

About the Evaluations of the Environmental Protection Activities' Effectiveness

O ocenach skuteczności działań na rzecz ochrony środowiska

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Received: 02 Jul, 2022; Revised: 28 Nov, 2022; Accepted: 12 Dec, 2022

Abstract: A few contemporary examples can be found in various publications to provoke a more profound reflection on the assessment of environmental action. Whatever methodology is used to determine the importance of all types of environmental activities and assess their effectiveness, specific approaches must be adopted. It is crucial to understand that "environmental activities" are not just an appendage to the science of "ecology." They also represent a specific period in the development of the world, in the second part of the 20th century, during which specific assessments of the effectiveness of human activities are necessarily provided. The science of ecology usually deals with such concepts as biotic, abiotic, and anthropogenic factors. They should account for the specific conditions, impacts, and effects on ecosystems. However, such concepts are also used in other disciplines, which have interests in this field. Therefore, the material in this article will address some critical issues connected to the assessment of the effectiveness of environmental actions.

Keywords: water, environmental protection, anthropogenic impacts, effectiveness assessments, watercourses, expenditures, costs

Streszczenie: Wśród najnowszych publikacji naukowych przynajmniej kilka zachęca do głębszej refleksji nad oceną działań na rzecz ochrony środowiska. Niezależnie od metodologii stosowanej do zdefiniowania siły wpływu różnych przedsięwzięć na środowisko, konieczne jest opracowanie sposobu oceny ich skuteczności. Należy przy tym pamiętać, że "działania środowiskowe" nie są tylko dodatkiem do "ekologii"- nauki, w której operuje się jedynie takimi pojęciami, jak czynniki biotyczne, abiotyczne i antropogeniczne w celu opisanego różnych warunków, oddziaływania i wpływu na ekosystemy. Działania na rzecz środowiska zostały zapoczątkowane w szczególnym momencie w rozwoju naszej cywilizacji (w drugiej połowie XX wieku), w którym ocena ich skuteczności była wysoce pożądana. Z tego względu w artykule poruszono kluczowe kwestie dotyczące oceny skuteczności działań prośrodowiskowych.

Słowa kluczowe: woda, ochrona środowiska, oddziaływania antropogeniczne, oceny efektywności, ciekły wodne, nakłady, koszty

Introduction

Several recent studies provoke serious reflection on the assessment of actions in the field of environmental protection (Bojinov et al. 1990; Costamagno et al. 2016; National Statistical Institute of the Republic of Bulgaria 2021). Various examples can be found in publications concerning the existing assessment. Some of them are purposely focused on the assessment of environmental activities, and the results show that it is necessary to conduct serious analysis of their effectiveness. Taking into account the new conditions, demographic and anthropogenic problems, much more serious work is needed in studying, analyzing, implementing, and assessing the results to evaluate environmental protection activities.

It is no longer enough to include among the well-known biotic and abiotic factors for ecology, the so-called anthropogenic factors, and thus to end considering the nature and significance of environmental protection activities.

In this regard, it is worth commenting on the practice of explaining various laws in the field of ecology, i.e., the law of the minimum, the law of tolerance, or the law of joint action of environmental factors (Shelford 1931) – Fig. 1, without trying to understand the essence of environmental protection as a specific scientific field, and as a niche for economic realization and social events, etc.

Whatever methodology is used to determine the importance of all types

of environmental activities, it is crucial to focus mainly on their effectiveness.

Thus, it is essential that the term “Ecology and Environmental Protection” must be thoroughly revised in view of the misconception that environmental protection is an appendage to the science of “ecology.” Despite the belittling, we should remember that in the last 30 years of the 20th century, a specific scientific field has been formed, without which it is difficult to hope for environmentally friendly development of societies in the future. Therefore, “environmental protection” should not be neglected but should be considered a commitment of the “present to the future.”

There is a need for more serious consideration of the role of fundamental laws in ecology and environmental protection, especially in connection with justification and evaluation of the effectiveness of specific activities to limit anthropogenic impacts (avalanche-like) in modern society. The increasing number of campaign techniques in environmental protection activities cannot fulfill their essence and, more importantly, provide an opportunity for an accurate assessment of the effectiveness of such activities. The goal is not to report expenses but to generate revenue. Regarding this situation, it is appropriate to note the fact that the National Statistical Institute system (NSI) in Bulgaria (National Statistical Institute of the Republic of Bulgaria 2021) still maintains a platform “expenditures for

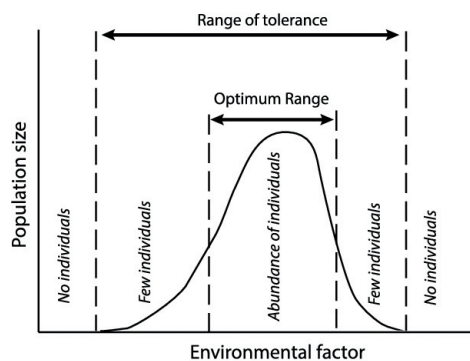


Figure 1. Graphical representation of Shelford's Law of Tolerance (Shelford 1931)

the restoration and protection of the environment.” It is crucial that this situation should be changed. Conservation supports restoration of the environment, and for this purpose, specific activities must be carried out. For example, there are conflicting arguments for including data on “circulating water supply” in environmental protection activities, as such practices are part of the “rational use of water resources,” and it is not very logical to link it to “environmental protection.”

