COMPREHENSIVE ASSESSMENT OF THE EFFECTS OF INVESTMENTS IN ENVIRONMENTAL PROJECTS

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**Summary.** The article analyzes the effects of implementing environmental projects, outlines the most critical features of environmentally oriented investment projects, and reflects the impact of different periods in the calculations due to applying the discount factor for the economic component and the growth factor for the environmental part.

**Key words.** Environmental projects, economic, environmental, social effect, effectiveness.

One of the characteristic features of modernity is the awareness of the impossibility of optimal, proportional, and balanced development of society without taking into account the ecological component in social and economic development, and it was the international paradigm of sustainable development that determined the directions for further search for ways to improve the efficiency of nature use. That is, the sustainable socio-economic development of society involves the functioning of the economic complex, which simultaneously fulfills the conditions for maximum satisfaction of the material and spiritual needs of the population with rational, ecologically safe, balanced management.

Therefore, the issues of interaction of sustainable development and investing in environmental activities of society are critical. Investing in environmental projects is one of the manifestations of this activity; however, we should say that these issues need to be adequately reflected in domestic and foreign practice.

According to the main provisions of the investment theory, the process of implementing environmental projects is usually long-term. It has certain specific limitations specific to these projects and is accompanied by the appearance of consequences of various origins, namely:
necessary investment funds for project implementation;  
- necessary material costs during project implementation;  
- expected positive economic results;  
- negative or positive environmental consequences;  
- additional positive results that can generated in related sectors of the economy [1].

Economic science has extensive experience in developing and using various indicators for assessing the effectiveness of capital investments in investment projects. Traditional approaches to evaluating the effectiveness of assets are based on three methods: calculations of the payback period of capital investments, discounted costs, and cash flow. Historically, they developed in the direction of specifying the economic situation and conditions for evaluating the effectiveness of assets [2].

The basis of decision-making on implementing an investment project is the assessment and comparison of the volumes of future investments and cash receipts. However, since these comparative indicators refer to different periods, the question of their comparability arises, considering inflationary processes, the forecasting horizon, etc. A comparison of future income and current cost indicators is possible due to discounting, but it should be noted separately that the specifics of environmental projects complicate this process. Because the value of financial resources decreases over time, and the equivalent value of natural resources, on the contrary, increases.

As you know, income discounting estimates future cash flows from current positions. The investor must have information about the income he will receive in the coming period and the maximum possible contribution to the project he can make today.

The indicator of net current income \((NPV)\) reflects the forecast estimate of the change in the economic potential of the enterprise in the case of acceptance for the implementation of the project. It is an essential absolute indicator that can be a reliable criterion when choosing the most effective among several alternative project options. The project’s profitability \((R)\) allows you to obtain a relative efficiency indicator; that is, it characterizes the value of the reduced gross income received for each hryvnia of discounted economic costs for the entire project implementation period. The project’s profitability is understood as such a value of the discount factor at which the indicator of net current income \((NPV)\) will be equal to zero. The meaning of this coefficient consists of the fact that the project’s profitability shows the maximum permissible relative level of costs. The investment payback term \((DPP)\) is one of the simplest and most widely used in global practice, reflecting the period in which will return capital investments in the project. However, this indicator has several disadvantages; it does not consider the impact of income of final periods and is based on non-discounted estimates [3]. Evaluating environmental projects is especially difficult because these projects have minimal commercial results. At the same time, many enterprises implement such projects in their activities, the consequences of which are felt over a long period. Therefore, they can define their goal as obtaining intermediate results in the technological chain. In some cases, such projects do not have a pronounced commercial effect but are decisive in implementing more global commercial projects.
The complexity and difficulty of evaluating investments in environmental projects is that since such schemes have both an economic effect and a social and ecological one, one must also consider the consequences. In cases where the project meets the economic impact criteria, it can be implemented even without environmental or social effects. In cases where this project has a minor or negative economic impact, the project should be considered from the standpoint of improving the ecological situation, rational use of natural resources, and increasing the general public welfare. If such an effect is significant, then we can talk about the implementation of the project with the help of budget or fund financing.

The existing methods assume a comprehensive evaluation of the effectiveness of the summation of individual types of effects:

\[ E_{\text{compl}} = E_{\text{econom}} + E_{\text{ecol}} + E_{\text{soc}} \]  

where,  
\[ E_{\text{compl}} - \text{the complex effect of the implementation of environmental projects;} \]
\[ E_{\text{econom}} - \text{the economic impact of the implementation of ecological projects;} \]
\[ E_{\text{ecol}} - \text{the environmental effect of the implementation of environmental projects;} \]
\[ E_{\text{soc}} - \text{the social effect of the performance of ecological tasks.} \]

Moreover, both positive and negative ecological, economic, and social consequences of implementing environmental projects influence the result of the calculation of the complex effect. In particular, the positive effects include reduction of current costs, increase in the volume of product sales, prevention of environmental damage, improvement of the situation with the disease of the population as a result of reducing the pollution of the surrounding environment, the release of additional areas of land plots, etc. In turn, the negatives include the formation of the necessary amount of funds for the implementation of the project, the appearance of environmental damage from secondary pollution, etc.

The effect of implementing environmental projects is often determined by the difference between the results and the costs of carrying out a specific event.

\[ E = R - \text{Exp} \]  

where,  
\[ E - \text{effect of project implementation;} \]
\[ R - \text{the result of project implementation;} \]
\[ \text{Exp} - \text{project implementation costs.} \]

Therefore, taking into account formula 2, the mechanism of formation of a complex of costs and results from the implementation of environmental projects and the time factor, formula (1) will have the form:

\[ E_{\text{compl}} = (R'_{\text{econom}} - \text{Exp}'_{\text{econom}}) + (R'_{\text{ecol}} - \text{Exp}'_{\text{ecol}}) + R'_{\text{soc}} \]  

where,  
\[ R'_{\text{econom}} - \text{the economic results from the implementation of the environmental project, which obtained in the year of project implementation;} \]
\[ \text{Exp}'_{\text{econom}}, \text{Exp}'_{\text{ecol}}, \text{Exp}'_{\text{soc}} - \text{the same as above.} \]
\( \text{Exp}_{\text{econ}}^{\text{t}} \) – the economic costs during the implementation of the environmental project, which were received in the year of project implementation;
\( \text{R}_{\text{ecol}}^{\text{t}} \) – the ecological results from the performance of the environmental task, which was obtained in the year of project implementation;
\( \text{Exp}_{\text{ecol}}^{\text{t}} \) – the ecological costs during the implementation of the environmental project, which were received in the year of project implementation;
\( \text{R}_{\text{soc}}^{\text{t}} \) – the social results from the ecological task’s performance, obtained in the project implementation year.

Separately, there are potential social results from implementing such projects, but evaluating these results in terms of monetary equivalents is impossible.

In modern methodological normative documents, there were attempts to evaluate the effectiveness of this kind of project and efforts to take into account the economic interests of various project participants or interested persons [4,5].

Characterize the positive effect by reducing the destructive impact on the environment, reducing production and, as a result, conservation of natural resources, gradual restoration of ecological balance, and reduction of artificial load. Important social factors of the practicality and importance of environmental investments are the increase in the population’s life expectancy, removal of morbidity, improvement of working conditions, preservation of natural landscapes, etc. [6].

Also, there is a fundamental difference between economic and environmental resources over time; namely, the value of financial resources removed from production activity decreases, while the importance of environmental factors, on the contrary, increases, so we believe that when evaluating the economic component, it is appropriate to use the discount factor, and when assessing the ecological part, the accrual factor.

References: