International Scientific Conference 20 UNITECH 26

INTERNATIONAL SCIENTIFIC CONFERENCE
19-21 November 2026
GABROVO

STRATEGIC ENVIRONMENTAL ASSESSMENT AS A TOOL FOR SUSTAINABLE LOCAL DEVELOPMENT: AN ANALYSIS OF THE ENVIRONMENTAL PROTECTION PROGRAM OF ELENA MUNICIPALITY (2023–2028)

Marieta Stancheva[1], Dragomir Vassilev[1*]

[1]Technical University of Gabrovo, 4 Hadzhi Dimitar Str., 5300 Gabrovo, Bulgaria
**Corresponding author: dragomir.vassilev@gmail.com*

Abstract
The paper examines the role of strategic environmental assessment (SEA) as a key instrument for improving environmental protection mechanisms and promoting sustainable development at the local level. The Environmental Protection Program of Elena Municipality (Bulgaria) for the period 2023–2028 is used as a case study. The study combines analysis of the European and national regulatory framework, review of the program's strategic structure, analysis of official monitoring data on the state of air, waters, soils, biodiversity, waste, noise and radiation, and a SWOT analysis. The results show that the program is organised in four priorities and twelve strategic objectives and that the assessment procedure, including the compatibility check with the Natura 2000 sites, identified no significant negative or cumulative impacts at program level, while shifting detailed assessment to subsequent projects. The main environmental pressures are fine particulate matter from domestic heating, the lack of a wastewater treatment plant in the town of Elena, local groundwater contamination and seasonal tourism pressure on water supply. The analysis also reveals weaknesses in environmental data management and in the integration of environmental policy into other local policies. Recommendations are formulated for using SEA not only as a legal requirement but as a continuous tool for monitoring, public participation and evidence-based municipal planning.

Keywords: strategic environmental assessment, sustainable local development, municipal environmental protection program, Natura 2000, SWOT analysis, Elena Municipality.

INTRODUCTION

Growing anthropogenic pressure on natural systems and the limited availability of natural resources make it necessary to integrate environmental considerations into planning and decision-making from the earliest stages. Sustainable development, understood as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs [9], cannot be achieved only through control of individual projects. It requires that strategic documents – plans and programs – are themselves tested against environmental objectives before they are adopted [6], [7].

Strategic environmental assessment (SEA) is the instrument designed for this purpose. In the European Union it is regulated by Directive 2001/42/EC [1], complemented at project level by Directive 2011/92/EU [2], and in Bulgaria it is transposed through the Environmental Protection Act (EPA) [3] and the Ordinance on the conditions and procedure for environmental assessment of plans and programs [4]. Its importance is particularly evident at the local level, where strategic decisions directly affect the quality of life of the population, the condition of ecosystems and the use of local resources, and where municipalities act as an intermediary

This is an open access article licensed under Creative Commons Attribution 4.0 International
Print ISSN: 1313-230X, Online ISSN: 3033-1404

between national priorities and the needs of local communities.

The aim of this paper is to analyse the role of the environmental assessment procedure as a tool for improving environmental management and promoting sustainable development at the local level, using the Environmental Protection Program (EPP) of Elena Municipality for 2023–2028 [12] as a case study. To achieve this aim, the following tasks are addressed: (i) to outline the theoretical and regulatory basis of SEA; (ii) to analyse the strategic structure of the program and the stages of the assessment procedure; (iii) to assess the state and dynamics of the environmental components in the municipality; and (iv) to formulate conclusions and recommendations for improving the process.

THEORETICAL AND REGULATORY FRAMEWORK

SEA is a systematic process of identifying, analysing and evaluating the likely effects of a plan or program on air, water, soil, biodiversity, human health and the other components of the environment. Its main purpose is to prevent or minimise adverse effects through the selection of more sustainable alternatives and the integration of mitigation measures before the respective activities are implemented [6], [8]. Compared with project-level environmental impact assessment, SEA works upstream, at the level of objectives and priorities, and therefore addresses cumulative effects and the coordination of sectoral policies – energy, transport, agriculture, tourism and waste management.

A distinctive feature of the procedure is the screening of the need for assessment: the competent authority decides whether a plan or program is likely to have significant environmental effects and, consequently, whether a full assessment and environmental report are required. Further key elements are transparency and public participation. The involvement of citizens, non-governmental organisations and institutions helps to identify problems more completely and to formulate solutions that are both effective and socially acceptable [7].

