

EFFICIENCY OF OPERATION OF AGRARIAN HUMAN CAPITAL

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Received 3 March 2022

Accepted for publication 31 May 2022

ABSTRACT

The article substantiates the identification of a specific form of human capital – agrarian and gives its author's interpretation. In determining its quantitative value, the advantages of using the income assessment method in comparison with the cost (investment) approach are proven. The latter circumstance is the basis for the development of methods to assess the effectiveness of its functioning in the agrarian sphere, based on the acme technology. The use of the acmeological approach is conditioned by the necessity of a complex analysis of the process of human capital formation in the agricultural sector of Belarus. This approach considers an individual's creative and purposeful possibilities and achievements. A system of interrelated indicators, which allows to determine the effectiveness of the use of agrarian human capital, is proposed. The main aim of the research is to develop a methodical approach to evaluate the efficiency of the functioning of agrarian human capital. The article was prepared with the use of general scientific research methods and private approaches to solving problems. In particular, the methodology of analysis, synthesis, graphic and tabular methods were used. Practical testing of the proposed assessment methodology indicates a decrease in the efficiency of functioning of agrarian human capital. This is due to the prevailing dynamics of growth of quantitative indicators compared to qualitative parameters. The proposed methodological approach to assessing the effectiveness of the functioning of agrarian human capital can be used by the representatives of management bodies, researchers, to develop program documents to form state agrarian and regional policy.

Keywords: *agrarian human capital, cost, efficiency, functioning, acmeological approach, productivity.*

Articolul fundamentează identificarea unei forme specifice a capitalului uman, și anume a capitalului uman agrar și prezintă viziunea autorului asupra acestuia. La determinarea valorii sale cantitative au fost relevate avantajele utilizării metodei de evaluare a veniturilor în comparație cu metoda de evaluare a costurilor (investițională). Aceasta din urmă se află la baza metodologiei de evaluare a eficienței funcționării sale în sectorul agrar, bazată pe tehnologia acme. Utilizarea abordării acmeologice a fost determinată de necesitatea analizei complexe a procesului de formare a capitalului uman în sectorul agrar din Belarus. Această abordare ia în considerare abilitățile edificatoare și creativele individului, capacitatea acestuia de a-și atinge scopurile propuse. Se propune un sistem de indicatori interrelaționați, care permite determinarea eficacității utilizării capitalului uman agrar. Scopul principal al cercetării constă în dezvoltarea unei abordări metodologice pentru evaluarea eficienței funcționării capitalului uman agrar. În procesul de elaborare a articolului au fost utilizate metode științifice generale de cercetare, abordări particulare de rezolvare a sarcinilor. În special, au fost aplicate metode de analiză, sinteză, metode grafice, tabulare. Testarea practică a metodologiei de evaluare propusă denotă o scădere a eficienței funcționării capitalului uman agrar. Acest lucru este condiționat de dinamica de creștere predominantă a indicatorilor cantitativi în comparație cu parametrii calitativi. Abordarea metodologică propusă pentru evaluarea eficienței funcționării capitalului uman agrar poate fi utilizată de reprezentanții organelor guvernamentale, de cercetători, pentru elaborarea documentelor de politici, care vizează formarea politicii agrare și regionale de stat.

Cuvinte cheie: *capital uman agrar, cost, eficiență, funcționare, abordare acmeologică, productivitate.*

Аннотация. В статье обосновано выделение специфической формы человеческого капитала – аграрного и дано его авторское трактование. При определении его количественной величины доказаны преимущества использования доходного способа оценки в сравнении с затратным (инвестиционным) подходом. Последнее обстоятельство заложено в основу разработки методики оценки эффективности его функционирования в аграрной сфере, базирующейся на акметехнологии. Использование акмеологического подхода обусловлено

необходимостью комплексного анализа процесса образования человеческого капитала в аграрном секторе Беларуси. Этот подход учитывает созидательные, творческие возможности и целедостижения индивида. Предложена система взаимосвязанных показателей, которая позволяет определить результативность использования аграрного человеческого капитала. Основной целью проведенных исследований является разработка методического подхода оценки эффективности функционирования аграрного человеческого капитала. Статья подготовлена с использованием общенаучных методов исследования, частных подходов решения поставленных задач. В частности, нашли применение методология анализа, синтеза, графического, табличного способов. Практическая апробация предложенной методики оценки свидетельствует о снижении эффективности функционирования аграрного человеческого капитала. Это обусловлено преобладающей динамикой роста количественных индикаторов в сравнении с качественными параметрами. Предложенный методический подход оценки эффективности функционирования аграрного человеческого капитала может быть использован представителями органов управления, исследователями для разработки программных документов, нацеленных на формирование государственной аграрной и региональной политики.

