



STUDY CASE

KOMARNICA CANYON

THE STRUGGLE FOR PRESERVING
NATURAL HERITAGE AMIDST THE
THREATS OF A HYDROPOWER
PROJECT

SPASIMO KOMARNICU



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ABBREVIATIONS

DPP - Detailed Spatial Plan

EPCG - Electricity Company of Montenegro

EU - European Union

HPP - hydropower plant

IBA - Important Bird Area

IUCN - International Union for Conservation of Nature

KBA - Key Biodiversity Area

MES - Montenegrin Ecologists Society

SEIA - Strategic Environment Impact Assessment

TE - termo power plant

UNESCO - United Nations Educational, Scientific and Cultural Organization

WHC - World Heritage Centre

INTRODUCTION

In the northwest of Montenegro, connecting municipalities of Šavnik and Plužine, lies one of Europe's last untouched canyons – Komarnica Canyon. This area belongs to the high karst zone of Montenegro, where, in the limestone plateau from the Permian and Triassic periods, a series of tectonic and erosional processes have created several magnificent canyon formations. Among them is the deepest canyon in Europe – Tara River Canyon, as well as the lesser-known but equally spectacular Komarnica Canyon.

Since their formation, these canyons have been refuges for a diverse range of life.

As natural mosaics of ecosystems, they provide ideal conditions for life and support an astonishing diversity of species.

At a time when human activities are accelerating the loss of natural habitats, preservation of such cradles of life is more important than ever.

Komarnica Canyon, hidden between the massifs of Durmitor, Vojnik, and the Piva Mountains, is relatively unknown to the wider public. Its distance from main roads and the lack of tourist information contribute to its mystery. Over 700 meters deep, the canyon is accessible only by narrow goat paths, and it is precisely because of this inaccessibility that nature thrives in its untouched beauty.



When standing on the edge of the canyon, beauty and power of nature merge into one: the legs tremble from the height as the eyes are at the level with the eagles, while on the other side, the view drops onto the peaceful villages stretching across the plateaus.

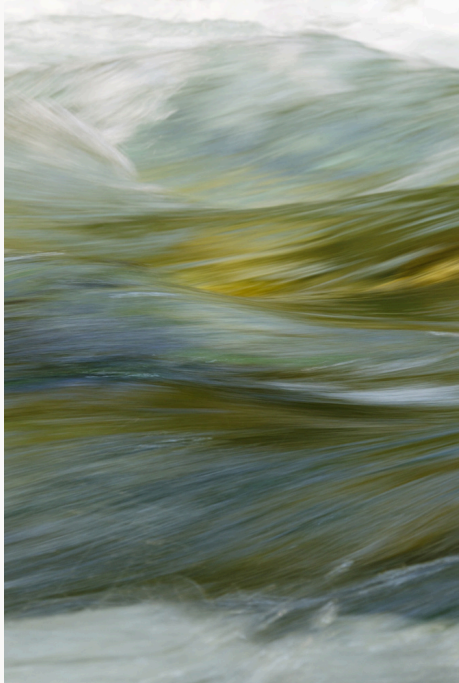
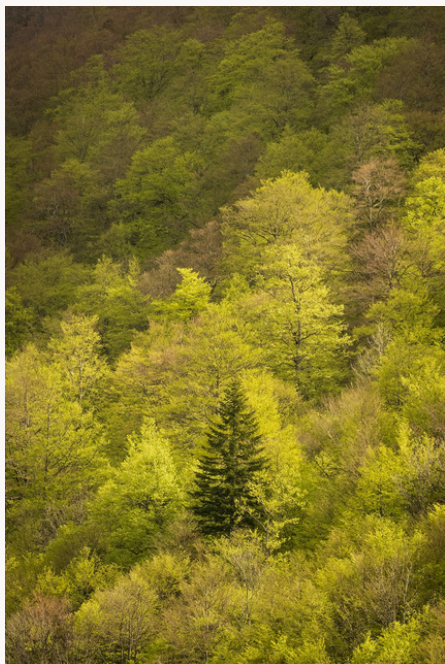
Komarnica is often called "*Tara in miniature*" because, in a smaller area, it offers the same beauty and value as the famous "*Tear of Europe*." Just as the Tara protects Durmitor from the north, Komarnica guards its southern slopes, and together, these three natural treasures form a unique natural whole.

Komarnica springs from the waters of Durmitor, in the habitats of chamois, passes through valleys surrounded by the vertical cliffs of Boljske Grede,

mingles with bears, and babbles through centuries-old beech forests.

From the village of Komarnica, the river enters the most famous canyoneering site in Montenegro – Nevidio. After that, the river carves an ever-widening and deepening part of the canyon, where it joins Pridvorica and becomes the Great Komarnica. This river once ended its course by flowing into the wild Piva, and by merging with Tara, it became Drina. Today, its flow ends in the artificial Piva Reservoir.

Komarnica is much more than a landscape – it is a **reservoir of life**. The collision of mountain and sub-Mediterranean climates creates exceptionally diverse conditions for plant and animal life.



During climatic crises such as ice ages, canyons served as natural refuges, allowing species to survive and repopulate the continent. Some of these species have remained permanently isolated, making Komarnica home to relict and endemic species.



Its inaccessible zones hide untouched beech forests and ancient relict forests of maples and lindens. Limestone cliffs of the canyon conceal labyrinths of caves and pits, whose underground expanses harbor a high level of endemism, and to this day, remain completely unexplored.

Despite all its natural values and varying levels of protection, **Komarnica today faces the threat of a large hydropower plant.** This project would transform the wild river and its canyon into an empty reservoir, erasing its natural beauty, biodiversity, and potential for sustainable ecotourism.

Komarnica, as a symbol of the coexistence of humans and nature, could become a beacon of sustainable development for the entire world or yet another victim of short-sighted "development" plans for devastation.

The Komarnica Hydropower Plant is planned 45 kilometers upstream from the existing Piva Hydropower Plant, with a capacity of 342 MW.

The project includes the construction of a 171-meter-high concrete arch dam and a reservoir 17.6 kilometers long. As a peak power plant, it is expected to produce only 213 GWh of electricity annually, compared to the average 860 GWh produced by the Piva Hydropower Plant, which also operates in peak mode.

It is unclear why Montenegro, which already produces between 40 and 60 percent of its electricity from hydropower, depending on rainfall and snowfall, needs another hydropower plant.¹



The public has not been provided with evidence of the economic viability of the Komarnica project. A system with such a high percentage of energy from hydropower plants is already very vulnerable to climate change, as seen in the large annual fluctuations in production, and desperately requires diversification of renewable energy sources.

The project would flood part of the candidate Emerald site Komarnica and the Dragišnica and Komarnica Nature Regional Park. This area is also part of three potential Natura 2000 sites: the Bukovica Valley and Vojnik Mountain under the Birds Directive, and the Komarnica and Pridvorica sites under the Habitats Directive. Additionally, the Komarnica River has been identified as a potential area for the expansion of Durmitor National Park and a UNESCO site, but so far it has only been given the lesser status of a "regional nature park."

Komarnica Canyon is home to numerous protected species. However, the full extent of the damage the project could cause is still unknown, as field research on wildlife has been conducted only at a few of the most accessible sites. The unique caves and cliffs, which harbor the highest degree of endemism, would be submerged before their biodiversity value could be fully explored.

Environmental impact assessment for the project, published in February 2022, resembles more of a promotional brochure than a scientifically grounded

study, making it susceptible to legal challenges.¹

Montenegro is obligated to protect its Emerald candidate sites under the Bern Convention and must carry out an "appropriate assessment" for any project that could significantly affect an Emerald or Natura 2000 area.

If it is determined that the impact would be significant, the project cannot proceed unless a special assessment confirms that it is a project of "overriding public interest." However, the environmental impact assessment for Komarnica does not include the "appropriate assessment."¹

Similarly, projects that would degrade the status of a river are not allowed under the EU Water Framework Directive unless they receive an exemption under Article 4(7) of the Directive. Again, a detailed assessment is required, which, in the case of Komarnica, has not been conducted.¹

This publication summarises scientific assessments, presenting the values and beauty of the Komarnica Canyon for both nature and people, while also discussing its significance for Montenegro and Europe, as well as the importance of its protection.

In the following pages, through the eyes of nature and generations connected to it, we discover why Komarnica is more than just a river – it is a legacy that belongs to all of us and must be preserved for future generations.

CHAPTER I

CASE OF KOMARNICA CANYON

OUTDATED PLANS FOR THE CONSTRUCTION OF A HYDROPOWER PLANT THREATEN THE DISAPPEARANCE OF ONE OF THE MOST VALUABLE NATURAL AREAS IN MONTENEGRO, THE BALKANS, AND EUROPE.

The plan for the construction of the Komarnica Hydropower Plant, dating back to the 1970s,² is now considered outdated and incompatible with modern principles of nature conservation and sustainable development. Nevertheless, this project is proposed to be implemented in the heart of one of Montenegro's most valuable natural areas. Komarnica Canyon, known as a "biodiversity hotspot," enjoys multiple layers of protection at both the national and international levels, and its preservation is crucial for the natural heritage of the Balkans and Europe.

This chapter provides an overview of the project's history, an analysis of the procedures carried out by the client and decision-makers, and highlights numerous examples of serious violations of domestic laws, the Constitution of Montenegro, as well as international agreements and European Union directives. Additionally, to illustrate the exceptional significance of the Komarnica Canyon, we will present in detail the levels of its protection, as well as its recognition and invaluable importance in the context of nature and environmental conservation, both in Montenegro and across Europe.



KOMARNICA CANYON AS A PROTECTED AREA

At the national level, the Komarnica Canyon holds multiple protection statuses:

- “Dragišnica and Komarnica” Nature Park – IUCN Category V (national code: MNE042011201765).
- Natural Monument “Komarnica River Canyon” – Protected since 1969, along with the Piva River Canyon, under Category III of protected areas according to national standards and IUCN classification.

At the international level, the Komarnica Canyon and its river are recognised as:

- A candidate Emerald site (ME000000P) under the Bern Convention,³
- A Key Biodiversity Area (KBA),
- An Internationally Important Bird Area (IBA), and
- A potential Natura 2000 site.⁴

Since 2018, the UNESCO/IUCN mission has recommended granting Komarnica Canyon national park status. This proposal is based not only on the canyon's exceptional natural value but also on its potential to be integrated into the UNESCO-designated natural area of Durmitor National Park. Such an expansion would create a unified entity of global significance, comprising Durmitor with the Tara Canyon and the Komarnica Canyon. Including Komarnica Canyon within Durmitor National Park would significantly enhance the ecological and conservation integrity of both locations.

Although Komarnica enjoys these protection statuses, the area remains insufficiently researched. Most of the available data originates from the previous century and serves as the basis for environmental impact assessments of the planned hydropower plant. For this reason, scientists, primarily from the European Union, have joined the "Save Komarnica" initiative to contribute to research and shed light on the biodiversity values of this canyon.

The first scientific expedition, organized by the European Biodiversity Survey group, provided clear evidence of the canyon's importance for nature conservation at the European level in just eight days,⁵ despite unfavorable weather conditions. This is only the beginning of research efforts, as new expeditions are planned, reflecting the great interest of the scientific community in this unique area.

The initiative has also attracted experts from other fields (energy, economics, law, tourism, agriculture, and sustainable development), as well as artists, activists, and nature lovers, all contributing in their own way to the preservation of this valuable area.

THE KOMARNICA HYDROELECTRIC PROJECT NEARLY A CENTURY OLD

The idea of constructing the Komarnica Hydroelectric Power Plant in its current form first emerged in 1972, although a project for the construction of a different Komarnica Hydroelectric Power Plant was approved as early as 1956, with the aim of diverting its water to the Perućica Hydroelectric Power Plant and forming the Komarnica – Perućica hydroenergy system. The project in its current form was designed as a conceptual solution within a study by Elektroprojekt Ljubljana from 1988.⁶

In 2012, the Government of Montenegro adopted the Draft Detailed Plan for the multipurpose reservoir⁷ as part of the Energy Development Strategy of Montenegro until 2025,⁸ thus initiating preparatory work. However, the project was halted in 2013 due to identified potential geological issues.

After that, in 2015, memorandum of cooperation was signed with the Chinese company Norinco International, as well as with the governments of Slovenia and Turkey. Despite these agreements, the financing for the project has not been secured to this day.

According to the Energy Development Strategy of the Republic of Montenegro until 2025 from 2007, a "moderate construction" scenario for hydro potential is envisioned, within which the construction of the Komarnica Hydroelectric Power Plant is planned. This strategic vision was further emphasized in the updated 2014 strategy, titled the Energy Development Strategy of Montenegro until 2030,⁹ which highlights the energy sector as one of the main drivers of the country's overall development – from economic, social, and ecological perspectives.



One of the key recommendations of this document is precisely the construction of the Komarnica HPP.

The plan for the construction of the Komarnica HPP was included in the Water Management Framework of the Republic of Montenegro from 2001,¹⁰ as well as in the Montenegro Water Management Strategy from 2017,¹¹ further confirming its presence in key national development and management documents.

PROCEDURES OF THE MONTENEGRIN AUTHORITIES TOWARDS THE IMPLEMENTATION OF THE KOMARNICA HPP PROJECT.

- **Approval of the Strategic Environmental Impact Assessment (SEIA):** In May 2020, the Report on the Strategic Environmental Impact Assessment¹² for the detailed spatial plan of the multipurpose reservoir area on the Komarnica River was adopted.
- **Detailed Spatial Plan (DPP Komarnica):** In May 2020, the Detailed Spatial Plan (DPP Komarnica)¹³ was also approved, with an amendment adopted in June of the same year.
- **Granting the concession to Elektroprivreda Crne Gore (EPCG):** In February 2022, EPCG was appointed as the concessionaire for the planned 172 MW HPP plant on the Komarnica River. EPCG, the state-owned electric power company, is currently developing the construction project.
- **Concession Award Plan and Procedure:** On July 9, 2020, the Government of Montenegro adopted the Concession Award Plan,¹⁴ based on which a draft concession agreement was prepared. The Ministry of Economy conducted a public discussion on this draft from July 31 to August 14, 2020. At the initiative of non-governmental organizations, the discussion was extended until August 21, 2020.
- On August 27, 2020, the Government adopted the final text of the concession agreement and the draft contract (decision no. 07-4078). The concession agreement, in accordance with Article 20, Paragraph 2, Item 6 of the Concession Law,¹⁵ stipulates that the concession be awarded directly to EPCG, without the publication of a public notice, as EPCG is a company in which the state of Montenegro holds a majority ownership and independently appoints all members of the governing bodies.
- **The Unified List of Priority Infrastructure Projects:** At its 61st session held on December 12, 2024, the Government of Montenegro adopted the Unified List of Priority Infrastructure Projects for the energy sector.¹⁶
- Energy production is the sector allocated the largest portion of funds – nearly half of the total budget of 1.38 billion euros, or 665 million euros. These funds are distributed across six projects: two hydropower plants (Komarnica and Kruševo), two solar power plants (Slano and Krupac), the installation of an additional unit at the Perućica Hydroelectric Power Plant, and the continuation of the Solari project, which involves the installation of solar panels on household roofs.
- In the meantime, there has been a significant **increase in the construction costs of the Komarnica HPP**. The initial estimate was 246 million euros, but it was later revised to 260–290 million euros. Currently, the costs have been further increased by 10–15%, bringing the total figure to 315 million euros. This increase further highlights the financial risk of the project, particularly in light of the growing ecological and social challenges associated with its implementation, as well as challenges related to climate change. However, according to estimates by the International Renewable Energy Agency (IRENA), the total value of the investment could reach nearly **480 million euros** (more in Chapter III).

ASSESSMENT OF THE ENVIRONMENTAL IMPACT OF THE KOMARNICA HYDROELECTRIC POWER PLANT

The environmental impact assessment procedure for the construction of the Komarnica HPP was conducted in accordance with the Law on Environmental Impact Assessment and relevant Regulations. After the impact assessment report was prepared, the document was sent to the Environmental Protection Agency for further evaluation. The preparation of the report was entrusted to the company Energoprojekt – Hidroinženjering from Belgrade.

In March 2022, Environmental Protection Agency organised two public discussions, held in Plužine and Šavnik. Non-governmental organisations, aiming to broaden public participation, requested Environmental Protection Agency to organise a central public discussion in Podgorica, but this did not happen. This failure to organise additional discussions for the broader public significantly limited the opportunity for citizens and relevant stakeholders to be involved in decision-making about the project. Nevertheless, non-governmental organisations held a large public debate in Podgorica during this period to inform the public.

After the public discussions, Environmental Protection Agency formed an expert commission to assess the report, in accordance with the Regulation on the Content of the Environmental Impact Assessment Report. The commission identified numerous deficiencies in the report, issuing 87 comments on its quality and the lack of relevant data. The Director of the Agency, Milan Gazdić, stated on July 18, 2022, that the Commission had ordered detailed research of the area to ensure concrete data on the value of the area and potential losses due to the construction of the hydropower plant.

The Commission for the assessment of the report finalised its report in May 2022, setting a deadline of 855 days for submitting the updated version of the report. However, in September 2024, when Montenegrin public expected information on this version, they were informed that the deadline for the response would expire at the end of February 2025.

This delay of nearly five months raises doubts about the transparency and potential manipulation of the process and can be interpreted as a way to buy time. Once the project holder submits the updated report, the Commission will continue its evaluation, and it is expected that the process will be completed by the summer of 2025. After that, the updated version of the document will be made available to the public. These delays and uncertainties regarding the evaluation procedure raise concerns about the seriousness, transparency, and thoroughness of the process itself.

PROBLEMS RELATED TO THE PUBLIC DISCUSSION AND ACCESS TO INFORMATION ABOUT THE KOMARNICA HPP PROJECT

The public discussion on the Draft Spatial Plan of Montenegro until 2040 and the Report on the Strategic Environmental Impact Assessment was organised by the Ministry of Spatial Planning, Urbanism, and State Property from January 29 to April 29, 2024. Through active participation in this discussion, Montenegrin Ecologists Society (MES), "Save Komarnica" initiative, numerous non-governmental organisations, interested citizens, and independent experts submitted suggestions and comments, particularly regarding the exclusion of the Komarnica HPP construction plans from this key state document.

However, despite the intense public debate, Ministry and planners did not respond to the submitted comments and recommendations, which has left the process closed to further public scrutiny and transparency. The plan has not yet been officially adopted, and the question remains how the arguments presented so far will be considered.

Throughout 2024, MES submitted several requests for access to information, including:

- Requesting the final concession agreement, along with progress on the contract's provisions.
- Seeking clarification regarding the Report of the Commission for Evaluating the Impact Assessment of the Komarnica HPP on the environment.

In response, only the draft concession agreement from 2022 was provided, which had not been signed.

When MES made a request to the Environmental Protection Agency for details on the Commission's reports and information regarding the date the report was sent to the contractor, the Agency responded that they did not possess the requested information and denied the request. In response, MES filed an appeal, which is currently under consideration.

This process demonstrates a lack of transparency and a blockage in access to information, further complicating the wider society's ability to be informed about the true extent of the ecological and social risks associated with the construction of the Komarnica hydropower plant and to actively participate in asserting their rights.

VIOLATION OF THE BERN CONVENTION

Montenegro has violated Article 3 and Article 4, paragraphs 1, 2, and 3 of the Bern Convention, as well as Recommendation No. 157 (2011) of the Standing Committee, by adopting a series of documents that plan the construction of the Komarnica HPP with an installed capacity of 172 MW. **The dam, which would be 171 meters high and have a reservoir stretching 17.6 kilometers**, would have significant negative impacts on protected habitats and species in the Komarnica candidate Emerald site (ME000000P). Additionally, an *appropriate assessment* in accordance with Articles 45-52 of the Montenegro Nature Protection Law has not been carried out.

More than half of the Komarnica River in this area would be submerged, while two of the wildest canyons in Montenegro (Komarnica and Pridvorica) and many caves would be transformed into an artificial reservoir, leading to the irreversible destruction of the most important ecological features and the integrity of the site.

Emerald areas in Montenegro do not have legal protection, and their status and boundaries have not been updated based on new data collected during the process of establishing the Natura 2000 network in the country. Therefore, outdated data from 30 years ago, which describes the characteristics of the area in question, are still being used for environmental impact assessments.

For all the reasons mentioned, MES, together with partner organisations Society of Young Ecologists Nikšić and the Organisation KOD, has filed a complaint to the **Secretariat of the Bern Convention**¹⁷ regarding the decision of the Government of Montenegro to grant a concession to Electric Power Industry of Montenegro (EPCG) for the use of natural resources, for the construction, operation, and maintenance of the Komarnica HPP, for the production of electricity.

From several responses from the Secretariat of the Bern Convention, we have learned that the **bureau has reiterated its concern about the fact that this hydroelectric power plant, along with several others nearby, is included in the National Energy Development Strategy and other plans, despite the clear call from the European Parliament for Montenegro to reduce its reliance on hydroelectric plants vulnerable to climate change, as well as concerns expressed by the UNESCO World Heritage Centre (WHC).** It was emphasised that long-term strategies should remain open to possible re-evaluation throughout their duration.

These concerns highlight the need for careful consideration of the impacts of hydroelectric projects on the environment, as well as on natural and cultural heritage, and the importance of aligning national strategies with international recommendations and obligations.

The Bureau reiterated its previous request to the Government of Montenegro to respond to the claim made by the complainant that the data used for the Environmental Impact Assessment Report of the Komarnica Hydroelectric Plant is about 30 years old, and once again requested that the Government provide the relevant Report.

The Bureau was also informed that the UNESCO World Heritage Centre received information from MES, which was forwarded to the national authorities with a request for comments and additional information, but the response has not yet been received.

The Bureau also took note of the complainant's request for this case to be reconsidered at every upcoming Bureau meeting and for the possibility of elevating the case to a "possible file" status. In several communications, the Bureau concluded that the opening of the case will be carefully reviewed once the updated Report is finalised and submitted.

Therefore, the status of the complaint is currently "pending."



UNESCO'S CONCERN ABOUT THE PLANS FOR THE CONSTRUCTION OF THE KOMARNICA HYDROELECTRIC PLANT

Construction of the Komarnica HPP raises significant concern due to its potential impact on the "Dragišnica and Komarnica" Nature Park, which, according to the UNESCO and IUCN mission of 2018, could be a "potentially appropriate extension" of the World Heritage status of the Durmitor National Park, thus enhancing its integrity. The northern part of the potential Specially Protected Area (SPA), including the Bukovica Valley and Mount Vojnik (in accordance with the EU Birds Directive), would also be affected by this project.

The procedure for issuing an environmental permit is ongoing, but to date, there have been no official consultations with the Bern Convention or UNESCO regarding the potential impact of the project on this protected site.

A letter from the UNESCO World Heritage Centre, dated July 15, 2022, expresses concern about the potential impacts of the proposed Komarnica HPP on the "Dragišnica and Komarnica" Nature Park. In Montenegro's response on December 1, 2022, it was stated that the Environmental Impact Assessment (EIA) for the project is still ongoing and that the concessionaire will be required to carry out an impact assessment in accordance with the Bern Convention's requirements before construction begins.

On March 14, 2023, Montenegro submitted the Revised Protection and Management Plan (RPS) for Durmitor National Park for review by the IUCN.

UNESCO recommends¹⁸ that Montenegro ensures the potential impacts of this project on the Outstanding Universal Value (OUV) of Durmitor are fully assessed and that the project is not approved if the impact assessment results show that the construction of the HPP could negatively affect the OUV. It is particularly emphasized that the construction of the dam would flood the "Dragišnica and Komarnica" Nature Park, which could be an important addition to the expansion of the World Heritage site. The 2018 mission considered this area to be geologically and biologically significant and complementary to the Durmitor area, suggesting it could play a key role in strengthening the integrity of the World Heritage site.

UNESCO stresses that the decision on the project must take into account not only the current integrity of the site but also the potential implications for future expansion of the site, ensuring that any project does not undermine the high standard of protection required by this site.

CHAPTER II

NATURAL VALUES OF KOMARNICA CANYON

TKomarnica Canyon represents one of the **most important biodiversity hotspots in Montenegro**. As a mosaic of ecosystems, it is home to over 20 different, well-preserved habitats, supporting a diverse range of wildlife. Some of these habitats are so rare that their **protection is a priority at the European Union level**.

"River canyons are exceptionally complex mosaics of micro-ecosystems on steep slopes, with a high diversity of ecological factors and a significant degree of isolation for individuals, populations, species, and communities. This results in the creation of narrowly distributed (endemic) biological systems. Canyons provide an opportunity for individuals and populations to quickly move from one ecosystem to another within a very small area, which represents a large ecological mosaic. This allows them to survive extremely unfavourable conditions by adapting to changes in climatic factors.

In the ecological mosaic of canyon ecosystems, there is the possibility of existence for both thermophilic and cold-loving species,¹⁹ making canyons like Komarnica incomparably the richest centers of endemic and relict populations, species, and communities." - emphasize professors Radomir Lakušić and Sulejman Redžić, in their 1989 paper,²⁰ based on their own research as well as the earlier work of the renowned Montenegrin and Balkan botanist Vilotije Blečić, whose house was located near Komarnica.



Blečić's, and later Lakušić's and Redžić's works describing Komarnica are filled with words such as "**magnificent**" and "**jewels of nature**," repeatedly emphasizing the value and richness of species and plant communities that have survived to this day thanks to the canyons.

Such areas are now called "*hotspots of biodiversity*" because they are rich in endemic, rare, endangered, and relict species. In the Komarnica canyon, various rare and unique species still live, some of which have been here since before the Ice Age, including species that no longer exist anywhere else in the world. One such species is the Piva bellflower, which still survives in Komarnica, having lost its habitat in the Piva canyon when it was submerged.



The mere view of the Komarnica canyon presents a picture of a unique wild area, where one can simultaneously see tall pines rising from the stone and dense, rich forests of linden and maple covering the canyon terraces, the deep blue color of the river, and the steep cliffs covered with rare species growing on the rocks. Otters, wild goats, griffon vultures, as well as dozens of other species of mammals, birds, amphibians, reptiles, and hundreds of insects and other invertebrates find refuge in the Komarnica canyon.

FLORA AND VEGETATION

*"Canyons are not merely geomorphological phenomena but very specific geo-biological communities where physical, chemical, and biological systems have been uniquely integrated through the long evolution of life from the rise of the Dinarides to the present day. The plant communities of the canyons, composed of endemic biological systems from periods before, during, and after the ice ages, are **the most precious living documents of the evolution of life and should be given special attention in the organisation of nature conservation,**"* wrote Radomir Lakušić, one of the greatest Balkan botanists, back in 1972.

Komarnica Canyon is characterised by a rich plant life, including exceptional floristic diversity and a complex vegetation structure. Despite the absence of systematic botanical research, **Komarnica Canyon is recognised as one of the most significant centers for the preservation and development of native flora and vegetation, as well as a key area for the diversity of endemic and relict flora in Montenegro.** The diverse habitats, shaped by various ecological conditions, have facilitated the development of rich flora across the broader Komarnica Canyon area. This region combines influences of both Mediterranean and high-mountain climates, resulting in the remarkable phenomenon of Mediterranean species (e.g., *Salvia officinalis* - sage) coexisting with true high-mountain elements (e.g., *Leontopodium alpinum* - edelweiss) within a short distance.²¹

In comparison to the overall flora of

Durmitor, which includes over 1,600 species, flora of the Komarnica area represents one of the exceptionally rich parts of the Durmitor massif and is no different from the areas that were incorporated into the Durmitor National Park in 1952!²²

"The Komarnica Canyon has been shaped by nature over a long history spanning approximately 30 million years. Together with light, warmth, and wind, the Komarnica has also molded the living systems of the canyon, imprinting them with its unique signature. **The percentage of endemic species or populations within the canyon's rocky crevices reaches up to 50%, which is the most significant confirmation of the relict²³ and refugial²⁴ character of these ecological systems.**"²⁰

These endemic and rare species will be lost if the Komarnica hydropower plant is built, as the majority of rocky habitats would be completely destroyed. Even habitats not directly affected by water accumulation would suffer significant changes in microclimate, disrupting living and ecological conditions.

Of the 88 habitat types listed as significant for conservation at the European Union level, known as Natura 2000 habitats, as many as 22, or one-quarter of them, have been recorded in Komarnica.

The large number of vascular plant species clearly indicates that the Komarnica Canyon is **one of the most significant centers of biodiversity in Montenegro.**

Although systematic studies of biodiversity categories have not been conducted, Komarnica Canyon has so far recorded: 97 bird species, at least 41 mammal species, 22 species of amphibians and reptiles, and 126 out of Montenegro's 195 species of butterflies (while the diversity of nocturnal butterflies is believed to be much greater but remains unexplored!).²⁵

According to experts, Komarnica Canyon has enormous speleological potential, boasting numerous caves and pits with significant morphological diversity and biological richness. **These subterranean habitats, teeming with endemic animals, are also entirely unexamined!**

Komarnica Canyon serves as a crucial corridor and safe haven for large mammals naturally moving from Durmitor, through Komarnica, toward Vojnik. This area is one of the most important habitats and feeding grounds for brown bears, as well as an exceptional habitat for chamois populations.²⁶

Komarnica River, carving a narrow canyon valley that reaches depths of over 700 meters in some places, is characterized by crystal-clear waters, emerald-green springs, and pools framed by steep cliffs, forested slopes, and meadow greenery. These represent true natural rarities and extraordinarily attractive landscapes.

"For the fauna of the riverbed, the Komarnica Canyon, like other canyons in the Emerald Network, is an important refugial area. In the Komarnica River, 50 taxa of macroinvertebrates have been recorded—all of which are highly sensitive to changes in substrate type and altered hydrological conditions.²⁷

The brown trout (*Salmo trutta*) is the dominant species in these waters and has been exceptionally abundant at all surveyed locations. The populations are in excellent condition, with a normal structure across all age classes. **Considering that the brown trout has become endangered in almost all Black Sea basin rivers, such a state represents a truly positive surprise.** Brown trout inhabits fast-flowing, clear, oxygen-rich mountain waters with gravelly or sandy bottoms, not artificial reservoirs.

