

STRATEGIC ENVIRONMENTAL ASSESSMENT – UNDERESTIMATED TOOL  
FOR SUSTAINABLE SUBSOIL USE

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**Abstract.** Strategic environmental assessment is an effective tool for improving the level of environmental safety in various areas. The purpose of the article is to identify and classify the main tasks of strategic environmental assessment in subsoil use, taking into account its role and functions in the subsoil management system, and to suggest ways to improve environmental safety in subsoil use by means of strategic environmental assessment. The materials for the article were the results of many years of authors' research on various aspects of the methodology for assessing the environmental safety of subsoil use and scientific source analysis. The main research methods were comparison, deduction, analysis, synthesis, and classification. The authors grouped the tools of the strategic environmental assessment into five main groups: analytical, organisational, scientific and technical, control and procedural, and media. Analysis of the legal framework determines the need to finalise the draft of the Subsoil Code to take into account the requirements of the Law of Ukraine "On Strategic Environmental Assessment" in the context of carrying out state examination and assessment of reserves and resources of minerals and establishing conditions for mineral raw materials, drafting industrial development (technological scheme) of the deposit. The classification of the tools of strategic environmental assessment in subsoil use is carried out. Analysis of draft legislation in the field of subsoil use shows positive

changes in achieving sustainable development goals. Simultaneously, the authors identified some inconsistencies between different legislative acts and projects.

**Keywords:** sustainable development, classification, strategic environmental assessment tools, Subsoil Code of Ukraine.

## 1. Introduction

Research, exploration and especially the exploitation of deposits of minerals cause negative changes in the environment. These negative changes are manifested in the mechanical impact on the surface and subsoil, flooding of territories, introduction of harmful elements and compounds into the components of the geological environment, reduction of biodiversity, etc. (Khorolskyi et al., 2019; Lazaruk, Karabyn, 2020; Malovanyy M., et al., 2019; Popovych et al., 2021; Karabyn et al., 2007). At the same time, mineral and power resources are the basis of industry, a guarantee of the economy and the growth of the industrial world. The conception of steady

development tries to connect such differently directed interests of the state – development of the economy and maintenance of the state of the environment. One of the instruments of steady development there is a strategic ecological assessment (SEA). SEA (Law of Ukraine, 2018) is an effective instrument to increase environmental safety in different spheres, in particular, in the field of subsoil use. Traditional environmental impact assessment (EIA) is insufficient to prevent the degradation of the environment. The EIA is specific to the particular object, and the SEA allows to assess the region-wide picture and forecast economic, social and environmental risks (Pettersson et al., 2015).

This tool is effectively used by powerful world economies. In particular, in 2020, Canada began discussions on a policy decision on coal mining. The published SEA report formed the basis of the government's decision to reduce greenhouse gas emissions and improve the environment. Canada will phase out the use of thermal coal for energy production by 2030. Thanks to this decision, it is planned to reduce carbon emissions by 12.8 million tons in 2030. It will also help the country avoid about 260 premature deaths, 40,000 asthma episodes and 190,000 days of shortness of breath.

The Guidelines for Strategic Environmental Assessment of Soil Pollution in Scotland contain guidelines for assessments when deciding on subsoil use. Both physical impacts on the soil (subsidence, landslides, dips) and chemical and agrochemical (soil contamination, loss of primary soil functions) are determined (SEPA, 2019).

Despite numerous research and practice of applying SEA for subsoil use assessment, in Ukraine, there are several fundamental issues of strategic environmental assessment on the subsoil use: where and how to collect baseline data, risk assessment methodology, methodology for monitoring strategic environment assessment, classification of strategic environmental assessment tools. The issue of strategic environmental assessment tools has become especially relevant now that Ukraine has received the status of a candidate for membership in the European Union.

The *aim* of the article is to identify and classify the main tools of strategic environmental assessment taking into account their role and functions in the subsoil management system and to suggest ways to improve environmental safety in subsoil use of strategic environmental assessment.

