ECOLOGICAL EXPERTISE AND ENVIRONMENTAL IMPACT ASSESSMENT: REFLECTIONS ON CHALLENGES, APPROACHES, AND CROSS COUNTRY DIFFERENCES

EXPERTIZA ECOLOGICĂ ŞI EVALUAREA IMPACTULUI ASUPRA MEDIULUI: REFLECŢII ASUPRA PROVOCĂRILOR, ABORDĂRILOR ŞI DIFERENŢELOR ÎNTRE ŢĂRI

DOI: 10.5281/zenodo.14714145
UDC: 811.111:502/504

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Rezumat

Scop: *Acest articol analizează legislaţia mondială care reglementează evaluarea impactului asupra mediului, dar* şi *atribuţiile autorităţilor publice legate de acest subiect. Cercetând rezultatele obţinute pe parcursul implementării legislaţiei* în *domeniu, putem deduce că existenţa cadrului legal nu garantează pe deplin* îndeplinirea *cu succes a unei proceduri, iar* în *acest caz implementarea evaluării impactului asupra mediului. Evaluarea impactului asupra mediului (EIM) este un proces care identifică, evaluează* şi *atenuează impactul asupra mediului al unui proiect propus. Acesta aprofundează rolul critic al controlului* şi *evaluării mediului* în *promovarea dezvoltării durabile. Scopul acestui studiu este de a elucida modul* în *care monitorizarea, evaluarea* şi *reglementarea factorilor de mediu sunt esenţiale pentru atingerea sustenabilităţii pe termen lung* în *diverse sectoare.*

Metodologie *Metodologia utilizată include o analiză cuprinzătoare a literaturii existente* şi *a celor mai bune practici* în *domeniul controlului* şi *evaluării mediului. Acest articol analizează provocările cu care se confruntă realizarea EIA, asemănările* şi *diferenţele dintre EIA din diferite* ţări şi *evoluţia eficienţei EIA de-a lungul timpului*

Constatări majore *Deşi legislaţia Republicii Moldova reglementează acest proces,* în *practică foarte puţine proiecte, fie ele publice sau private, sunt supuse evaluării impactului asupra mediului. La finalul articolului am propus câteva soluţii pentru a* îmbunătăţi *performanţa acestei proceduri de amploare. Acesta subliniază importanţa integrării considerentelor de mediu* în *procesele decizionale pentru un viitor mai durabil. Lucrarea subliniază importanţa controlului* şi *evaluării de mediu pentru atenuarea impactului activităţilor umane asupra mediului* şi *promovarea practicilor durabile pentru o coexistenţă armonioasă* între *dezvoltare* şi *natură.*

Cuvinte-cheie: *evaluare de mediu, dezvoltare durabilă, expertiză, documentaţie*

Abstract

Purpose: *This article analyzes the world legislation that regulates the environmental impact assessment but also the attributions of the public authorities related to this topic. By researching the results obtained during the implementation of the legislation in this field, we can deduce that the existence of the legal framework does not fully guarantee the successful execution of a procedure, and in this case the implementation of environmental impact assessment. Environmental Impact Assessment (EIA) is a process that identifies, assesses and mitigates the environmental impacts of a proposed project. It delves into the critical role of environmental control and assessment in fostering sustainable development. The purpose of this study is to elucidate how monitoring, evaluating, and regulating environmental factors are essential for achieving long-term sustainability across various sectors.*

Methodology *The methodology employed includes a comprehensive review of existing literature and best practices in environmental control and assessment. This article examines the challenges faced in carrying out EIAs, the similarities and differences between EIAs in different countries, and the evolution of EIA effectiveness over time*

Major findings *Although, the legislation of the Republic of Moldova regulates this process, in practice very few projects, whether public or private, are subject to environmental impact assessment. At the end of the article I have proposed some solutions to improve the performance of this large procedure. It highlights the importance of integrating environmental considerations into decision-making processes for a more sustainable future. The paper emphasizes the significance of environmental control and assessment in mitigating the impact of human activities on the environment and promoting sustainable practices for a harmonious coexistence between development and nature.*

Key words: environmental assessment, sustainable development, expertise, documentation