Ключевые слова: аграрный человеческий капитал, стоимость, эффективность, функционирование, акмеологический подход, продуктивность.

JEL Classification: B41, C13, C18, E22, E24

UDC: 631.158:331.101.262

INTRODUCTION

The formation of a knowledge-intensive economy is conditioned by the necessity of increasing the human capital in the composition of the national wealth. In modern conditions, this resource is characterized by its inexhaustibility and renewability and predetermines the prospects and directions of development not only of the Republic of Belarus, but also of the countries of Eastern Europe. One of the engines of sustainable development of these states is the agricultural sector, which provides a high level of food security and sustained growth in exports. The preservation of the existing socio-economic trends and the creation of conditions for progressive growth are conditioned by the state and effectiveness of the use of human capital in the agro-industrial complex of these countries. The limited resource provision of the agrarian sector, specifics of its functioning, insufficient investment resources actualize the task of searching new ways of innovative transformations of the countries of Eastern Europe. In this connection, the improvement of methodological foundations for assessing the functioning efficiency of agrarian human capital is an objective prerequisite for finding reserves and determining the directions of sustainable socio-economic development of the countries of the Eastern Commonwealth.

ANALYSIS OF RECENT STUDIES AND PUBLICATIONS

Theoretical and methodological issues of human capital development management in the agrarian sphere were addressed by the leading researchers in Belarus and abroad ([Гусаков, 2020](#); [Бельский, Тригубович, 2017](#); [Крестиневич, 2017](#); [Богатырева, 2018](#); [Латов, 2021](#); [Tsaurkubule, 2016](#); [Schultz, 1960](#); [Becker, 1962](#)). The variety of methodological approaches to determining the quantitative value of human capital generates a variety of methods for assessing the effectiveness of its functioning ([Гусаков, 2021](#); [Габидулин, Киршин, Лукин, 2020](#)). The lack of a single methodological solution provokes a multivariate interpretation of the obtained results. The problem is complicated by the lack of practical methodological developments in determining the performance of human capital, taking into account industry specifics ([Воронин, Чупина, Воронина, 2018](#)). Despite the wide coverage of the

issues of functioning and development of human capital in the open press, the problems of capitalization of the agrarian human potential require further scientific research.

SOURCES OF DATA AND METHODS USED

The research methodology is based on the monographic study and interpretation of previously obtained results, reflecting trends, prospects and specifics of human capital development in the agrarian sector. The subject area of research predetermined the choice of methods and tools based on the inductivity of research approaches, quantitative analysis and qualitative synthesis of input information. In order to increase the reliability of the obtained results, in the process of research we used such methods as review, continuity of observation, analysis of the stability of input data, monitoring of the close interaction of statistical indicators, and the selection of contradictory data. The methodology of collecting the input materials for the study is based on the use of official documents, collections, bulletins of the National Statistical Committee of the Republic of Belarus.

RESEARCH FINDINGS AND DISCUSSION

The priorities of the global economy indicate the limited impact of resource advantages. It determines the dominant role of innovation and technological factors, which include the level of accumulated human capital. Given the low resource intensity of the domestic economy, the analysis of methodological approaches to assessing the functioning and development of human capital seems particularly relevant.