*Material and research methods.* The materials for writing the article were the result of many years of the authors' work on various aspects of the

methodology for assessing the environmental safety of subsoil use and analysis of scientific sources. The main research methods were comparison, deduction, analysis, synthesis, and classification. The methods of comparison and analysis were applied in developing the draft of a new Code on Subsoil and other domestic and international regulatory documents. The classification of strategic environmental assessment tools was carried out using a hierarchical method. The method of achieving the result is a feature of tool selection. The methods of deduction and synthesis were used in formulating the conclusions.

## 2. Theoretical part

The SEA makes it possible to coordinate the plans of the mining sector with other national policies, assess the existing institutional capacity, and improve the legislative and technological base of the mining sector in the context of environmental protection, health, and safety, cultural heritage, biodiversity and more. SEA allows you to assess the cumulative effects (often unregulated, unauthorised) of artisanal and small-scale mining. SEA is also a tool for regulating revenue management issues, fair distribution of income from production, as well as promoting the development of education in science (COP, 2019).

In addition to addressing national issues, the SEA can help implement the documents of national policy in regional development planning by:

- assessment of potential positive and negative interactions with other production sectors (livestock, agriculture, fisheries, etc.);
- setting conservation and development priorities;
- regional intersectoral coordination to improve the efficiency of the transport network, rural and urban planning, and efforts to preserve biodiversity;
- consideration of human rights, land use rights and community participation;
- planning of public utilities, where development of new productions is expected (education, health care, water supply) (COP, 2019; Kryvinska, Bickel, 2020; Rauer et al., 2021).

For governments, using SEA leads to better preparedness and strengthening of biodiversity and natural resource management. It ensures the clarity of the tasks to be performed with a defined division of responsibilities between the sectoral partners' various public and private bodies. In addition, it provides a

clear picture of the concerns and aspirations of other stakeholders.

For society, using SEA engages mining activities in regional and national development while minimising the negative consequences of mining. The weakest groups in society and biodiversity receive the extra attention they need.

### 3. Results and Discussion

In 2018, Ukraine adopted the Law of Ukraine "On Strategic Environmental Assessment". However, public authorities do not fully use this tool to achieve

strategic goals. SEA is especially underestimated in the field of subsoil use. At the same time, the draft of the new Subsoil Code and amendments to the relevant mining laws give hope that Ukraine is on the right track. The underestimation of the strategic environmental assessment is caused by the underestimation of the tools that this procedure is endowed with in order to assist in security matters. To improve the understanding of this procedure advantages, the authors combined the SEA tools into five main groups: analytical, organisational, scientific and technical, control and procedural, and media (Fig. 1).

