

DOI: 10.52363/passa-2024.2-16

UDC: 351

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ECONOMIC AND SOCIAL MECHANISMS OF THE EFFICIENCY OF PERSONNEL TRAINING FOR THE CIVIL DEFENSE SYSTEM OF UKRAINE

The article analyzes the economic and social mechanisms of the effectiveness of personnel training for the civil defense system of Ukraine. Financial resources for personnel support were analyzed, which depend on two components: the number of personnel and the salary of each employee. If the salary is regulated by state regulations and acts annually in accordance with the capabilities of society, the difficulty of work and the qualifications of personnel, then the number of employees of the operational and rescue service is regulated by regulations that are revised quite rarely and, as experience shows, only formally, since the same figures can be found in the regulatory documents of different years. The criteria for the scientific validity of norms and cost standards are their creation of financial conditions for the effective operation of units of the State Emergency Service of Ukraine, the relationship between the amount of funding and the effectiveness of operational and rescue activities and its final results.

Keywords: *economic and social mechanisms, civil defense, personnel training.*

Problem setting. Investments in education are often equated with investments in human capital, and therefore are measured as capital gains from investment

in human capital, which according to data is about 8%. The author supports the conclusions of M. Blaug regarding the theory of human capital in terms of the lack of clear forecasts regarding the return on investment in education and qualitative assessments of future non-monetary incomes, which in turn give rise to completely different conclusions about the optimal educational strategy [3]. Based on this, it is quite difficult to determine the effectiveness of personnel training costs for the civil defense system through human capital. Other approaches to evaluating the effectiveness of personnel training are the models and methods proposed by D. Kirkpatrick, J. Phillips, Tyler, Scrivens, Stafflebeam, Byrd, as well as McGee's biparametric evaluation and comparison of costs with income [4]. But they can also be used when the economic effects of training are obvious and can be measured and evaluated (mostly short-term training and retraining courses). In the field of civil defense, it is very difficult to estimate the reduction of losses from emergency situations due to a higher level of training of rescue personnel. The reason for this lies in the stochastic nature of emergency situations and the unpredictability of natural disasters, since each emergency situation has its own characteristics and it is impossible to compare the actions of rescuers with different levels of training in the same conditions.

Thus, to determine the effectiveness of investments in the training of personnel for the civil defense system, the above approaches are not very applicable, and first of all – due to the complexity of measuring the results of education. Therefore, the development of a system of cost effectiveness indicators is a very difficult task, and the question of the effectiveness of personnel training for the civil defense system is relevant.

The purpose of this work is to investigate the methods of evaluating the economic and socio-economic efficiency of the main function of higher education, training with higher education, and the proposed methods of evaluating the effectiveness of training officers of the civil defense system.

Recent research and publication analysis. Important aspects of public management of the system of training civil protection specialists, including problems of development of public management mechanisms and their functioning in market conditions, are investigated by the following scientists [1-5]:

Article main body. It has been proven that an integral component of the system of ensuring the national security of Ukraine, including as its component

the economic security of the state, is the protection of the population, economic objects, and national property from the harmful effects of emergency situations. That is why ensuring the protection of the population and territories in the event of a threat and the occurrence of emergency situations is one of the most important tasks of the state. Indicators of the state of civil security of Ukraine were determined and their weighting factors were calculated.

The Efficiency concept has recently been used very often in modern economic literature in, for example, phrases such as Economic Efficiency, Effective Management and many others. According to this, Efficiency is the provision of achieving, as a result of actions, the maximum possible positive results at the expense of the minimum required expenditure of resources. According to H. Simon, '...to act effectively' means to use the shortest way and the cheapest means to achieve the desired goals. Among several alternatives involving the same costs, one should choose the one that maximizes the achievement of administrative goals; and vice versa, among the alternatives that equally ensure the achievement of the goals, one should choose the one that involves minimal costs [5]. Since the main task of the civil defense system is to ensure the protection of the population of Ukraine from emergency situations, the training of personnel for the civil defense system is carried out mainly with state funds. On the other hand, in the conditions of limited state resources, the question of the efficiency of the use of state funds comes to the fore.

There are three main methods of measuring the efficiency of public spending: the analysis of indices, which is based on comparing the efficiency of the organization with the indicators of previous periods and with the indicators of similar organizations (taking into account alternative options); regression analysis, based on the analysis of deviations from the mean value, and analysis of data packages, focused on determining the maximum level of performance. At the same time, the above approaches are hardly applicable to the system of personnel training for civil defense.

It should be noted that the training of personnel for the civil defense system pursues several main goals:

- 1) provision of knowledge on techniques and measures to ensure the safety of the population;
- 2) revision of knowledge and practical skills in emergency prevention;
- 3) training in emergency situations in order to minimize damages and losses.

Thus, it is possible to highlight both Economic and Socio-Economic Efficiency. Socio-Economic Efficiency refers to the achievement of a defined social result per unit of costs and expresses the degree of satisfaction of the population's demand (consumers, customers) for goods and services, in our case – satisfaction with the activities of civil protection service specialists in the performance of official duties and social life.