Introduction

The diversity and complexity of environmental problems require the use of a variety of methods to solve them. Eventually, a number of principles have emerged in the process of developing and implementing environmental protection regulations, including the principle of environmental degradation, which is based on the idea that preventing pollution is less expensive than repairing the damage and combating the destructive effects of pollution. For these reasons, the planning of certain activities that may have an impact on the environment, such as - industrial activities, draft laws that will allow the development of activities that present an increased risk of affecting the components of nature, are subject to certain initial assessments. However, taking into account the fact that not all activities present the same degree of risk, it has been found that the application of fair rules is only possible after some technical-scientific findings have

been made in environmental matters, called ecological expertise.

So, in the context described above, we sometimes ask ourselves the questions: "What is ecological expertise? "and "What is environmental impact assessment?" since these 2 notions express similar activities.

Ecological Expertise and Environmental Impact Assessment: Evolution and Challenges

According to Article 1 of Law 851/1996, ecological expertise is a type of activity in the field of environmental protection, consisting in the prior assessment of the expected economic impact on the state of the environment, the conformity of the parameters of these activities with the laws, regulations and standards in force. However, according to art. 1 of Law No. 86/2014, by environmental impact assessment we mean the procedure carried out in accordance with this Law to assess the possible effects of the planned activity on the environment, as well as the elaboration of proposals for the prevention and minimization of the negative effects or, in case of violation of the requirements provided for, in this Law, for the prohibition of the commencement of the planned activity.

Obviously, these two concepts reflect similar content only in terms of the prior assessment of possible environmental impacts, but the concept of "impact assessment" also includes proposals for the prevention and minimization of negative impacts. Therefore, although the environmental impact assessment is a stage of the environmental expertise, its purpose is realized through a wider range of activities and tasks whose main objective is to prevent and minimize the negative impact.

Environmental Impact Assessment (EIA) is the process of identifying, assessing and mitigating the environmental impacts of a proposed project. The history of EIA can be traced back to the National Environmental Policy Act (NEPA) of 1969 in the United States, which required federal agencies to prepare Environmental Impact Statements (EISs) for proposed projects that would have a significant impact on the environment. The success of NEPA led to the creation of the Environmental Protection Agency (EPA) in 1970. In the UK, EIA was formally introduced in 1988 through its inclusion in the Town and Country Planning (Assessment of Environmental Effects) Regulations for England and Wales and the Environmental Assessment Regulations for Scotland and Northern Ireland, based on European Directive 85/337/EC. India's experience with EIA began in 1976-77 when the Planning Commission asked the De-

partment of Science and Technology to prepare guidelines for environmental clearance of river valley projects. Since then, EIA has evolved and expanded to include various forms of impact assessment, such as Health Impact Assessment (HIA) and Social Impact Assessment (SIA). The future of EIA is uncertain, with some countries shifting their focus from addressing environmental harm to ensuring specific environmental outcomes, carrying out the ecological expertise goes through the following stages:

1. Environmental impact assessment.
2. Initiation of expertise.
3. Presentation of project documentation, environmental assessment documentation, as well as other necessary documentation.
4. Examining the documentation.
5. Issuance of the opinion.

The Environmental Impact Assessment (EIA) is indeed a critical step in any economic activity. It ensures that the beneficiary of the activity takes responsibility for documenting and organizing the potential effects on the environment. This evaluation process goes beyond just identifying direct impacts; it also considers indirect effects, such as synergistic and cumulative impacts on both human health and the environment. By conducting this assessment, the beneficiary can gain a comprehensive understanding of the potential consequences of their project. Moreover, it is essential to conduct the assessment in accordance with current legislation. This ensures that the evaluation process follows the guidelines and regulations set by the governing bodies responsible for environmental protection. Adhering to these legal requirements helps to maintain environmental sustainability and prevent any adverse effects that may arise from the economic activity. In summary, (EIA) impact is a crucial stage that involves documenting and organizing the potential effects of an economic activity on the environment. It encompasses both direct and indirect impacts, including synergistic and cumulative effects on human health and the environment. By conducting this assessment in accordance with current legislation, the beneficiary can ensure compliance with environmental protection regulations and contribute to sustainable development. (Marinescu,2008) Impact assessments play a crucial role in ensuring that planned activities are carried out in a manner that safeguards the environment and public health. By conducting these assessments, organizations can identify and evaluate potential negative impacts that may arise from their activities. This allows them to develop appropriate measures and strategies to prevent or mini-