One of the advantages of human capital is its inexhaustibility, which is due to the quantity and quality of its representatives. Human society, in its narrowest sense, is an integrated set of people. The level of its development is conditioned by the abilities of individuals. The interaction of the latter factors ensures the accumulation of individual potential and its collective increment. This circumstance characterizes the multiplicity of human capital as the ability of its expanded generation. The unique ability of self-reproduction distinguishes this form of capital from other forms of capital. The available material and technical opportunities, socio-economic conditions and institutional environment contribute to the intensity of accumulation and increment of human capital. Its source is concentrated in the human being himself. This generates the circular reproduction of human capital on a simple or extended basis. The study, adaptation and development of methodological approaches to measure the effectiveness of human capital functioning in the agrarian sector are conditioned by the objective necessity of branch development, as well as by the specific features of the research object.

Industrial and institutional transformations penetrating into all spheres of society also affect the agricultural sector, which contributes to the emergence of a new form of human capital – the agrarian. Its distinctive feature is the spatial and sectoral projection of the formation of initial human potential transformed, taking into account demographic characteristics of the local population, educational level of employees, state of the social infrastructure of rural areas, parameters of the production potential of agricultural sector organizations, investment security and innovation saturation of the agro-industrial complex, into agrarian human capital. Specialization and integration of agro-industrial production, which is a consequence of technological changes, act as a reason for increasing the knowledge-intensive capitalization of assets accumulated in human resources. Intellectual reproduction of the latter contributes to the formation of the surplus product, the value of which is more filled with knowledge (intellectual product) than with physical labor (material capital).

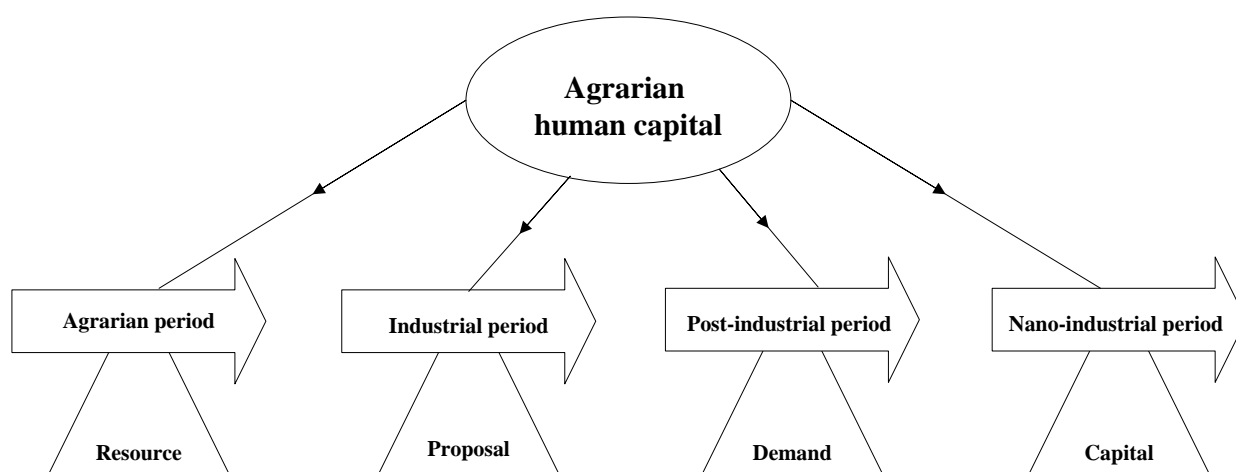
The concept of agrarian human capital goes beyond the territorial-quantitative assessment of population and is projected into the plane of agro-industrial production. In the context of the above, agrarian human capital is understood as a quantitative and qualitative measure of the creation of

surplus value of agrarian production, formed under the influence of a certain socio-economic formation, characterized by a constant movement and increment, providing the creation of an innovative product in material and non-material embodiment (Гануш, Тетеринец, 2022).

Peculiarities of the formation and development of agrarian human capital actualize the task of improving methods of management of this process. Socio-economic, technical-technological and institutional transformations in the agricultural sector contribute to the emergence of scientific schools, which determine the theoretical directions and methodological approaches of management. Aggregation of the conducted studies and their refraction in the plane of agroindustrial production allow us to identify the main stages of transformation of conceptual aspects of human capital management depending on the stages of socio-economic and technical-technological development of the agrarian sector (figure 1).

Figure 1:

Transformation of the nature of agrarian human capital at different stages of industrial development.