Thus, the Socio-Economic Efficiency of personnel training for the civil defense system can be defined as the following dependence (1):

$$: \frac{Ezzb \cap Epns \cap (Ezl - mEr) \cap Eor}{\sum n} \cup \frac{(1 - \frac{\sum B}{VVP})}{\sum n}$$

where Ese – Socio-Economic Efficiency of personnel training for the civil defense system;

Ezzb – Effectiveness of the security measures organization by the civil defense service;

Ezl – Efficiency of providing labor forces;

Epns – Effectiveness of emergency prevention measures with new graduates;

mEr – Efficiency of resource provision of the civil defense service;

$\sum n$ – total number of years of training of employees of the unit;

Eor – efficiency of the organization and management system of the unit;

$\sum B$ – losses from emergency situations;

VVP – gross domestic product.

Therefore, the Socio-Economic Effectiveness of personnel training cannot and should not refer to a specific employee of the civil defense service, but evaluates his training as the overall work of the unit, which is partly made up of graduates of higher educational institutions. It should be noted that the socio-economic effectiveness of personnel training involves an assessment of the actions of the unit in which graduates of educational institutions work, but the units in the most critical condition are evaluated, as a rule, and this assessment is transferred to the entire system of personnel training for the civil defense system.

Since the protection of the population from emergency situations is one of the main functions of the state, the training of the personnel of the service is carried

out at the expense of the state. For personnel, all costs are borne by the state. But in conditions of limited resources, the economic efficiency of using these funds becomes important. Therefore, in this context, more attention should be paid to the economic efficiency of the use of funds for the training of personnel in the civil defense system, for which approximately 5% [4] of the maintenance costs of the State Emergency Service of Ukraine is spent. The indicator of economic efficiency is a relative indicator of the effect for the budget as a result of the implementation of a state function, implementation of a program, investment project, which is defined as the ratio of the result obtained by the state to expenses from the budget, that is, expenses that caused/ensured the receipt of the result: reduction of losses from emergency situations.

In other words, economic efficiency can be defined as the ratio of the achieved result to the budget expenditures for personnel training, but in the activity of the civil defense service, the result will not be an increase in the state's GDP, but in a reduction of losses due to a more effective approach to forecasting, prevention and liquidation of emergency situations.

According to the Information on the implementation of the budget program 3201360 'Training of personnel in the field of civil defense', the main indicators of effectiveness are the cost of training one cadet per year and the percentage of graduates who are employed by profession. But, according to the general concept of efficiency, in addition to the above basic indicators, it is necessary to take into account the number and quality of training of specialists, otherwise only the cost side of efficiency will be reflected.

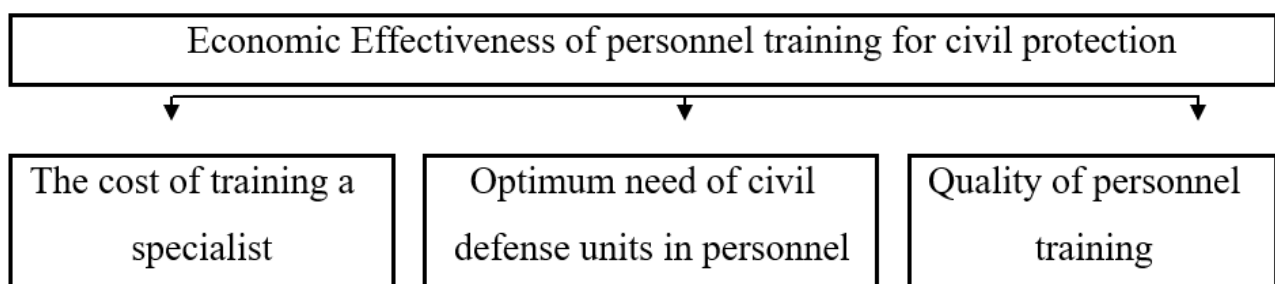


Fig. 1. Components of the Economic Efficiency of personnel training for the civil defense system

The main components of the economic efficiency of costs for the training of personnel for the civil defense system (Fig. 1) are: the cost of training a specialist; optimal

need of civil defense units in trained personnel; the quality of their training, since it is the quality of training that affects the amount of losses from emergency situations.

Based on this, the economic efficiency of training personnel for the civil defense system can be defined as the dependence of the performance of trained personnel on the costs of their training, therefore, it is the ratio of the number of cadets studying under a state order to the costs of maintaining an educational institution from the budget (2).

$$Ee' = \frac{N'}{B'} \quad (2)$$

where N' – number of cadets studying in the current year on all courses (average annual contingent);

B' – actual costs for personnel training for the year.