mize these impacts. During the impact assessment process, various factors are considered, such as the potential release of pollutants, the depletion of natural resources, and the disturbance of ecosystems. By thoroughly analyzing these factors, organizations can gain a comprehensive understanding of the potential risks and impacts associated with their planned activities. Once the potential impacts have been identified, measures can be put in place to prevent or minimize them. These measures may include implementing pollution control technologies, adopting sustainable practices, or establishing mitigation plans. By taking proactive steps to address potential negative impacts, organizations can ensure that their activities are carried out in an environmentally responsible and socially conscious manner. Furthermore, impact assessments also provide an opportunity for public participation and consultation. This allows stakeholders, including local communities and environmental groups, to voice their concerns and provide valuable input into the decision-making process. By involving the public, organizations can ensure that their activities are aligned with the needs and expectations of the community, fostering transparency and accountability. In summary, the purpose of conducting an impact assessment is to identify, evaluate, and address potential negative impacts on the environment and public health. By doing so, organizations can implement measures that prevent or minimize these impacts, ensuring the sustainable and responsible implementation of planned activities.

Before discussing the method and necessity of environmental impact assessments, it is important to specify the conditions and obligations for conducting such assessments. It should be noted that environmental impact assessments are a stage of the expertise process. Therefore, the necessity of an environmental impact assessment depends on whether the expertise is mandatory or not. It is important to note that by law, environmental impact assessments are mandatory in certain specific cases. Additionally, it is mandatory to conduct an Environmental Impact Assessment in the case of expertise.

Thus, for the project and planning documentation on designed objects and economic activities that influence or may influence the state of the environment and/or provide for the use of natural resources, irrespective of the destination, location, type of ownership and subordination of these objects, the volume of capital investments, the source of financing, and the manner of execution of construction works, the environmental expertise of the state is mandatory. In accordance with the same formula, Law no. 86/2014 establishes a list of planned activities

that are subject to mandatory environmental impact assessment, as well as a list of activities that are exempt from impact assessment. It should be noted that ecological expertise can be conducted without an impact assessment on the environment in cases expressly provided for by law.

The documentation regarding the EIA is drawn up based on the normative acts in force, in accordance with the coordinated program for carrying out the EIA and taking into account the comments made by the public regarding the results of the primary information regarding the planned activity. The documentation regarding the environmental impact assessment will contain at least the following information:

a) *the description of the planned activity*, including the description of the physical activities and the land use requirements during the construction and operation phases; the description of the main characteristics of the manufacturing processes, the estimation, depending on the type and quantity, of the residues and potential emissions (air, soil and subsoil pollution, noise, vibrations, thermal and radioactive radiation, etc.) results from the planned activity and information about the place of the planned activity and its dimensions;

b) *a comparison of the main alternatives* examined (including the option of abandoning the planned activity) and the main reasons underlying the choice of one or another alternative, taking into account the effects on the environment;

c) *a description of the current state of the environmental elements,* which could be significantly affected by the planned activity, including, in particular, the population, flora, fauna, soil, subsoil, air, climatic factors, material goods, including the archaeological heritage and architecture, the landscape and the relationships between all these factors. The description should provide sufficient details to determine the initial state of the environment in the area of the planned activity.

d) *a description of the types and consequences of the potential impact* of the planned activity on the environment and their dimensions. The description will include the direct and indirect effects, both positive and negative, and their various dimensions. This includes secondary, cumulative, short-term, medium-term, long-term, permanent, and temporary effects.

e) *the estimation methods* used to evaluate the impact on the environment;

f) *the measures expected to avoid, reduce, and if possible, remedy the negative impact* on the environment;

g) *The measures to prevent and liquidate the consequences* of possi-

ble exceptional situations and accidents;

h) *the necessity of carrying out or not carrying out the post-project analysis* and determining, in the case of the need to carry out the analysis, the indicators and the deadlines;

i) *a non-technical summary* of the information mentioned above (points a-h);

j) *indication of any difficulties (technical deficiencies or lack of professional knowledge)* encountered by the initiator when synthesizing the necessary information.;

k) *report on public participation*

l) *clear and concise conclusions.*

The process of the Environmental Impact Assessment (EIA) documentation can be carried out by legal entities that have the right to carry out this type of activity. Based on the results of the examination of the Environmental Impact Assessment documentation, the opinions of the central and local public administration authorities, of other interested institutions as well as taking into account the comments submitted by the public in written form and the results of public consultations, the competent authority approves one of the following decisions:

It either:

a) issues the environmental agreement

b) sends the documentation regarding the environmental impact assessment to the initiator of the planned activity for finalization:

c) refuses to issue the environmental agreement.

The authorities empowered to issue permissive acts must mandatorily take into account the conditions indicated in the environmental agreement. This includes presenting the necessary documents for the initiation of ecological expertise, as required by law. The environmental agreement holds an intermediate position between approvals and authorizations, with a specific legal profile due to the pursued purpose and applicable legal regime (Dutu,2010). It remains valid for four years according to some opinions. (Trofimov Ardelean, Cretu,2015) If the initiator has not obtained the necessary permit for the planned activity by the end of the mentioned term, they will need to restart the entire environmental impact assessment process, beginning with the submission of the application.

Initiation of Expertise

The initiation of expertise refers to the beginning stages of acquiring knowledge and skills in a particular field or domain. It is the start-

ing point where individuals embark on a journey to become experts in their chosen area. During the initiation phase, individuals often display a strong interest and curiosity in the subject matter. They may engage in activities such as reading books, attending workshops, or seeking guidance from experienced professionals. This initial enthusiasm drives them to explore and learn more about the intricacies of the field. As the initiation progresses, individuals start to develop a foundational understanding of the subject. They become familiar with key concepts, terminology, and theories that form the basis of the expertise they are seeking to acquire. This phase is crucial as it lays the groundwork for further learning and skill development. Moreover, the initiation of expertise involves setting goals and objectives. Individuals may identify specific areas they want to focus on and outline a plan to achieve their desired level of expertise. This could include identifying resources, finding mentors, or joining communities of practice to enhance their learning experience. It is important to note that the initiation of expertise is just the beginning of a long and continuous journey. Becoming an expert requires dedication, perseverance, and a commitment to lifelong learning. As individuals progress through the initiation phase, they gradually move towards more advanced stages of expertise, building upon their initial knowledge and skills.

The method of initiating the expertise and the subjects of who has the right to initiate the ecological expertise depend on the type of expertise.

The Public ecological expertise is organized and carried out at the initiative of officially registered public associations with a profile of environmental protection and whose statute provides for the performance of public ecological expertise. Ecological expertise can be conducted for all projects and documents related to expected economic activities, except for those related to state security or containing state, commercial, or other legal secrets.

The Department of Ecological Expertise and Environmental Authorizations initiates the state ecological expertise at the applicant's request. According to paragraph 2 of Law no. 851/1996, (Republic of Moldova), the state ecological expertise is the sole responsibility of the Central Authority for the Environment. The Central Authority orders its structural divisions (the State Ecological Inspectorate) and/or other subordinate organizations that constitute the state ecological expertise system to perform it.

Presentation of the documentation for the expertise

The beneficiary presents for examination, to the respective body of the state ecological expertise system, the complete documentation

regarding the expected economic activity, in the manner established by the central authority for the environment. The design and planning documentation must comply with current regulations and include the necessary authorizations from the local public administration and relevant organizations regarding the location and technical specifications of the proposed object. Additionally, it should include the opinions of state supervision and control bodies regarding the expected economic activity.

Speaking about the procedure for carrying out the ecological expertise, we will focus in particular on the state ecological expertise, given the fact that this is a mandatory one.