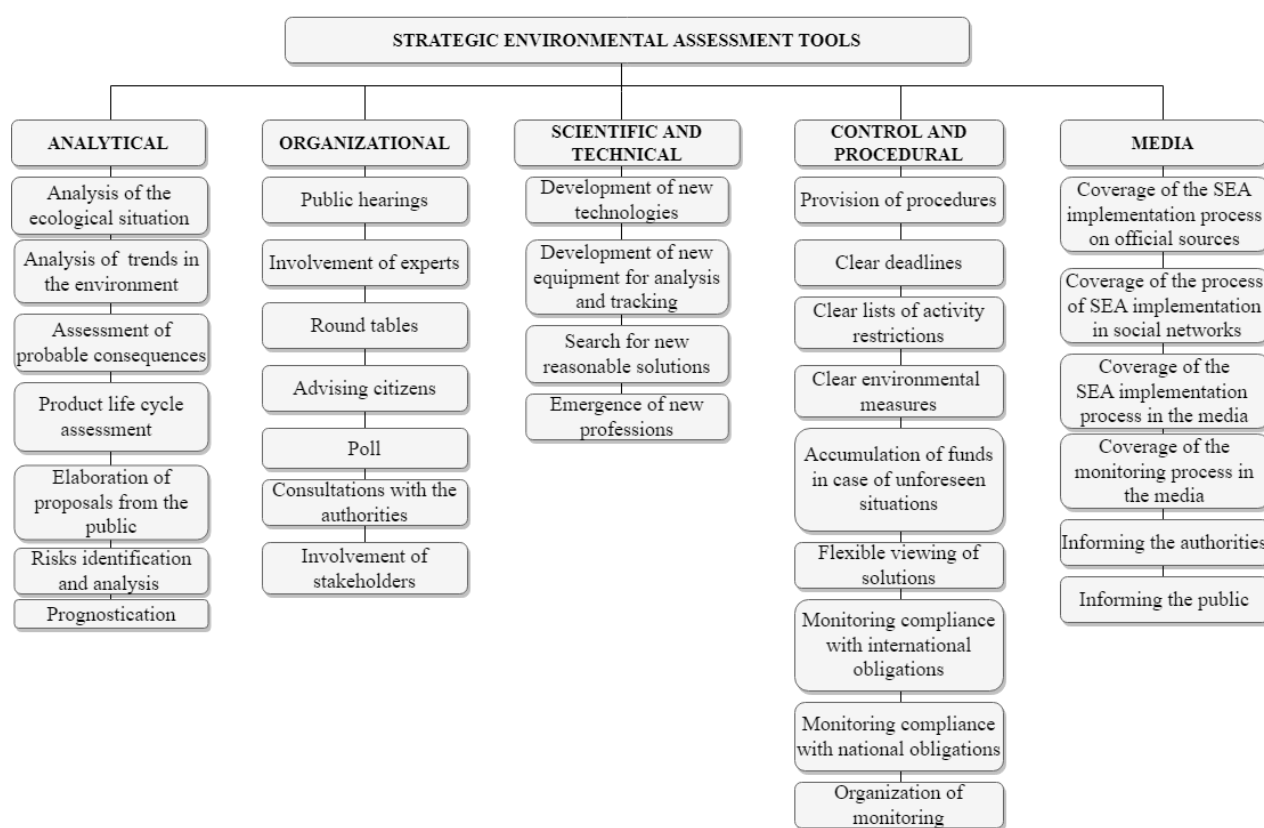


Fig. 1. Classification of strategic environmental assessment tools

The classification of strategic environmental assessment tools, which can be used both in subsoil use and in other areas, is determined by the analysis of the functions and tasks assigned to this procedure, as well as the number and diversity of the subjects of these processes (Environment. People. Law, 2019; EOCD, 2006). The proposed classification is based on the analysis of the strategic environmental assessment procedures of state planning documents of different levels – from national to local, which made it possible to single out 33 elements of activity during strategic environmental assessment and combine them into 5

groups: analytical – carried out by all participants of the procedure independently or through the involvement of specialised centres; organisational – carried out by the customers of this procedure; scientific and technical – carried out involving scientists or experts; control-procedural – carried out by the state authorities authorised to monitor and verify compliance with safety standards; and media which are responsible for the publicity of this procedure and guarantee the involvement of all stakeholders.

The definition of the criteria was also based on the research by the International Council on Mining

and Metals (ICMM) which outlined ten principles that underpin sustainable development in the mining industry and overlap with the SDGs, which mainly include commitments to protect biodiversity, respect for human rights and contribution to sustainable development (ICMM, 2016). According to UNEP's Mineral Resource Management in the Twenty-First Century report, Towards a Sustainable Development Path for Extractive Industries, the extractive sector can affect all 17 SDGs. Extracting minerals from the earth creates opportunities, challenges, and risks for sustainable development and is the foundation of sustainable development. Minerals are essential for human well-being and fundamental to virtually all sectors of the economy. However, mining also poses serious challenges and risks to long-term sustainability. Therefore, a correct and timely assessment of the impact on the environment from surface mining is a guarantee of economic stability and security in this direction of economic development in Ukraine.

The aggravation of the war in Ukraine after February 24, 2022, has increased global consequences, including those for the future multilateral cooperation of countries for the sake of global security, in particular, in the energy and resource market. Faced with the evidence of devastating conflicts in Syria, Yemen, Ethiopia, and now Ukraine, it has become clear that it is essential to understand where the multilateral system is failing and how these problems can be addressed. An element of the solution may be refocusing on the principles and practice of democracy at both the national and international levels (HLAB, 2022). The Sendai Framework for Disaster Risk Reduction 2015-2030 in the economic, social, and environmental spheres through complementary and mutually reinforcing cooperation with the Addis Ababa Program of Action, the United Nations Framework Convention on Climate Change and its Paris Agreement, the Convention on Biological Diversity, the New agenda in cities and other important internationally agreed final documents of the UN can become an effective tool for strengthening environmental security through multilateral cooperation and the use of the latest information technologies for analysis (Environment. People. Law, 2021; Draft Law, 2020).