This is reflected in the information presented in Fig. 2 – “expenditures for the protection and restoration of the environment” in the period 2010-2020 that allows more serious consideration of this type of activity, for which it is crucial to explain the appropriateness of the measures, i.e., the need of an economic assessment of benefits, i.e., effectiveness.

However, if this information is further analyzed, one (rather unpleasant) finding can be that less than 1% of all mentioned expenditures are spent on research and educational activities.

Based on this finding, one more thing should be concluded, namely that, as regards environmental protection, no serious attention has been paid to certain activities. This can be considered as an argument for adopting a much more accurate evaluation

of the effectiveness of activities in the field of environmental protection.

This can be confirmed by the distribution of resources spent on environmental impact assessment compared to the costs of environmental protection, presented in Fig. 3.

Based on such information there arises the question of the meaning and evaluation of environmental protection activities, and the logical conclusion is that no good results can be expected in this respect when the sustainable results lack solid scientific base.

This proves the need for a substantial research base which would allow to implement practical programs and plans following specific justifications and evaluations of their effectiveness.

1. Materials and methods

We should pay attention to the rationale for the nature of environmental impact assessment (EIA) activities. It is inexplicable why the Environmental Protection Act of the Republic of Bulgaria (Act 2002) provides for provisions on environmental impact assessments when, through the implementation of “plans, programs and investment proposals for construction, activities, and technologies or their amendments, the implementation of which is possible significant impacts” on the environment. It seems that

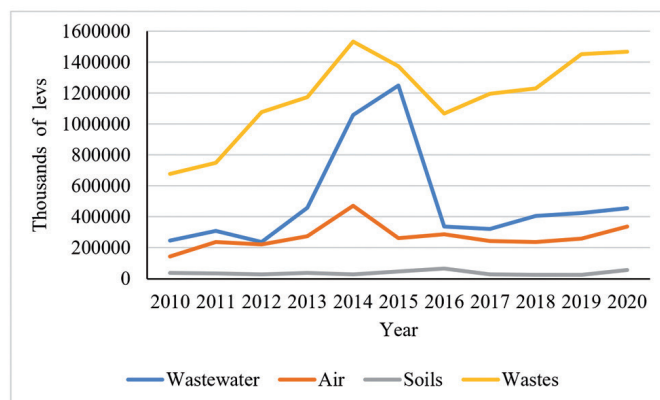


Figure 2. Expenditures for the protection and restoration of the environment (National Statistical Institute of the Republic of Bulgaria 2021)

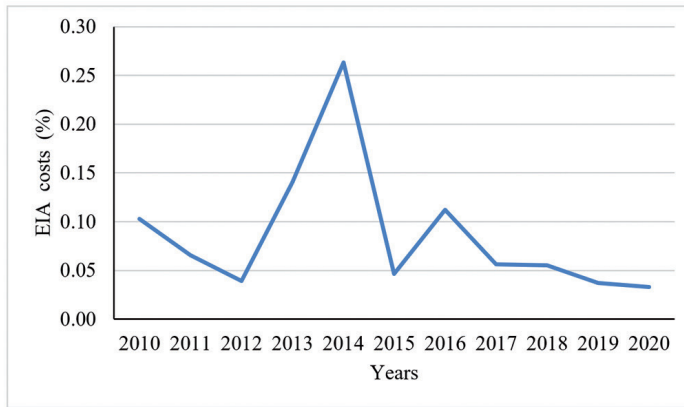


Figure 3. Resources spent on environmental impact assessment (EIA as %) compared to the costs of environmental protection (National Statistical Institute of the Republic of Bulgaria 2021)

this law applies to “significant impacts” but not to “minor” or other types of impacts.

Considering the stated position, it is imperative to pay attention to the nature of environmental protection activities. In the conditions of the increasingly emerging anthropogenic impact, it is especially necessary to understand that the idea that environmental activities are easily feasible is deeply flawed.

As regards various activities in this field, it is imperative to evaluate their results, i.e., to evaluate their effectiveness. Therefore, it is appropriate to take a much more serious approach and to analyze similar approaches applied in other sectors of the Company’s economy.

In the centuries-old history of economic development, attention has always been paid to the value of output. The value expressed the causal link between the price of the product produced and the costs necessary for its production.

On this basis, the value of each product can be represented as:

$$Pr_{ij} = R_{ij} + S_{ij} + L_{ij} \quad (1)$$

where:

Pr_{ij} – the value of any product (i) of any company (j);

R_{ij} – resources (raw materials) for a given product (i) of a company(j);

S_{ij} – service (electricity, water, heating) in the production of a given product (i) of a company (j);

L_{ij} – labor to produce any product (i) of a company (j).