For governing bodies, it is the product of the ratio of the number of graduates to the costs of personnel training and the quality factor.

$$Ee = \frac{Y(N + N_{opt} - |N - N_{opt}|)}{2B} \cdot n \quad (3)$$

where N_{opt} – the need for graduates to maintain the optimal structure of the civil defense service;

n – number of years of personnel training;

N – the number of graduates of the current year;

Y – coefficient of quality of personnel training (education);

B – expenses for the maintenance of an educational institution per year, on average, only for the period of study.

Due to the fact that the actual graduation of officers may differ from the state order, this formula assumes the number of graduates that is required to maintain the optimal number of the service and was established in the state order. That is, if the number of graduates is less than in the state order, the actual graduation is taken into account. Otherwise, only the level of the state order is taken into account, since exceeding the graduation of officers brings the number of personnel of the civil protection service from the optimal level, or 'excess' graduates will not be employed. Both the first and the second lead to a decrease in the economic efficiency of training personnel for the civil defense service.

The cost of training a specialist (Bachelor, Specialist, Master) of the civil defense service with a higher education. The amount of expenses per cadet is an important indicator that indicates the costs incurred by the state to provide training for one specialist for a certain period of time. When determining the actual costs or the real cost of training one specialist, two indicators can be used: the cost of training (the product of the average cost of training a cadet per year by the number of years of training) and the real cost of training one graduate (the ratio of expenses for the maintenance of an educational institution during the training period to the number of graduates during this period). It should be noted that the indicator of the real cost of training one graduate – a specialist is most suitable for determining the economic efficiency of personnel training [3], since it reflects not only the actual costs of society for the training of specialists, but also to a certain extent the efficiency of the personnel training system itself – the system of organizing the selection of applicants. Such an important indicator as the cadet's dropout from an educational institution, which affects the general costs of training specialists, largely depends on these factors. It should be noted that each educational institution prepares specialists of different specialties, forms of education, and qualifications, and the costs of training one specialist in each of these groups of cadets, students with common specialties, forms of education, and qualifications are different. Since the largest part of the costs is the salary of the teaching staff and it can be calculated on the basis of standards, then in order to evaluate the effectiveness of each such group of students, the total costs can be distributed in proportion to the salary of the teaching staff.

Optimal need of civil defense units in personnel with higher education. The author supports the opinion of the American economist J. Galbraith regarding the training of qualified specialists – engineers ‘... their needs must be carefully calculated and planned’ [1]. In our case, emergency response training planning is about anticipating the various emergency risks that may arise and being able to deal with them quickly.

Quantitative parameters by themselves are certainly important, but not sufficient to characterize the overall effectiveness of training activities for the civil defense system, therefore, quantitative parameters must necessarily be supplemented with qualitative characteristics.

Quality of personnel training. Taking into account the quality of educational services and expressing it in formalized indicators is the most difficult problem. In

order to be able to differentiate the obtained results, clear quality standards are necessary. Undoubtedly, the most important indicator of the effectiveness of the educational process can be considered success. But success will be a real indicator of quality only in the case when the assessments will really correspond to the knowledge of the cadets, made by experts independent of higher educational institutions, representatives of the consumer of labor resources, which are the regional offices of the civil protection service.

Indicators such as the number of cadets (average annual figures or in terms of average daily attendance), the number of cadets per teacher and the number of textbooks per cadet can be expressed in real costs for each of these items. Such calculations will make it possible to determine trends over time, conduct international comparisons, and effectively monitor personnel training for the civil defense system.

Quite often, the concept of efficiency is confused with the concept of Quality of personnel training [2]. Indeed, the Quality Indicator is included in the Effectiveness of personnel training, but the Effectiveness should reflect the ratio of results to costs. Based on formula (3), the Quality of personnel training can be a measure of Efficiency assessment only in the case when all other parameters (number of graduates, costs, etc.) remain unchanged.

Based on the final result – the reduction of losses during the liquidation of emergency situations, the Economic Efficiency can be roughly estimated with an unchanged number of personnel of the civil protection service and can be estimated by profit (4):

$$DE_e = E_e \cdot (Z_0 - Z_1),$$

where E_e – Economic Efficiency of personnel training;

Z_0 and Z_1 – the level of losses from emergency situations in the previous year and the year following the issue;

DE_e – the Economic Efficiency of the production of new cadres of officers for the state.

or

$$DE_e = E_e \cdot (VM_1 - VM_0),$$

where VM_1 and VM_0 – the amount of the saved property for the year in the year

following the release and in the previous year.

Conclusions. Thus, the methods of evaluating the Economic and Socio-Economic Effectiveness of personnel training in the civil defense system were investigated. Proposed formulas for calculating the Economic and Socio-Economic Effectiveness of personnel training. The economic efficiency assessment formula includes the ratio of training results to costs and contains the following components: the number of graduates; the number of graduates for the optimal level of composition of civil protection service units; quality of preparation; state expenditures on personnel training for the civil defense system. Based on the methods of assessing the Economic Efficiency of higher education and the specifics of the civil defense service, a method of assessing the general level of Economic Efficiency of training personnel with higher education for the civil protection service is proposed.

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