The state ecological expertise is carried out taking into account the opinions of the hygiene and epidemiology centers of the Ministry of Health and the opinions of other state supervision and control bodies. When dealing with objects that require changes to the environment or its components, along with project documentation, the beneficiary must provide a document confirming the agreement of the population residing within the perimeter of the sanitary protection zone of the respective object. This document should confirm their agreement with the object's location or the completion of certain technological processes. This document is based on either collected signatures or meeting minutes from the residents of the sanitary protection area. The ecological expertise of the project documentation and planning for capital construction, urbanism, and territorial development is conducted by the Ministry of Construction and Regional Development before the final examination of the documentation as a whole. The documentation submitted for the initial state ecological assessment must be accompanied by a bank document proving payment to the State Budget for the expenses related to the assessment. The amount should be calculated according to the methodology approved by the central authority for the environment.

Examination of the documentation

The project and planning documentation presented for the state ecological expertise undergoes a comprehensive examination. This examination takes into account ecological, economic, and social factors. The technical solutions proposed to meet ecological requirements are rigorously studied in the context of regional particularities. The goal is to maintain the stability of natural ecosystems during the entire period of development of the expected economic activity, including the construction of the object, its exploitation, demolition, or liquidation.

During the examination of the presented documentation, the fol-

lowing aspects are taken into consideration and eventually-assessed:

a) the accuracy of the assessment of the expected economic activity's impact on the environment, and

b) the motivation behind the need to carry out the expected economic activity on the chosen land and the method of carrying out this activity.

c) The technical, engineering, architectural, and urban solutions proposed, as well as the recommendations for the use of raw materials, energy, and natural resources, will be discussed.

d) The effectiveness and sufficiency of measures to prevent equipment damage and environmental pollution, as well as emergency interventions to mitigate the consequences of pollution, will be evaluated.

e) Efficient methods for water purification to be implemented, and untreated wastewater to prevent from being discharged into water basins.

f) New methods to be introduced to restore soil fertility, improve, recultivate land, and prevent erosion.

g) The effective preservation and supplementation of genetic backgrounds and biodiversity is crucial for optimizing the structure of the animal and plant kingdoms in natural ecosystems. This includes the use of means to protect fish resources, their reproductive technologies, as well as methods for ecological recovery and forest regeneration.

h) Advanced technologies should be employed to minimize the amount of industrial waste resulting from the use of mineral resources.

i) the effectiveness of technical solutions for processing, recycling and burial of industrial, household and agricultural waste, revealing the possibilities of regional cooperation in this field;

j) application of the recommended control methods to ensure the ecological safety of the expected economic activity and the standard quality of the environment;

k) the development of measures to prevent or minimize the ecological consequences of the realization of the project.

Failure to comply with the provisions of legislative acts and other normative acts, as well as the instructions, regarding the volume and content of the documentation presented for the state ecological expertise, constitutes grounds for returning the documentation to the beneficiary for completion and improvement.

However, conducting an EIA can present a number of challenges (ISO,.2006) including

1. *Obtaining reliable and relevant data*: Collecting accurate and relevant data on the baseline of environmental and social conditions, as well as the expected impacts of the project and mitigation measures, can be challenging.

2. *Inconsistent approach*: There is a significant barrier in the current environmental assessment regime due to the inconsistency of approach between EIA assessment and Strategic Environmental Assessment (SEA).

3. *Scope*: The scope of environmental assessment has become too broad and there is a need to refocus on the most relevant environmental impacts.

4. *Subjectivity:* The overall ethos of what environmental assessment is trying to achieve can be clouded by subjectivity.

5. *Choice of methods*: The choice of methods to assess the impacts of a project can range from qualitative to quantitative, from simple to complex, from generic to specific, and from deterministic to probabilistic. The choice of method depends on the objectives, scope and context of the EIA, as well as the availability, quality and uncertainty of the data.

6. *Stakeholder engagement*: Ensuring an open dialogue with affected communities and regulators is critical to successful EIA.

7. *Data collection:* Using state-of-the-art sensors and analytics can help minimise gaps and uncertainties in data collection

8. *Mitigation and monitoring*: Implementing streamlined, cost-effective solutions that can adapt to unforeseen or long-term impacts is essential for effective EIA.

