологій, швидкий розвиток інформаційних ресурсів і т.д. Окрім цього, нині методи підвищення та оцінювання результативності маркетингової діяльності представлено переважно у теоретичних розробках, відсутнє їх практичне обґрунтування. У свою чергу, гнучка адаптація аграрних підприємств до динамічних змін ринкового середовища та дотримання принципів сталого розвитку на основі підвищення результативності маркетингової діяльності є основним завданням для вітчизняного агробізнесу. Очевидно, що забезпечення економічної стійкості підприємств досліджуваної галузі залежить від маркетингової діяльності, тому розробка методичних підходів її оцінювання на основі системи збалансованих показників із урахуванням особливостей галузі, стратегічної бізнес-орієнтації підприємства дозволить суб'єктам господарювання реалізовувати оперативні та стратегічні маркетингові цілі й завдання щодо сталого розвитку на основі точкової реалізації маркетингових функцій.

**Аналіз останніх досліджень та публікацій.** Різнобічні аспекти щодо формування системи індикаторів оцінювання маркетингової діяльності бізнес-структур на цільових сегментах ринку знайшли відображення у працях багатьох зарубіжних та вітчизняних учених-економістів. Серед провідних науковців зарубіжних країн слід назвати Г. Армстронга, Г. Асселя, П. Друкера,