Source: compiled based on (Зикунова, 2016).

Conceptual approaches to the management of human capital development form theoretical postulates and modifications of the categorical apparatus. Further, there is a transformation of methodological approaches to assess the effectiveness of its functioning. In the theory and practice of economic analysis there is a sufficient number of methodologies that contribute to such research. Sector specifics of the object of the research, peculiarity of conditions of formation and development, and non-triviality of capitalization mechanisms predetermine the need to develop new approaches to measure the effectiveness of agrarian human capital functioning, which will comprehensively take into account the relationship of the above-mentioned factors.

The objective condition for solving this problem is to determine the quantitative value of agrarian human capital from the position of its functional refraction. The latter circumstance is the resulting factor of the transformation of human potential into capital and is determined by the amount of income received from its use. In this context, the use of the expenditure method is inexpedient, which is caused by a rather tentative ability of the current investment costs to reflect the possibilities of capitalization of human potential. There is no denying the importance and necessity of such investments; however, it is initially somewhat premature to accept them as a positive result. In particular, as studies have shown, the level of literacy of the population weakly correlates with the

ability to capitalize on the knowledge gained ([Попов, 2020](#)). In other words, the number of schools, colleges and universities, acting as one of the main elements of investment spending and forming the basis of human potential, all other things being equal, is not an indication that the knowledge received in them will be transformed into capital.

As a result, we can conclude that the income method of cost estimation of human capital is the most effective from the position of measuring the efficiency of functioning. This method is also not without some disadvantages. Its main advantage is the possibility to determine the total value, which shows the level of capitalization of human potential. The author's understanding of human capital is to consider not only the total of accumulated knowledge, skills, qualifications, health and other factors, but also the value added, which can be transformed into financial and non-financial wealth.

Despite the high importance of the latter factor, its quantitative assessment is challenging because of the high differentiation of approaches revealing its essence. As a consequence, statistical analysis becomes virtually impossible, which is complicated by the peculiarities of the territorial and sectoral approach. In these circumstances, the most practice-oriented solution is the assessment of human capital in the agricultural sector through the prism of received incomes.

Current research in this area encounters a number of problems of statistical analysis of data due to the intersection of sectoral and territorial planes:

- *the spatial and sectoral projection of agrarian human capital is disclosed in the context of rural areas, accumulating an integrated set of human resources and the focus of agrarian activities;*
- *aggregation of sources of income of the rural population for the purpose of an integrated assessment of agrarian human capital. It is proposed to use the value of disposable resources as a generalizing initial indicator, which includes not only money, but also the value of consumed food products produced in private subsidiary plots, excluding material costs of their production, as well as the value of benefits and payments received in kind, which is most typical of rural areas ([Тетеринец, 2021](#)).*

The proposed approach to the assessment of agrarian human capital has a theoretical and methodological research base and is based on official statistical data. It should be noted that the number of rural residents is identical to the number of household members, making the agrarian human capital assessment comparable (table 1).

Table 1.