The war in Ukraine and ongoing global challenges threaten the already fragile economic recovery around the world. Rising global inflation, fueled by higher energy and food prices, as well as persistent disruptions in supply chains and tighter

labour markets in developed countries, are sending waves of concern to developing countries and creating additional challenges for policymakers (United Nation, 2022).

With the plan for the development and implementation of the Ukraine Recovery Plan (Decree of the President of Ukraine, 2022), 23 working groups were created by the Decree of the President of Ukraine No. 266 of April 21, 2022. Unfortunately, none of them is devoted to such an important direction for Ukraine as mineral extraction. This indicates the underestimation of this sector for the sustainable development of Ukraine. Unfortunately, it can be argued that it was the underestimation of the importance of the strategic environmental assessment of this area that did not allow solving the problems of this industry since the beginning of 2014. This is illustrated by the Concept of the State target program for the fair transformation of the coal regions of Ukraine for the period until 2030 (Resolution of the Cabinet of Ministers of Ukraine, 2021), the State-wide Program for the Development of the Mineral and Raw Material Base of Ukraine for the period until 2030 (Law of Ukraine, 2012) and other strategic documents in the field of energy and environmental security of Ukraine. The analysis of these documents allows making a conclusion that the system of public administration in Ukraine does not sufficiently use risk assessment tools, which not only weakens the quality of the developed documents but also makes them ineffective and impractical.

In part, these gaps in the practice of using assessment tools are corrected in the draft of the new Subsoil Code that seeks to introduce several progressive norms alongside those aimed at prioritising subsoil legislation over all other acts. At the same time, there is a danger of creating a monopoly position for the entities already engaged in subsoil mining. There remains the problem of non-coordination of land issues with the subsoil use procedure and environmental assessments; state planning documents in the field of subsoil use, in particular, and those related to land registration do not pass the strategic environmental assessment.

The analysis of the legal framework determines the need to finalize the draft of the Subsoil Code to take into account the requirements of the Law of Ukraine "On Strategic Environmental Assessment" in the context of state examination and assessment of mineral reserves and resources and establishing conditions for mineral resources, drafting industrial development (technological scheme) of the deposit. After all, in

accordance with current regulations, conditions for mineral resources are developed taking into account the rational use of all minerals, as well as their valuable components and are subject to examination by the State Commission of Ukraine on Mineral Resources. They are necessary to determine environmental conditions for the extraction of such minerals.

The procedure for developing conditions for mineral raw materials is established by the central executive body, which ensures the formation of state policy in the field of environmental protection. It declares that during the development of conditions, the dangerous environmental factors that affect or may affect the environment during the development of the deposit, processing of mineral raw materials, and removal or utilisation of industrial waste are identified and assessed. A rational set of measures for nature protection has been developed. That is, we are talking about actions carried out by public authorities outside the law on environmental impact assessment, as fitness training activities do not fall under the Law of Ukraine "On Environmental Impact Assessment". It is not on the list of Art. 3 of the relevant law. However, such activities are subject to the Law on Strategic Environmental Assessment, as it concerns the adoption of a state planning document, namely, the decision to determine the degree of readiness for the industrial development of minerals.

Thus, the actions of public authorities to determine the balance of minerals should be assessed through a strategic environmental assessment, and the actions of economic entities in the extraction of minerals should be assessed through an environmental impact assessment. It is the timely SEA that will be able to guarantee the norm prescribed by Art.50 of the draft, which says: "A special subsoil use permit without competitive procedures is not granted, and the sale of subsoil use rights at the auction or by tender is not carried out if the land plot within which there is a deposit field with promising mineral resources cannot be given to the business entity for the ownership or use from state and communal lands, based on a forest or land easement, or if a preliminary agreement on land purchase has not been concluded with the owner (owners) of land plots, other real estate objects located on it plots, other real estate objects located on it, for public needs".