The grayling (*Thymallus thymallus*) also lives in the Komarnica Canyon, with a thriving population and a positive growth trend. Among fly-fishing enthusiasts, the grayling is the top target species.²⁸

GENETIC TREASURE

Komarnica River belongs to the Black Sea basin, unlike most of Montenegrin rivers, which end their course by flowing into the Adriatic Sea.

This means that Komarnica and Piva are very likely home to unique, ancient meta-populations of animals whose life cycles are tied to the river ecosystem and are genetically isolated from organisms in our other rivers. After the Piva Canyon was submerged, individuals from these populations may have found refuge upstream in the Komarnica Canyon!

Comprehensive genetic studies of these meta-populations are necessary to shed light on the significance of the Komarnica Canyon, particularly in terms of preserving rare, ancient genetic material.



KOMARNICA – A TREASURE TROVE AND CRADLE OF LIFE

Otter, chamois, golden eagle, as well as hundreds of other species of mammals, birds, amphibians, reptiles, fungi, insects, and other invertebrates find their refuge in the Komarnica Canyon. In this secluded, untouched area, they can rest while humans recklessly exploit accessible forests, rivers, and meadows of our country.

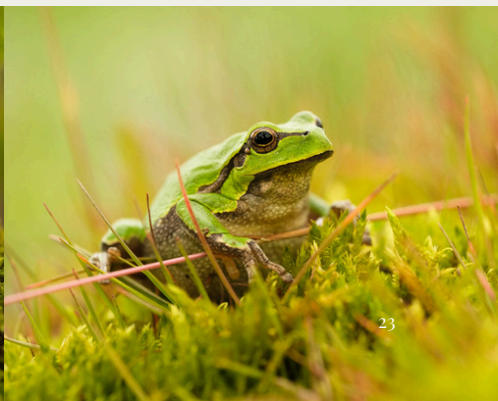
Just a glance at the Komarnica Canyon reveals a picture of a unique wild area, where tall pines sprouting from rocks capture our attention, along with dense, rich relict forests of linden and maple, pristine beech forests covering the canyon terraces, and the distant, untamed deep blue river nestled between sheer cliffs adorned with rare species growing on the rocks.

In Komarnica, life found shelter during unfavourable conditions and later spread back into the surrounding areas once the crises passed.

An area's health is reflected in the balance of its forests, rivers, and meadows, and their health is measured by the diversity of animal and plant species that have shaped these systems for millions of years and still depend on them. Numerous species that live in Komarnica will not be able to escape this canyon and start life anew elsewhere if flooding occurs.

All of this is just a fragment of the true nature of Komarnica, which, truthfully, we still know very little about, as this vast expanse remains largely unexplored even today. Despite this lack of research, the little we do know about Komarnica has been enough for the canyon to be declared protected both locally and at the European level!

Most data on Komarnica was collected decades ago, and even then, the studies recognised the high value of this canyon. On the other hand, **numerous European canyons were flooded in the past, making the canyons of Komarnica, Tara, and Morača invaluable treasures for all of Europe — and the world!**



CHAPTER III

ECONOMIC AND ENERGY ASPECTS OF THE KOMARNICA CASE²⁹

Komarnica hydropower plant project was first conceived at the conceptual level in the Elektroprojekt Ljubljana study back in 1988. Over the years, Montenegro developed a technical solution for utilizing the hydro potential of the Komarnica River, which envisions the construction of a large hydroelectric plant with a total installed capacity of 172 MW and an expected annual production of 213 GWh.

A study and analysis of the feasibility of this potential project, conducted from July to November 2024 by several Montenegrin experts from various fields, unequivocally showed that the construction of the Komarnica hydroelectric plant would be **very costly, with extremely demanding and complex construction requirements, particularly with a long timeline. Moreover, by the time the plant becomes operational, it would provide only a minimal annual production, just slightly above 1% of the total production in Montenegro**, considering the production capacity planned to be installed by 2030, which will entirely come from renewable sources (wind farms, solar power plants, hybrid plants, concentrated solar power plants, as well as increasing the production capacity of existing hydro potentials and hydroelectric plants).



THE ESTIMATED COSTS FOR THE HPP KOMARNICA CONSTRUCTION

Estimated total construction costs have been approximately, according to the years in which the estimates were made, starting from the initial 183 million euros - Option 1 in the 2017 projection. Then, in the primary concession agreement from 2020, this cost was already estimated to range between 260 and 290 million euros. By 2022, during the period of aligning the concession agreement, a public report stated that the project would cost 290 million euros. Finally, Elektroprivreda Crne Gore, in its 2023 Business Report, states in the section describing the plans for further development that the total estimated value of the HPP Komarnica construction project is 344 million euros, including the costs for detailed geological studies required for the Main Project (which should certainly be included in the total investment value, along with supervision costs and unforeseen expenses). The expected construction period for the HPP Komarnica, according to this report, is seven years, and the activities on the project are planned to begin after the adoption of the detailed spatial plan and the completion of the financing negotiations.

According to the International Renewable Energy Agency (IRENA), for the Komarnica Hydropower Plant, taking into account the availability of land, lack of transportation and other supporting infrastructure, the size of the reservoir, and the authors who have

precisely analysed the costs of building large hydropower plants, it is considered highly difficult to achieve an investment cost below 3,000 USD per installed kilowatt (2,776 EUR per kilowatt). Therefore, **the total value of the investment could potentially reach nearly 480 million euros.**

RISKS

In addition to being an extremely expensive and financially demanding project in terms of financing, and also highly complex in terms of construction, Komarnica HPP project presents **significant risks**. Most of the natural risk factors have been clearly and precisely described in the Environmental Impact Assessment Study, which was submitted to the competent Environmental Protection Agency, with the final opinion expected in February 2025.

Among the numerous risk factors, it is important to highlight: the destruction of natural habitats, a clear negative impact on flora and fauna, with possible long-term consequences on biodiversity; destruction of the natural environment due to changes in topography and landscape; flooding of land and loss of property; loss of tourism potential; as well as seismic risks, risks related to geological stability and increased potential for landslides, hydrogeological risks, and potential hydrological losses, risks arising from climate change, and risks related to altered hydrology.

In addition to natural risks, there are **numerous economic and social risk factors** associated with the realisation of such large projects, including risky financial arrangements for the implementation; high capital costs and significant initial expenses. The construction of a HPP, such as Komarnica HPP, would require enormous investments in the infrastructure. In addition to building the plant itself, additional infrastructure projects would be needed, such as roads, power lines, bridges, and embankments. These projects could result in a significant fiscal burden, especially in a country like Montenegro, which faces financial challenges and limited budgetary resources.

One potentially catastrophic scenario would be if the project were to be halted midway, when other technologies, more advanced than today's, would be managing the energy market. Construction of cheaper energy alternatives in the near future with improved technology could also make the Komarnica HPP highly uneconomical and financially unviable.

For some time now, large hydropower projects, in light of climate change and uncertain hydrological predictions for the future, have been abandoned worldwide over the past 10 years. It is completely inaccurate to claim that hydropower plants have continuous production throughout the year, as, in addition to the regular annual maintenance periods of about 30 to 45 days, they often experience



reduced or nearly zero production during extreme weather conditions or insufficient water flow.

ALTERNATIVE OPTIONS

There are numerous alternative options and solutions that could ensure long-term energy independence for Montenegro, which would also enable the shutdown of the Pljevlja thermal power plant, thus facilitating a just societal transition in the thermal power plant - mine system in Pljevlja.