Indicators of agrarian human capital

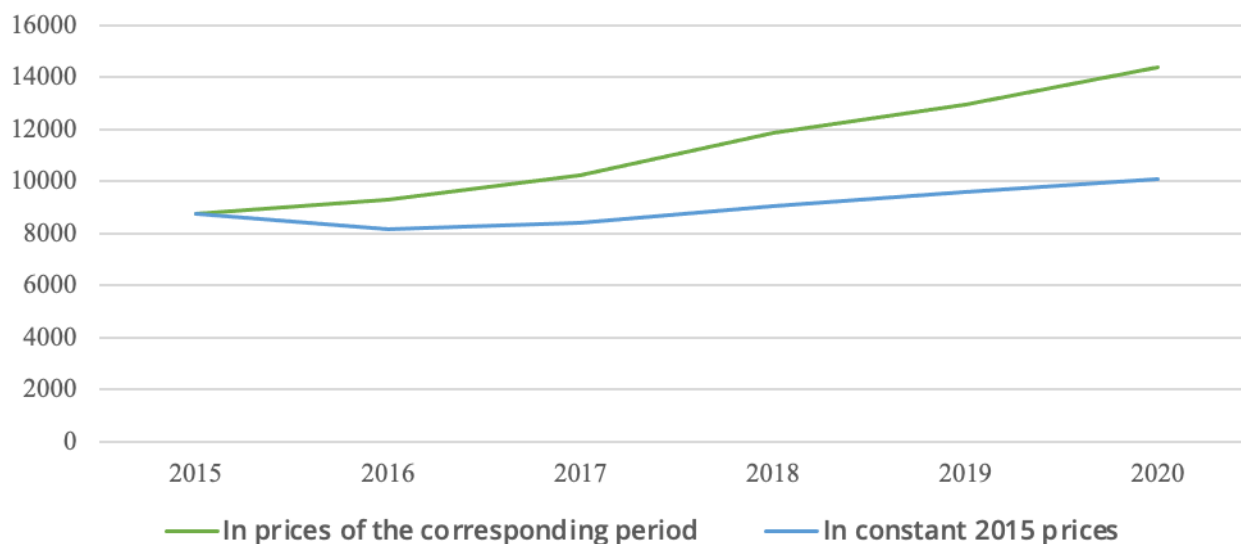
Indicators	Period					
	2015	2016	2017	2018	2019	2020
Disposable resources of households in rural areas, rubles per month	724,7	773	855,1	995,8	1089,5	1207,7
Number of households in rural areas	1009184	1004002	998847	993718	992742	992742
Calculated value of agrarian human capital in current prices, million rubles	8776,3	9313,1	10249,4	11874,5	12979,1	14387,2
Calculated value of the agrarian human capital in constant prices of 2015, million rubles	8776,3	8170,7	8398,9	9065,9	9618,8	10075,2

Note: compiled by the author ([Тетеринец, 2021](#); [Социальное положение, 2021](#); [Число и состав домашних хозяйств, 2020](#)).

The calculated value of human capital in the agricultural sector of the Belarusian economy is 14387.2 million rubles and increased almost 1.6 times during the period under study. The trend of its change is due to two interrelated but multidirectional vectors: a significant increase in the disposable resources of households in rural settlements with a simultaneous decline in the rural population (figure 2).

Figure 2.

Dynamics of the estimated value of human capital in the agricultural sector, million rubles.



Source: own calculations.

The elimination of inflationary fluctuations allows us to obtain a comparable estimate of the value of the agrarian human capital. Using the index of changes in real disposable income in prices of 2015 allows us to obtain its value in constant prices. The calculations show that in the period under study, the comparable value of the agrarian human capital increased by 1.2 times, which reflects its qualitative growth. Determination of the quantitative value of human capital forms a methodological platform for measuring its functioning efficiency. The comparison of the obtained assessment with other macro- and meso-indicators allows studying the dynamics of its quantitative changes, identifying qualitative shifts, and determining perspective directions of development.

Taking the need for a qualitative assessment of the efficiency of agricultural human capital functioning as a basis, it is advisable to use the methodology of its calculation, based on the comparison of qualitative indicators. The latter allows determining the ratio of the results obtained at a certain point in time, determined by the initial value of the evaluated parameter. In the context of the above, it is proposed to use the following system of indicators, comprehensively reflecting the relationship between changes in qualitative macro-criteria and the size of agrarian human capital:

- *human capital efficiency coefficient (\overline{EHC}_t), which is calculated as the ratio of gross value added of agriculture to the value of agricultural human capital. This allows us to determine the real return on its use, which is expressed by the amount of newly created value.*
- *the coefficient of prolonged efficiency of human capital ($\overline{\Delta EHC}_{t-n}$), which is calculated as the ratio of the growth of gross value added of agriculture to the value of agricultural human capital. This indicator is an additional indicator and reflects the real contribution of human capital, taking into account the time lag. As the latter, it is proposed to use a four-year interval as a period reflecting the successive increase in human capital, taking into account the time spent on higher education.*

- productivity of human capital (\overline{PHC}_t), distinguished by the use in the denominator of the value of agrarian human capital as a qualitative parameter, reflecting the efficiency of its functioning in the context of the current socio-economic transformations.
- productivity elasticity coefficient ($I_{L/P}$), which is determined by the correlation between the growth rate of labor productivity and productivity of agrarian human capital. This aggregate index reflects the correlation of the quantitative parameter of the rural population and the qualitative indicator that contributes to the growth of human capital.
- profitability elasticity coefficient ($I_{Pr/HC}$). It characterizes the relationship between the rate of change in the profitability of the agricultural sector and the capitalization of human capital. This indicator is defined as the ratio of the growth rate of net profit of agricultural organizations and the value of the agrarian human capital.