There are three main groups of factors in this relationship, all three being related to our environment. In general, marketing of all types of production should consider these factors.

The assessment of raw materials (resources) is absolutely mandatory in the marketing of any activity related to the production of all types of products. Due to the limitations that stand out in the future, it is necessary to pay even more attention to this factor. But such attention must be paid also to the other two groups of factors. The inclusion of these factors is mandatory, both in the assessments of marketing activities and of those related to the protection of the environment. The presented dependence (1) is general for all types of marketing, as it covers and reflects the main influencing elements in the production of products. However, this does not cover all groups of factors relevant to environmental impact assessments.

Therefore, it is appropriate to work on this dependence (1) to assess the effectiveness of different types of activities in marketing and environmental protection. There

are many examples of expressing efficiency in different terms, for example, in the law of the Court of Auditors (Act 2004).

2. Results

Additional provisions are introduced, such as "efficiency" and "economy." They can help to refine some activities of the Court of Auditors (Act 2004), but for the needs of the proposed research, it is appropriate to deal with the effectiveness of the various types of activities:

$$E_{te, ij} = E_{pr, ij} + E_{sup, ij} + E_{le, ij} + E_{tr, ij} + E_{mar, ij} + E_{cons, ij} = \max \quad (2)$$

where:

$E_{te, ij}$ – total efficiency of the activity for a given product (i) in a given company (j);

$E_{pr, ij}$ – efficiency in the production of a product (i) in a company (j);

$E_{sup, ij}$ – efficiency in providing support (service) activities ensuring the production of a product (i) in a given company (j), for example, electricity, water, heating, and others;

$E_{le, ij}$ – labor efficiency in the production of a product (i) in a given company (j);

$E_{tr, ij}$ – efficiency in the transport of a product (i) in a company (j) to retail outlets or consumers;

$E_{mar, ij}$ – efficiency in the realization of a given product (i) in a given company (j) on the market;

$E_{cons, ij}$ – efficiency at the consumer of a product (i) in a company (j) representing if his needs are met and to what extent.

As a variant of the above dependence, it can also be presented as a dependence for assessing the appropriateness of costs throughout the production-market-consumer chain:

$$C_{\nu, ij} = C_{p, ij} + C_{anc, ij} + C_{l, ij} + C_{tr, ij} + C_{mark, ij} + C_{cons, ij} = \min \quad (3)$$

where:

$C_{\nu, ij}$ – total cost of a product (i) in a company (j);

$C_{p, ij}$ – total costs of production of a product (i) in a company (j);

$C_{anc, ij}$ – total costs of providing ancillary activities, providing the production of a product (i) in a company (j), for example, electricity supply, water supply, heating, etc.;

$C_{l, ij}$ – total labor costs in the production of a product (i) in a given company (j);

$C_{tr, ij}$ – total transport costs of a product (i) in a company (j) to retail outlets or to consumers;

$C_{mark, ij}$ – total costs of selling a product (i) in a company (j) on the market;

$C_{cons, ij}$ – total costs to the consumer of a product (i) in a company (j) – (Are his needs met and to what extent).

3. Discussion

By summarizing all of the above, it is possible to seek an opportunity to evaluate environmental activities, for example, through the attitude

$$E = \frac{R}{C} \quad (4)$$

where:

E – is the efficiency;

R – revenues from the efficient production of goods and services;

C – costs incurred for the specified activities.

A great variety of activities in society, valued through the prism of production and consumption, should be complemented by the activities of environmental protection, i.e., for these types of activities, it is imperative to look for efficiency in their implementation.

The essential point of this idea is to evaluate the activities for environmental protection both in terms of the costs but also in terms of the achieved results, i.e.

$$E_{ep} = R_{ep} + C_{ep} \quad (5)$$

where:

E_{ep} – the efficiency of the implemented activities under environmental protection;

Rep – revenues and profits from environmental protection activities (including intangible);

C_{ep} – the costs of these activities.

Through the above proposals and their implementation in practice, we can hope for better or (more effective) results from the various activities in the field of environmental protection. In this connection, it is pertinent to recall a quotation from Carl Jung (1875-1961), namely “We cannot change anything unless we accept it” (Jung 1985).

Conclusion

For the environmental protection activities, it is imperative to develop a severe research procedure to justify the relevant actions and their implementation concerning their effectiveness.

This can be obtained by accounting for the revenues and costs of producing goods and services regarding environmental protection activities. On this basis, the proposed equation (4) should be presented in the following form

$$E = \frac{R+R_{ep}}{C+C_{ep}} \quad (6).$$

This provides an opportunity for a more effective evaluation of the results of various environmental activities allowing the same not to be considered only as an initiative of individual campaigns or initiatives of NGOs.

Presented dependencies provide opportunities for various administrative structures, interested organizations, and companies to report, engage (according to their interests), and implement various environmental activities that are more effective, i.e., to generate profits, not just to account for costs.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Conflicts of Interest: The author declares no conflict of interest.

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