To address these challenges, guidance and support are needed to build confidence in the EIA process and ensure its effectiveness in achieving the desired environmental outcomes. However, the effectiveness and compatibility of EIA systems remain largely unknown, especially across the diverse ecological, social, and cultural contexts.[1]

EIA Differences Between Countries

Environmental Impact Assessments (EIAs) differ between countries due to a number of factors, including legal frameworks, regulatory bodies, and cultural and socio-economic contexts. Some key differences in EIA processes between countries include

Legal framework: Legal frameworks for EIAs vary widely between countries, with some countries having more stringent regulations and others having less developed systems.

[1] A Guide to approaches, experiences & information sources- Life Cycle Assessment.1997. European Environment Agency

Regulatory bodies: The agencies responsible for carrying out EIAs can vary from country to country, with some countries having dedicated environmental agencies and others relying on several agencies or departments.

Cultural and socio-economic contexts: The cultural and socio-economic contexts in which EIAs are carried out can influence the process, with some countries placing more emphasis on public participation and others focusing more on technical assessments.

Scope: The scope of EIAs can vary between countries, with some countries focusing on specific environmental impacts and others considering a wider range of impacts, including social and economic factors.

Stakeholder engagement: The level of stakeholder involvement in EIAs can vary between countries, with some countries prioritizing public participation and others relying more on expert opinion.

Assessment methods: The methods used to conduct EIAs can vary between countries, with some countries using more quantitative approaches and others relying more on qualitative assessments.

Enforcement and compliance: Enforcement and compliance mechanisms for EIA can vary between countries, with some countries having more robust systems to ensure compliance with EIA requirements.

These differences in EIA processes can lead to different levels of effectiveness in addressing environmental concerns and achieving sustainable development goals.

All environmental impact assessment activities are carried out and guided by a set of principles that objectively reflect the need for training. Therefore, we distinguish the following principles that govern the realization of the environmental impact assessment

a) The presumption that any economic activity or other foreseeable material activity involving the use of natural resources may cause damage to the environment This principle recognizes that activities involving the use of natural resources can lead to an imbalance in nature. At the same time, it serves as a reason to carry out the entire impact assessment activity, in other words, it is like a justification of the mistrust given to the person who expects to carry out an economic activity or to capitalize on environmental factors. (Dutu,2010)

b) Obligation to carry out the state ecological expertise before taking decisions on the achievement of objectives. The principle in question supposes the obligation that any activity involving the use of environmental factors must be subject to the state ecological expertise, which at

the same time constitutes a stage preceding the stage of realization of the project. At the same time, this principle implies the obligation to draw up the opinion of the ecological expertise.

c) Comprehensive assessment of the impact of the planned economic activity on the environment. The assessment of the possible impact on the environment takes into account the effect of all factors that may lead to a possible deterioration in the quality of the environment or, conversely, to an improvement in the quality of the environment.

d) Scientific substantiation, objectivity and legality of the opinion. According to these principles, all conclusions of the ecological report must be scientifically justified, based on the principles of environmental protection and justified in accordance with the ecological and economic interests of society.

e) Independence of state ecological experts and their responsibility and liability When making decisions on economic activities subject to ecological expertise, the state ecological expert shall not be influenced by anyone and shall be guided only by the legislation in force and his own convictions. The state ecological expert shall be responsible for the correctness of the assessment of the documents submitted for the expertise, the quality of the expertise, compliance with the conditions of the permit, compliance with the legislation on environmental protection, as well as for the protection of state, commercial and/or other secrets, legal instruments contained in the materials submitted for the state ecological expertise.

f) Participation of public health organizations and other subjects in the realization of ecological expertise. The exposed principle implies the realization of the possibility of carrying out the impact assessment activities by other subjects (departmental and public health) than the special body empowered by the state. Also, in case of necessity, public organizations can participate in the preparation of the ecological expertise.

g) Transparency and public consultation. It is particularly important to consult the public in the process of preparing projects concerning the development of the expected activities, and subsequently to ensure that the public has free access to information about the possible impacts following the implementation of these activities. (Marinescu,2008)

The Environmental Expertise System

When we speak of the system of ecological expertise, we have in mind those components which, when correlated, solve the tasks set for this institution (Legea nr. 86,2014)

Thus, the ecological expertise system includes two major categories of elements at the same time:

The types of ecological expertise and the functional structures for carrying out the expertise.