At the strategic level, municipal planning in Bulgaria for 2023–2028 is framed by the UN 2030 Agenda for Sustainable Development [10], the European Green Deal [11] and the National Development Program "Bulgaria 2030", together with sectoral policies on air, water, waste and soils. Under Art. 79(1) and (2) of the EPA, each municipality develops an environmental protection program, which is adopted by the Municipal Council. The mayor is a competent environmental authority under the EPA, while control and coordination of the assessment procedures are exercised by the Ministry of Environment and Water (MOEW) and the Regional Inspectorates of Environment and Water (RIEW). For plans that may affect Natura 2000 sites, the SEA procedure is combined with an appropriate (compatibility) assessment under the Biological Diversity Act and the respective ordinance [5].

STUDY AREA, MATERIALS AND METHODS

Elena Municipality is located in northern Bulgaria, in the North Central planning region and the administrative boundaries of Veliko Tarnovo District. Its mountain-and-valley relief and moderate continental climate favour agriculture, forestry and alternative forms of tourism, but also create risks of erosion and landslides and complicate infrastructure development. The municipality comprises 124 settlements, 26 of which have no permanent population according to the National Statistical Institute – a clear sign of deepening demographic decline. The territory has a rich river network, including the Yovkovtsi reservoir, extensive forests and a high share of protected areas.

The study is based on the EPP of Elena Municipality 2023–2028 with its annex – the Program for Protection, Sustainable Use and Restoration of Soil Functions [12], the documents of the assessment procedure published by the RIEW – Veliko Tarnovo

and the MOEW [13], [14], the Natura 2000 information system [15] and official monitoring data of the National Environmental Monitoring System. The following methods were applied: analysis of normative and strategic documents; comparative analysis; a systems approach to the interrelations between environmental components; analysis and synthesis of statistical data; and SWOT analysis.

RESULTS AND DISCUSSION

A. Strategic structure of the program

The EPP was developed in line with the methodological guidelines approved by the Supreme Expert Council of the MOEW, using strategic planning based on socio-economic, target, problem and SWOT analyses. The general strategic goal is decomposed into four priorities and twelve specific strategic objectives (Table 1). The program is explicitly guided by the principles of sustainable development, prevention and precaution, integration of environmental policy into sectoral policies, subsidiarity, "polluter pays" and "user pays", shared responsibility, access to environmental information and public participation in decision-making.

Table 1. *Priorities and strategic objectives (SO) of the EPP of Elena Municipality 2023–2028*

Priority	Strategic objectives
P1. Restoring natural capital; sustainable communities and ecosystems	SO1 air quality and noise; SO2 water quality; SO3 land and soils; SO4 biodiversity, ecosystem functions and green system
P2. Climate change mitigation and adaptation	SO1 reduction of greenhouse gas emissions in all sectors; SO2 climate-resilient society
P3. Quality of life through improved management of environmental factors	SO1 environmentally sound waste management; SO2 transition to zero pollution; SO3 cleanliness of settlements; SO4 value-creating growth model
P4. Institutional capacity, awareness and public engagement	SO1 institutional capacity of the municipality; SO2 public awareness and engagement

The soil program, prepared in accordance with the National Program for Protection, Sustainable Use and Restoration of Soil Functions (2020–2030), adds four further priorities: administrative capacity and information support; prevention of degradation processes; sustainable land use; and public engagement in soil management. The action plan was coordinated with the Master Spatial Plan of the municipality. The program has an open status and can be updated in line with changes in legislation and in municipal priorities, which makes subsequent monitoring of its implementation essential.

B. The assessment procedure applied to the program

The stages of the procedure under the EPA are summarised in Fig. 1. The screening stage examines the probability of significant effects, the scope of the program and the sensitivity of the affected territory. Scoping defines the key environmental issues and components; the environmental report describes the baseline, the expected effects, the alternatives and the mitigation measures; the consultations ensure transparency; and the decision of the competent authority is binding for the implementation of the program. The final stage – monitoring – provides early detection of problems and corrective action.