Montenegro and its national energy company should focus on developing hybrid power plant projects, instead of the extremely complex, costly, and financially unviable Komarnica hydroelectric project. Given that the country already owns three large reservoirs, hybrid plants could provide even more stable and consistent annual production. **Hybrid power plants** involve a combination of larger solar power plants and green hydrogen plants, operating on the following principle: a significant portion of the electricity generated by the solar plant is used in the electrolysis process to produce hydrogen from water. During the times when solar energy is not available and cannot be sold on the market, it is used to generate green hydrogen. This hydrogen can be stored, transported, and sold. Additionally, a gas turbine plant could be built alongside the solar plant, producing electricity at night using green hydrogen from the same location.

One model of a hybrid power plant could be a combination of solar and wind power plants, working together to generate electricity while being paired with a larger storage capacity — containerised battery storage for energy storage and grid balancing. The effect of such hybrid power plants would be of critical importance for system balancing and providing consistent energy production. Since these hybrid plants are modular and dismountable, they would have minimal impact on local ecosystems, would not permanently alter the landscape and topography, and would offer significant savings in both funds and time compared to the complex Komarnica hydroelectric project.

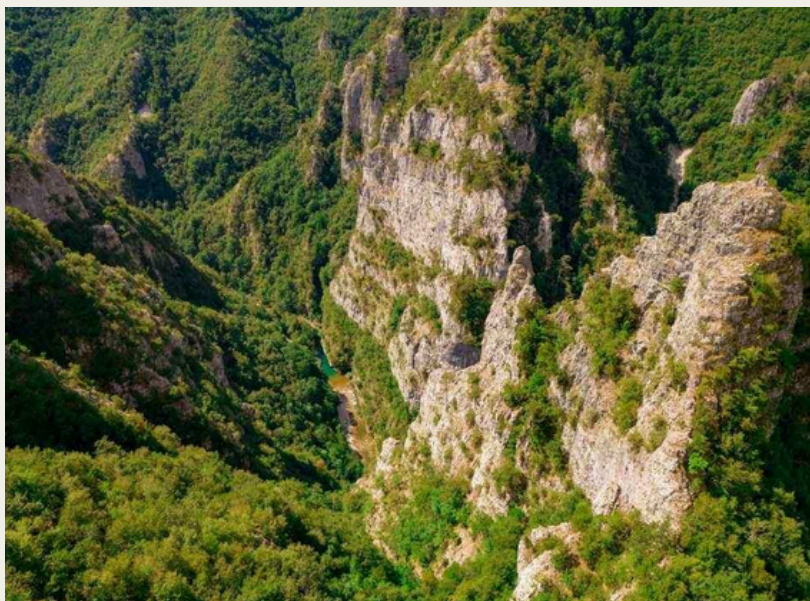
By fully leveraging the renewable energy generation projects currently in development and those that will be developed in the future, Montenegro could achieve an excellent energy mix. With the increasing use of energy storage systems and emerging new technologies, country could ensure complete and total energy independence, even after the closure of the existing thermal power plant.

From an energy perspective, if Montenegro and its national energy company require a new large source of hydroelectric power, there is absolutely no need to build the Komarnica HPP. The entire annual production of HPP Komarnica, under ideal conditions, can be substituted by installing an additional generator unit, A8, with an installed capacity of 58.5 MW and a projected annual production of 50 GWh at the HPP Perućica. The construction of HPP BOKA could also be considered, which would use water from the Bilečko Lake through underground pipes, with an installed capacity of 82 MW and a projected annual production of 158 GWh. However, more data is needed to assess the sustainability and environmental impact of this project.

These projects could be realized much more quickly and with far fewer investments than the long, expensive, and complex Komarnica project.

Shutting down the Pljevlja TPP by 2030 or 2035 presents a challenge, but this process is certainly feasible in the context of Montenegro's energy transition. To achieve this, the development of new renewable energy sources (especially solar and wind power), modernization of the energy infrastructure, and potentially the development of small nuclear reactors are essential. Additionally, key factors include the development of energy efficiency, increased regional cooperation (particularly in terms of electricity sharing and exchange, development of energy networks, and high-voltage transmission networks), and integration into the European electricity market. Considering the challenges, as well as the potential Montenegro possesses, the process of substituting production from TPP Pljevlja can be successfully realised with adequate investments, technical innovations, and political will to implement the energy transition.

Additionally, significant and exceptional results in the overall energy transition could be achieved by utilizing all incentive funds through various state programs, as well as new lines for energy efficiency from the EU pre-accession funds in the process of EU integration. It is estimated that improving energy efficiency between 2024 and 2034 could save up to 12.5% of Montenegro's total electricity production, while significant energy savings could also be made by investing in further development of high-voltage, medium, and low-voltage networks, with a continuous reduction in losses on these networks.



In the National Sustainable Development Strategy, as the key strategic document for Montenegro until 2030, it is stated that energy is one of the priority development sectors in the country. In order for this sector to develop in line with the principles of sustainability, efficient resource use, clean production and consumption, and to be a generator of employment and a green economy, it is necessary to continue supporting the use of renewable energy sources and energy efficiency measures. Main priorities of Montenegro's energy policy until 2030 are:

- Energy supply security – ensuring constant, secure, high-quality, and diversified energy supply to balance delivery with customer demands;
- Development of a competitive energy market – ensuring a liberalised, non-discriminatory, competitive, and open energy market based on transparent conditions, as well as enabling free market competition in non-monopoly activities (electricity and natural gas generation and supply), establishing energy pricing policies based on market principles, and creating conditions for free entry of new market participants (independent energy producers, suppliers, traders);
- Sustainable energy development – enabling development based on accelerated yet rational use of domestic energy resources, while respecting environmental protection principles, increasing energy efficiency (EE), and greater use of renewable energy sources (RES), in accordance with the socio-economic development needs of Montenegro.

Energy efficiency remains a key priority for achieving sustainable development goals and transforming the economy towards efficient resource use. The numerous benefits that society can gain from improving energy efficiency include savings, increased economic competitiveness, contribution to energy security, reduction in the need for new capacity, creation of new jobs, and more.

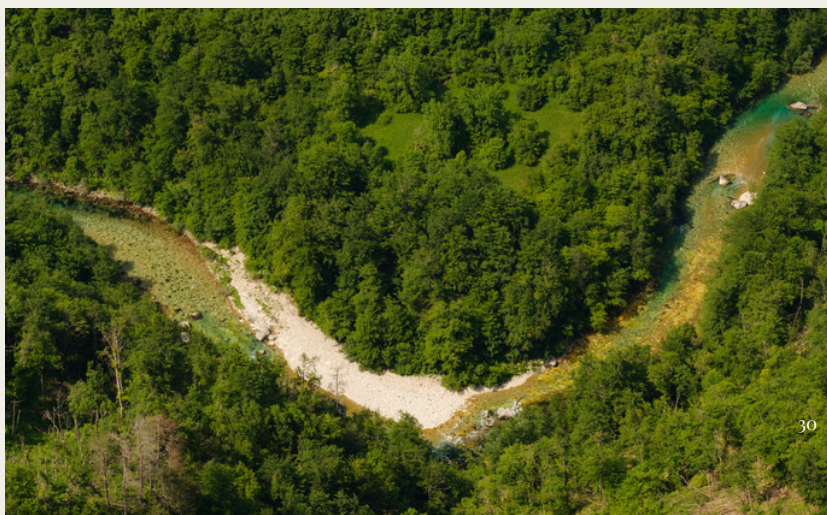
Given that the average production for the period from 2019 to 2023 is 1,754.42GWh, this implies that by applying measures and investing in energy efficiency, totalling around 30-40 million euros during the 2024-2034 period, an average savings of about 219.36 GWh could be achieved. This would correspond to the planned annual production of HPP Komarnica, which is projected to be 213GWh under ideal conditions.