The types of ecological expertise and the structures responsible for their realization are respectively

1. **State Ecological Expertise** - carried out by the Central Authority for the Environment, represented by the Directorate of Ecological Expertise and Environmental Permits within the State Ecological Inspectorate.

2. Departmental Ecological Expertise, carried out by the ministries and departments interested in the problem.

3.Community Ecological Expertise, carried out by public associations with an activity profile in the field of environmental protection.

Environmental expertise refers to the knowledge and skills required to assess and manage environmental issues (Trofimov Ardelean, Cretu, 2015, p.138). It involves the application of scientific, technical, and social knowledge to address environmental challenges. Environmental expertise systems can take various forms, including expert panels, environmental impact assessments, and environmental management systems. These systems aim to provide guidance on how to tackle environmental challenges, equipping readers with tools to better understand the diversity of environmental knowledge and its implications. Environmental expertise systems can be used to identify and mitigate environmental hazards, assess the environmental impact of proposed projects, and develop strategies for sustainable environmental management. They are essential for ensuring that environmental issues are addressed in a systematic and effective manner, and for promoting sustainable development.

Measuring environmental literacy involves assessing various factors such as environmental attitudes, behavior and knowledge. Traditionally, environmental literacy has been measured using educational and psychological frameworks that may include dimensions such as system knowledge, action knowledge and efficacy knowledge. There is ongoing debate and research on best practices for measuring environmental knowledge, and several tools and technologies have been developed for this purpose. In addition, environmental literacy can be assessed through the impact of citizen science on environmental attitudes, behavior and knowledge. This multidimensional approach aims to provide a comprehensive understanding of environmental literacy and its implica-

tions. Each type of expertise has its role. For example, the State Ecological Expertise is the main link in the ecological expertise system because its opinion is binding, while the opinions of the departmental and community experts are only advisory. In addition, the execution of the state ecological expertise is mandatory, while the departmental and community ecological expertise is optional (Trofimov, Ardelean, Cretu, 2015, p.139).

Some common tools used to measure environmental literacy include (Turnhout,2019)

a) The Three-Dimensional Theory of Environmental Knowledge: This framework divides environmental knowledge into system, action and effectiveness dimensions, providing a comprehensive approach to assessing environmental expertise.

b) The 19-item Environmental Knowledge Test (EKT-19): This test is a brief, psychometrically sound measure of environmental knowledge that has been validated by researchers.

c) Instrumental Framework for Measuring Environmental Awareness: This framework includes various factors such as environmental attitudes, behaviors and knowledge and has been developed to measure environmental awareness.

d) Citizen science projects: Citizen science projects can be used to measure the impact of environmental knowledge on attitudes, behavior and knowledge, and provide insights into the effectiveness of environmental expertise systems.

These tools and frameworks can be used to assess environmental literacy in different contexts, such as educational settings, workplace training and public awareness campaigns. They help to identify strengths and weaknesses in environmental literacy and provide guidance on how to improve environmental literacy.

The European Commission's Impact Assessment Tools

The European Commission uses Impact Assessment (IA) in its policies to ensure that all major policy proposals include a Sustainability Impact Assessment (SIA) covering their potential economic, social and environmental impacts.

The IA process is based on integrated analyses of different policy concerns, such as the environment, the economy and society.

The Commission has introduced an internal system of Integrated Impact Assessment (IA) to address multiple policy concerns by assessing the likely environmental, economic and social impacts of all its major policies.