Fig. 1. *Stages of the environmental assessment procedure for municipal plans and programs*

For Elena Municipality the procedure was conducted before the RIEW – Veliko Tarnovo [13], [14]. Part of the territory falls within three Natura 2000 sites – BG0000211 "Tvardishka Planina" and BG0000280 "Zlatarishka Reka" (Habitats Directive) and BG0002029 "Kotlenska Planina" (Birds Directive) – as well as protected areas such as the Byala Krava reserve (with an approved management plan), the maintained reserve Haydushki Chukar, the natural landmark Miykovska River Waterfall and the protected sites Glavite, Markov Buk, Belokravishtnitsa, Bukova Gora and Slona [15]. The admissibility check under the compatibility assessment ordinance [5] found the EPP and the soil program admissible, provided that all plans, projects and investment proposals derived from them comply with the designation orders of the protected sites and the management plan of the reserve.

Given the level of detail of the program, no negative effects, including cumulative ones, on natural habitats and species populations, no significant disturbance or fragmentation of biocorridors and no transboundary effects could be identified; for some components positive effects are expected. The effects of individual measures are to be assessed in the subsequent procedures for specific projects. This illustrates the tiering logic of SEA: the strategic level defines the framework and the conditions, while detailed impact assessment is transferred to the project level, where sufficient information is available.

C. State of the environmental components

The analysis of the environmental components forms the baseline against which the program measures are justified. The main findings are summarised in Table 2.

Table 2. *State of the environmental components and main pressures relevant to the assessment*

Component	State and main pressures
Air	Part of the North/Danube assessment zone where the upper assessment threshold for PM is exceeded; indicative measurements in Elena (52 days): 10 exceedances of the PM10 daily limit of 50 µg/m³, no exceedances for SO2, NO2, CO and O3; main source – solid fuel domestic heating
Surface water	Yovkovtsi reservoir – good/excellent status and maximum ecological potential; Veselina River – single exceedances of nitrate nitrogen, dissolved oxygen and total nitrogen in 2022, improving vs. 2021
Groundwater	Karst waters of the Central Balkan; point at Elena – ammonium and nitrite deviations (biogenic pollution), first single exceedances of Fe and Mn in 2022
Wastewater	Combined sewer system in Elena, no urban WWTP; cesspits in villages; water supply network of 298 km with high losses
Soils	Good condition with respect to nutrients; no heavy-metal contamination recorded; erosion risk on slopes
Biodiversity	3 Natura 2000 sites and 9 protected areas; preventive spatial protection of agricultural and forest land in protected sites
Waste	Two-container separate collection in Elena, partially extended to villages; old landfill closed and recultivated; illegal dumps still occur
Noise, radiation	Low noise load, mainly from traffic on road II-53; radiation gamma background within natural levels

Air quality is generally good owing to natural, geographical and meteorological conditions, and there are no large industrial sources. Nevertheless, fine particulate matter shows a pronounced seasonal pattern linked to the burning of solid fuels in households with low chimneys under poor dispersion conditions in winter, which required a program for reducing PM10 levels. The municipality installed its own air-quality monitoring system in 2019, which has not registered pollution. The most significant gap in the water sector is the absence of a wastewater treatment plant: the sewer system of Elena discharges untreated into the river network, which, together with agriculture and unregulated dumps, explains the biogenic pollution of groundwater.

Tourism is both an opportunity and a pressure. The town of Elena hosts about 30 % of the accommodation establishments and 38 % of the bed capacity of the municipality, and more than 80 % of the respondents in a survey rated the development of tourism as good or very good. At the same time, guest houses and private swimming pools increase seasonal water demand, leading to shortages in villages that rely on local sources and to tension between visitors and residents. Such conflicts are exactly the type of cumulative, cross-sectoral effect that strategic assessment is designed to anticipate through carrying-capacity analysis.

D. SWOT synthesis

The SWOT analysis shows that the municipality has a solid basis for sustainable development: administrative capacity, adopted strategic documents, public access to environmental information, partnerships with competent institutions, participation in the national system for separate collection of packaging waste and a positive trend of decreasing landfilled waste. The main weaknesses are the lack of a unified system for collecting and managing data on environmental components, insufficient structuring of the available information, insufficient integration of environmental policy into other local policies and an incomplete separate collection system. Opportunities include EU and national financial instruments (operational programs, the Enterprise for Management of Environmental Protection Activities, the Rural Development Program), cooperation with neighbouring municipalities, renewable energy and energy efficiency. Threats include high waste management costs, migration of qualified staff, deepening socio-economic disparities and climate change.