Areas not covered by the Law of Ukraine "On Environmental Impact Assessment" in the field of subsoil use are covered by the Law of Ukraine "On Strategic Environmental Assessment". The SEA Law provides for an environmental impact assessment,

including public health, during the implementation of state planning documents related to the industry, environmental protection, urban planning or land management (schemes), the realisation of which will involve the activities and facilities for which the legislation provides for the environmental impact assessment procedure. According to the analysis of the legislation in the field of subsoil use, the state adopts several policy documents that precede the transfer of the right to extract to the business entity, in particular, the approval of conditions. Such documents should be clearly defined and agreed upon in accordance with the strategic environmental assessment procedure. Such documents include decisions of the State Committee of Ukraine on the approval of mineral conditions, approval of mineral balances, and decisions on the reservation of areas for subsoil (Kryvinska, Bickel, 2020).

In October 2020, Bill 4187 (Resolution of the Cabinet of Ministers of Ukraine, 2021) was registered. It provides for coordination with the central executive body, which ensures the formation of state policy in the environmental protection of subsoil use in terms of compliance with environmental legislation. However, it is not clear under which procedure such an agreement will take place. If it is a Strategic Environmental Assessment (SEA), the deadline for providing such conditions should be at least 45 days to cover the entire SEA procedure.

The issue of SEA should be regulated separately during the development of land management projects in terms of the reclamation of land damaged as a result of research and industrial development of amber deposits, other minerals of national importance, oil and gas and/or amber extraction. As of today, such working projects can be developed based on the decision of the Verkhovna Rada of the Autonomous Republic of Crimea, the Council of Ministers of the Autonomous Republic of Crimea, the relevant executive body or local government body. According to the Law of Ukraine "On Land Management", such projects must undergo the SEA procedure (Environment. People. Law, 2020). This is confirmed by the fact that information on the subsoil area, for which an electronic auction on the sale of a special subsoil use permit is planned, is displayed on the Interactive Minerals Map and in the e-auction system on the sale of permits.

The issues of allocating land plots for subsoil use also remain somewhat uncoordinated. Based on the fact that the territory is a part of the earth's surface with air space and subsoil located under it within defined limits (borders), which has a certain geographical

location, natural and man-made conditions and resources, and therefore a certain part of the earth, which will become a land plot after its proper registration. However, land managers are deprived of the right to agree on the provision of subsoil use within the territories assigned to them. There may be a situation when the subsoil is provided but the land ploy is not provided. There is no need to divide this procedure into several stages. Here, the procedure of strategic environmental assessment is helpful. During its implementation, it is possible to simultaneously assess land management documents, within which it is planned to issue permits for special subsoil use. Approval of land management projects by local self-government bodies is in fact the approval of industrial subsoil use activities.

Given the above, it is expedient to expand the practice of conducting SEA projects for the development of particular sectors of the economy, including subsoil use, and to plan activities in coordination with Ukraine's commitments to the international community and its citizens. In particular, the decision to close the coal industry by 2035 with the parallel development of other sectors of the economy so that during the relevant reforms, people's living and working conditions become better, not worse.

#### 4. Conclusions

1. Strategic environmental assessment is an effective tool for improving environmental security in various areas, including subsoil use.

2. The proposed classification of tools for strategic environmental assessment in subsoil use contains 33 elements grouped into five groups: analytical, organisational, scientific and technical, control and procedural, and media.

3. Analysis of draft legislation in the field of subsoil use shows some positive changes in terms of achieving sustainable development goals. At the same time, there are several unresolved issues regarding the establishment of conditions for mineral resources. The issue of strategic environmental assessment during the development of land management projects in terms of the reclamation of land damaged as a result of research and industrial development of deposits, as well as the allocation of land for subsoil use, has not been settled.

4. The discussion on the planning of the reconstruction of Ukraine should be based on the principles of sustainable development and the complete analysis of all potential risks, the development of mechanisms for compliance with the

principle of "no one left behind", and the criteria of 'rebuild better than it was'.

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