The income level of the rural population is equivalent to the value of human capital and reflects its estimated value at a particular point in time. It is predetermined by the abilities of self-realization of an individual and the socio-economic conditions that ensure its realization. A variety of objective and subjective factors directly impact this process, contributing to the increase or decrease in the level of capitalization.

The intensity of human capital accumulation becomes possible through a proportional increase in qualitative macro-metrics. The opposite situation is evidence of the predominant influence of extensive factors. The presented methodology is based on the transformation of the income approach of determining the quantitative value of agrarian human capital into the plane of evaluation criteria, characterizing the efficiency of human capital functioning. In the context of the modern theory of human capital development management, such an approach can be called an acmeological approach, which takes into account the impact of not only quantitative indicators, but also qualitative parameters [Edvinsson]. The proposed system of acme-indicators allows us to comprehensively assess this relationship through the prism of the effectiveness of its functioning (table 2).

Table 2.

Acme-indicators for assessing the effectiveness of the functioning of the agrarian human capital

Indicators	Period					
	2015	2016	2017	2018	2019	2020
Human capital efficiency coefficient ()	0,64	0,70	0,78	0,68	0,71	0,70
The coefficient of prolonged efficiency of human capital ()	-	-	0,206	0,203	0,201	0,142
Productivity of human capital (), руб/руб	1,54	1,66	1,76	1,59	1,59	1,58
Productivity elasticity coefficient ()	-	0,99	1,03	1,10	1,08	1,11
Profitability elasticity coefficient ()	-	-46,71	2,51	0,65	1,58	0,83

Note: calculated based on ([Сельское хозяйство, 2021](#)).

The assessment of the obtained data allows us to note the increase in the effectiveness of the functioning of the agrarian human capital in the medium term, while there is an outlined dynamics of its decrease in the tactical plan. The combined analysis of the acme-indicators and shows a significant decrease in the return of agrarian human capital, taking into account its intellectual contribution. The steady decline in the coefficient of prolonged efficiency characterizes the decrease in the growth of added value in agriculture per ruble of

capitalized human capital. Therefore, we can conclude that the educational component of agrarian human capital, as well as investment expenditures for this purpose, do not provide the proper effect.

The coefficient of productivity elasticity reflects the level of intensity of development of the agrarian sector. It is demonstrated through the interaction of human and labor capitals. This index represents the percentage change in labor productivity, taking into account the change in 1 % of agrarian human capital productivity growth. Calculations show its steady growth, characterizing the direct dependence of quantitative output parameters on qualitative indicators of innovative saturation of human capital. The dynamics of changes in the productivity of human capital have a reverse vector, thereby revealing a decrease in its efficiency. The combination of the existing trends allows us to state the following: the extensive nature of its accumulation occurs faster than the return on its use.

CONCLUSIONS

The innovative vector of socio-economic development of society determines the relevance of concentration in the agricultural sphere of the intellectual component. This represents the degree of influence of human capital on the formation of the final results of agricultural organizations. This necessitates the study of the impact of the relationship of the evaluated parameters by correlating the rate of their change in the dynamics. Such indicator is the coefficient of profitability elasticity.

The calculations show that there is no direct correlation between the profitability of organizations and the amount of accumulated agrarian human capital. To a certain extent, this characterizes the inefficiency of the latter, as it contradicts the previously conducted theoretical and empirical studies. The human being in the modern world is one of the main drivers of economic growth, forming the reserve for its progressive development. Underutilization of human potential significantly limits the opportunities of the agrarian sector for sustainable reproduction and actualizes the task of priority use of this reserve.

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