Environmental activities are financed mainly from the household waste fee, which is sensitive for the population, so the program's implementation depends to a large extent on external funding. In this context, the assessment procedure contributes to a more efficient allocation of resources by prioritising measures with the highest environmental benefit and by providing a documented basis for project applications.

E. Recommendations

Based on the analysis, the following directions are proposed for strengthening the role of SEA at the local level:

- establishing an integrated municipal environmental database with measurable indicators linked to each strategic objective, to support the monitoring stage and annual reporting;
- prioritising the construction of an urban wastewater treatment plant and the rehabilitation of the water supply network;
- measures for reducing PM10 from domestic heating – energy efficiency, replacement of heating appliances and use of cleaner fuels and renewable energy;
- assessing the carrying capacity of the territory for tourism and diversifying tourism spatially and seasonally;
- digital platforms for public participation and inter-municipal cooperation on air quality and waste;
- systematic tiering, so that the conditions of the strategic assessment are effectively applied in project-level procedures.

CONCLUSION

The analysis of the Environmental Protection Program of Elena Municipality for 2023–2028 shows that the municipality has real potential for sustainable development based on the combination of natural resources, administrative capacity and strategic planning. At the same time, the identified weaknesses and threats underline the need for better coordination, efficiency and proactivity in environmental management.

The environmental assessment procedure proves its value through the early identification of potential adverse effects, the formulation of adequate measures and the adaptation of strategic documents to the

principles of sustainable development. It links the strategic vision with the practical implementation of policies and provides an instrument for prevention, control and long-term planning. The sustainable development of Elena Municipality therefore depends directly on the effective use of SEA as a tool of strategic management – through improved procedures and monitoring, stronger institutional capacity and active public participation, so that economic growth, social well-being and environmental protection are pursued as mutually reinforcing goals.

REFERENCES

[1] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment, OJ L 197, 21.7.2001, pp. 30–37.

[2] Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, OJ L 26, 28.1.2012, pp. 1–21.

[3] Environmental Protection Act, State Gazette No. 91/2002, as amended (in Bulgarian).

[4] Ordinance on the conditions and procedure for carrying out environmental assessment of plans and programmes, State Gazette No. 57/2004, as amended (in Bulgarian). Available: https://www.moew.government.bg/bg/naredba-za-usloviyata-i-reda-za-izvurshvane-na-ekologichna-ocenka-na-planove-i-programi/

[5] Ordinance on the conditions and procedure for assessing the compatibility of plans, programmes, projects and investment proposals with the subject and objectives of conservation of protected areas, State Gazette No. 73/2007, as amended (in Bulgarian).

[6] Fischer, T. B., Theory and Practice of Strategic Environmental Assessment: Towards a More Systematic Approach, Earthscan, London, 2007.

[7] Therivel, R., Strategic Environmental Assessment in Action, 2nd ed., Earthscan, London, 2010.

[8] Partidário, M. R., Strategic Environmental Assessment Better Practice Guide – Methodological Guidance for Strategic Thinking in SEA, Portuguese Environment Agency and Redes Energéticas Nacionais, Lisbon, 2012.

[9] World Commission on Environment and Development, Our Common Future, Oxford University Press, Oxford, 1987.

[10] United Nations, Transforming our World: the 2030 Agenda for Sustainable Development, Resolution A/RES/70/1, New York, 2015.

[11] European Commission, The European Green Deal, COM(2019) 640 final, Brussels, 2019.

[12] Elena Municipality, Environmental Protection Program of Elena Municipality 2023–2028 (in Bulgarian). Available: https://obs.elena.bg/documents/програми-и-планове/актуални/

[13] RIEW – Veliko Tarnovo, Decision No. VT-24-EO/2024 concerning the Environmental Protection Program of Elena Municipality (in Bulgarian), 2024. Available: https://www.riosvt.org/wp-content/uploads/2024/08/Решение-ВТ-24-ЕО-2024-2112-Община-Елена.pdf

[14] MOEW, Public register of environmental assessment procedures, entry No. 44763 (in Bulgarian). Available: https://registers.moew.government.bg/eo/lot/44763

[15] MOEW, Natura 2000 in Bulgaria – information system for protected sites. Available: https://natura2000.egov.bg/EsriBg.Natura.Public.Web.App/Home/Natura2000ProtectedSites