The participation of renewable energy sources in final energy consumption stands at 29%, with the national target set at 33% by 2020. It is emphasised that **when increasing the share of renewable energy sources, special attention should be given to spatial protection and the application of European policies on habitat preservation, as well as maintaining good water status.** This automatically implies the cessation of any industrial and energy projects that would be in conflict with these principles, such as the Komarnica Hydroelectric Plant project.

In conclusion, it should be emphasised that the energy sector of any country, including Montenegro, must serve as a support for the overall development of society. Energy development should be systematically programmed and guided to achieve the desired energy policy goals. It is crucial to ensure the availability of sufficient energy in all forms at acceptable prices to enable the uninterrupted development of projects across various sectors. In this regard, energy policy must enable Montenegro's energy sector to develop as an open system, aligned with the EU energy system and the Energy Community, open to private, domestic, and foreign investments.

All previous research unequivocally indicates that the construction of the Komarnica HPP Plant is not only unnecessary from an energy standpoint but also economically unjustifiable. The relevant institutions **lack a key feasibility and justification study for this project, while expert opinions suggest that the project is too expensive, generates minimal energy, and, at the same time, destroys an irreplaceable natural asset that could never be restored.**

The Komarnica Hydroelectric Plant project is economically unfeasible, unnecessary in terms of energy, outdated, and most importantly, socially unsustainable. Ultimately, its implementation would have a serious negative impact on the environment, local communities, and biodiversity, leaving the people of Montenegro to face irreversible losses.



HYDROENERGY AND CLIMATE CRISIS

Hydropower depends on the availability of water in large reservoirs or on the intensity of river flow for production through run-of-river hydroelectric plants. Production is sensitive to precipitation and snowmelt, which allow for the filling of reservoirs. Droughts and associated low flows limit production.³⁰

The global growth rate of hydropower is declining, and this technology faces an **existential threat** in many parts of the world due to changing weather patterns linked to climate change. Historical droughts in many regions have proven detrimental to hydroelectric systems and potentially deterred potential investors. In 2022, major droughts in the Yangtze River basin in China reduced the developed hydropower potential by 26%, which posed a significant energy security problem for the region and the entire country. Similar challenges were recorded in Brazil, the United States, Mediterranean European countries, and other locations around the world.

Critically, these events are not isolated incidents nor characteristic of a particularly hot and dry period; the risk of similar extreme droughts in the future is increasing by nearly 90% in some climate scenarios. For countries already struggling to meet energy security needs, any threat to capacity could lead to significant economic shocks. Even if hydropower can still generate at 80% capacity during severe droughts, that 20% difference can be crucial for economies facing limitations.³⁰



Today, we know that the Mediterranean region is warming 20% faster than the global average, meaning that for every 1°C rise in global temperature, the Mediterranean is warming by at least 1.5 to 2°C. This seriously affects water availability, as well as the health and well-being of the region's population.³¹

In some parts of Europe and the Mediterranean, hydropower production could decrease by up to 40% with a temperature increase of 3°C. Climate change has long-term impacts by nature, highlighting the need for long-term planning and investment vision within the energy sector.³²

Analyses show that climate change will lead to an annual decrease in hydropower production in the Drin River basin by 15-52% by the middle of the century. It is estimated that in Albania, annual hydropower production from the Drin basin could decrease by up to 40%, and a similar situation is predicted in North Macedonia, where production could decrease by as much as 52%. Albania's energy system will bear the strong consequences of climate change, given that its energy production is almost exclusively based on hydropower. Due to this reliance on hydropower, Albania will need to triple its investments in solar and wind power to mitigate the risks of climate change and compensate for the reduction in hydropower from the Drin basin.³²

It is important to note that investments in solar and wind energy not only help mitigate the effects of climate change but also increase energy independence and reduce electricity imports. This insight **highlights the importance and cost competitiveness of renewable energy sources other than hydropower, not only from the perspective of climate change but also in terms of energy security.** From the standpoint of minimizing costs in electricity supply planning, renewable energy sources that are not hydropower play a crucial role in mitigating the impact of climate change on electricity supply security, especially in the long term.³²

The impact of climate change is already noticeable in our region, as seen in the example from 2017: the Piva and Perućica hydroelectric plants produced half as much less energy due to significantly lower rainfall than usual, but also due to poor water management in Montenegro. According to numerous studies, the intensity of climate change is certainly expected to increase, which is yet another reason why hydropower is no longer a reliable energy source, and hydroelectric plants will no longer be able to serve as "batteries" as they once did.

At the same time, due to the specific services they provide—ecological, social, and economic—biodiversity-rich and preserved areas contribute to the adaptation of both people and nature to new climatic conditions, help mitigate climate change, and represent natural solutions in the fight against the climate crisis.

CHAPTER IV

TRADITIONAL VALUES – AGRICULTURE, CULTURE, AND OPPORTUNITIES FOR DEVELOPMENT THROUGH SUSTAINABLE TOURISM

Life in Šavnik

The characteristics of Šavnik stem from its potential, which lies in its natural resources. The exceptional beauty of the landscape is owed to the specific agro-landscape, represented through hilly and mountainous areas, as well as the water potential that has shaped its identity through a significant wealth of flora and fauna, along with the unique architecture of the katuns (traditional shepherd's huts) and towers. Historically, people lived in harmony with nature, directing their activities towards agriculture with an emphasis on livestock farming and a nomadic lifestyle, which changed in the period after World War II when migration occurred towards the small town of Šavnik, and further towards Nikšić. The next wave of emigration occurred during the transitional period of the 1990s with the closure of factories and larger agro-companies such as Sinjajevina. The villagers, who predominantly lived in rural areas, still earn their livelihood through agricultural activities, although there is a trend of decreasing livestock and agricultural land, alongside the rapid abandonment of villages and the aging population in rural areas.³³

The rural areas of this municipality have faced or are facing pressures such as: uncontrolled logging in Dragišnica within the boundaries of the Nature Park, the planning of a hydropower plant on the Bukovica River (project stopped), and in the meantime, a dangerous threat in the form of the potential realization of the Komarnica hydropower plant project.



Agricultural specificities

Agricultural landscape is classified as a cultural continuous landscape of unity between people and nature, with sustainable land use, while pastoralism can be understood through intensive or extensive use of wild plant species for grazing and nomadic migrations.

The area of Komarnica is suitable for the development of integrated and organic agricultural production due to the absence of pollution. Organic production aligns with sustainability principles and biodiversity protection, and is particularly important for smaller producers in terms of economic benefits.

Due to the rich floristic composition and climate, the area is ideal for stationary, nomadic, and migratory beekeeping. The absence of pollution and other pressures makes it suitable for organic beekeeping as well. The effect of these factors can ensure the production of high-quality polyfloral honey. Evidence of this is the fact that in 2023, the accredited body "Monteorganica" issued three organic certificates for honey, with a total production of 7,350 kg of organic honey in the Šavnik area. Five producers from this municipality were in the transitional period for organic honey production in 2023, with one producer engaged in fruit growing.

Komarnica and Šavnik area, as a hilly-mountainous region, is ideal for livestock farming, particularly sheep farming. It is home to the autochthonic breed of sheep "jezero - pivska pramenka" and the hilly - mountain (*mne. brdsko - planinski*) horse of horses, including local breeds such as the gray cattle and the "šjenička pramenka", which are of significant agro-biodiversity and historical importance.