Key aspects of the European Commission's use of impact assessment in its policies include:

1. *Integrated analysis*: The IA process is based on integrated analyses of different policy concerns, such as the environment, the economy and society.
2. *Sustainability Impact Assessment*: The European Commission has established rules to ensure that Member States assess the likely significant environmental effects of certain large infrastructure projects and public plans through environmental assessments, including the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) Directives.
3. *Better Regulation Agenda*: The Better Regulation Agenda is about designing and evaluating EU policies and legislation in a transparent way. Impact assessments are carried out by Commission services in accordance with the related Better Additional Guidelines on the Analysis of Human Rights Impacts in Impact Assessments of Trade-Related Policies.
4. *Public consultation*: Impact assessments include an online public consultation of interested parties to gather input and feedback.
5. *Quality assessment*: The results of the impact assessment process are summarized in an impact assessment report, which is reviewed and commented on by an independent body, the Regulatory Scrutiny Board.
6. *Proportionality analysis:* The Commission has introduced a new impact assessment tool that integrates, strengthens, streamlines and replaces all existing separate practices, helping decision-makers to take better-informed decisions.[1]

Conclusions

Evaluation of the quality of Environmental Impact Assessment (EIA) reports, changes to projects as a result of EIA and the impact of changes to EIA procedures in European countries such as the UK, Germany, Spain, Belgium, Denmark, Greece, Ireland and Portugal has shown promising results. The overall proportion of "satisfactory" EIA reports sampled in these countries increased from 50% to 71% between 1990-1991 and 1994-1996.

The European Union (EU) has established rules to ensure that Member States assess the likely significant environmental effects of cer-

[1] https://home-affairs.ec.europa.eu/whats-new/evaluations-and-impact-assessments_en

tain large infrastructure projects and public plans through environmental assessments, including the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) Directives.

The European Commission has also applied impact assessment to its policies, aiming to consider simultaneously the economic, social and environmental impacts of proposals. The Commission has introduced an internal system of Integrated Impact Assessment (IA) to address multiple policy concerns by assessing the likely environmental, economic and social impacts of all its major policies Respectively, the evaluation of the performance of EIA systems in European countries and the EU's efforts to ensure environmental assessment are promising steps towards sustainable development and environmental protection.

As such this research article yields the following key outcomes and conclusions:

1. There is an urgent need for identification of common challenges faced in carrying out ecological expertise and environmental impact assessment (EIA) in different countries, such as

- Lack of clear criteria for the selection of independent experts
- Inadequate consideration of objections from affected populations
- Discrepancies between the environmental assessment of project documentation and the monitoring of project implementation

2. Researches in the field need to compare approaches and best practices in environmental assessment and EIA processes in different countries, highlighting

- The importance of developing a monitoring program to verify the results and effectiveness of impact assessment.
- The need for ecologists to distinguish personal commitment from professional judgement and advice
- The iterative process of scoping, investigation, analysis of results and feedback to the project to optimize ecological outcomes.

3. At the same time there is a necessity to analyze of cross-country differences in the implementation of ecological assessment and EIA, such as

- Differences in legal requirements for ecological assessment and EIA between countries
- Differences in the level of public participation and consideration of the interests of affected populations
- Variations in the integration of ecological expertise and EIA into project design and implementation, and at the same time, some recom-

mendations for improving the effectiveness and consistency of ecological assessment and EIA processes, including

- Establishing clear criteria for selecting independent experts and ensuring their objectivity.

- Improving public participation and addressing objections from affected populations in a meaningful way- should be proposed.

Collaboration between EIA teams and ecologists to ensure no net loss, and preferably net gain, of biodiversity might be encouraged in a sustainable way.By addressing these key aspects, the research article can contribute to a better understanding of the challenges, approaches and cross-country differences in ecological expertise and EcIA, ultimately leading to more effective and consistent implementation of these processes for sustainable development.

In conclusion, the European Commission uses Impact Assessment in its policies to ensure that all major policy proposals include a sustainability impact assessment covering their potential economic, social, and environmental consequences. This integrated approach helps decision-makers make better-informed decisions and contributes to the overall goal of sustainable development. EIA is a crucial tool for ensuring sustainable development and protecting the environment. (Trofimov Ardelean, Cretu,2015,p.134) However, the challenges faced in conducting EIAs, the differences in EIA processes between countries, and the evolution of EIA effectiveness over time highlight the need for continuous improvement and adaptation of EIA practices to address the diverse ecological, social, and cultural contexts in which they are applied. The future of EIA is uncertain, with some countries shifting their focus away from addressing environmental harm to securing specified environmental outcomes (Rojanschi, Braun, Diaconu, 2000).

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