The Komarnica area is also known for the production of "duška buckwheat" (buckwheat from Duži), whose seeds have been preserved in their original form by the local population for centuries. This high-quality product, with historical roots and traditional processing methods, possesses all the characteristics of a product that should be protected by some quality scheme. Buckwheat is a good source of bee pasture, where approximately 200 kg of honey per hectare can be produced.

Based on molecular evaluation conducted at the SASA Institute in Scotland, the accession MNE 00135 domestic white potato (preserved in the Montenegrin Gene Bank), it was determined that it possesses a unique genotype and originates from Boan in Šavnik.

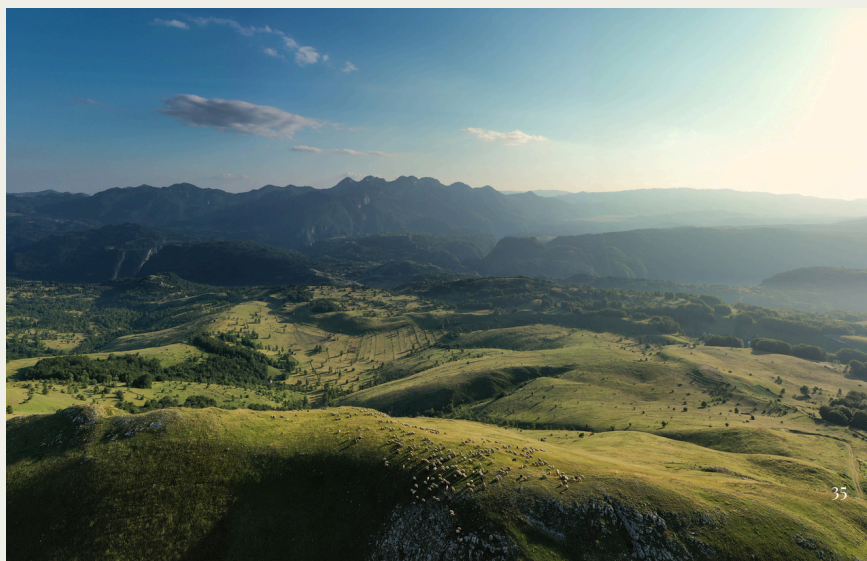
Impact of the Planned HPP on the Agriculture of Surrounding Villages

Hydroelectric power plants not only leave permanent aesthetic and landscape consequences but also directly and indirectly negatively affect the characteristics of an area upon which the agricultural production of that region depends.

Negative impact of the planned hydropower plant on the agriculture of Komarnica area can be viewed from the perspective of food security,³⁴ as this type of production is sensitive to climate change, temperature rise, and air humidity, the changes of which are evident, especially when observed through local climatic variability. This is reflected in: the impact on the loss of adaptive capacity of cultivated varieties, reduced productivity, and the effect on agricultural practices and space.

Climate change (humidity/temperature) would allow new species of insects to enter, as well as the spread of vector-borne infectious diseases, bacterial and parasitic infections, and agricultural pests. Construction of the HPP would lead to the conversion of clean mountain river water, thus deteriorating its physical-chemical characteristics, composition, and quality; as well as to the degradation and erosion of land, the loss of humus, the loss of soil biota, and the deterioration of its physical-chemical characteristics, all exacerbated by wind and water, under the strong influence of construction work on both sides of the canyon.

Products from the Šavnik area may not quantitatively meet market demands, but they can certainly compete in terms of their quality and uniqueness. These qualities are based on uncontaminated soil, water, air, as well as the floristic composition and the climatic and microclimatic conditions of the area. Projects such as the construction of the hydropower plant on the Komarnica River can permanently damage and disrupt the natural balance, which directly affects the quality of the products for which Šavnik is known today.



Cultural Heritage of the Drobnjaci

Cultural heritage (cultural inheritance or cultural property) refers to goods that have been inherited from previous generations or those that are created in the present but have specific value for people and should be preserved for future generations. Cultural heritage is divided into material and immaterial.

Material cultural heritage includes: exceptional buildings (sacred or secular), monuments, and material works of art. Immaterial cultural heritage includes: oral traditions, expressions, language, knowledge, and skills related to nature and the universe, social practices, customs, folklore, and traditional crafts. Cultural heritage is also divided into movable and immovable property. Immovable cultural property includes: cultural monuments, spatial cultural-historical complexes, archaeological sites, and notable places. Movable cultural property includes: artistic-historical works, archival materials, film materials, and old and rare books.

The term *Drobňjak* refers to a natural-geographical unit that extends from the top of Vojnik (to the south) to the Tara River (to the north), branches of the Piva Mountain (to the west), and the peaks of Lola, Semolje, and the eastern slopes of Sinjavina (to the east). Here, we will primarily focus on the cultural heritage of southern Drobňjak (Vale drobnjačke), which coincides with the territory of the municipality of Šavnik and almost completely with the watershed of the Komarnica River. It is worth noting that Drobňjak, in a natural-geographical and socio-historical context, is a unique unit that, together with Piva, forms a distinct Durmitor region.

The name *Drobňjak* most likely originates from the Latin term for road (*mne. drum*). Two caravan routes passed through Drobňjak: Nikšić - Krnovo - Žabljak - Pljevlja and Nikšić - Brezna - Duži - Žabljak - Pljevlja. Drobňjak was inhabited even in prehistoric times. This is evidenced by numerous tombs from that period, known locally as "gomile" (mounds). Recent research indicates that they are found throughout Drobňjak, with the most numerous (or most explored) being those in Duži and Dubrovsko.

Numerous *stećci* (medieval tombstones), locally known as Mramorje, Greek, and sometimes wedding cemeteries, date back to the Middle Ages. They are found within the basin on both sides of the Komarnica River (Pošćenje, Previš, Duži, Rudinice), as well as on the mountains (Bare Žugića, Studena...). *Stećci* are mainly carved from limestone. They feature a wide range of decorative motifs and inscriptions, representing iconographic continuities in medieval Europe, as well as locally recognisable traditions. *Stećci* are an exceptional testimony to the spiritual, artistic, and historical aspects of medieval cultures in Southeast Europe, an area where the traditions and influences of Western, Eastern, and Southern Europe intertwined with earlier traditions. The area with *stećci* is protected by UNESCO as a site of "Outstanding Universal Value," meaning that their cultural significance is so exceptional that it transcends national borders and is of common importance to present and future generations of humanity.

A special unit of the Drobñjak region is its rich architectural heritage, which ranges from poor *savardaks* (small huts), to cottages, shepherd's huts, and to magnificent towers that were envied even by wealthier regions. The most famous are certainly the towers of Duži. Between 1830 and 1840, every brotherhood in Duži built its own tower, along with the Church of Saint Sava (1837), as noted by Konstantin D. Petković. The towers were often demolished and rebuilt, expanded, or shortened. The oldest Drobñjak tower that has more or less preserved its original form is the tower of Đoko Malović in Duži (1834). The towers are found in Pošćenje, Komarnica, Previ, and other Drobñjak villages, where each has one or two towers.

The architectural heritage also includes bridges, monasteries, and churches. Among the bridges, the oldest are the Roman Bridge on the River Bukovica; the Odov Bridge on the River Bijela; and the Aleksandar Bridge in Lower Bukovica. There are also a larger number of smaller bridges, while some hanging bridges (Duške lazi, Pridvorica...) have been carried away by torrents long ago. These two bridges were once highly attractive.

Traditional crafts to mention include woodworking, weaving, tailoring, and embroidery. In the images below, some of the products of Drobñjak woodworkers can be seen: barrels, kettles, stakes, and small carts (on the right), as well as the male and female traditional Drobñjak clothing, hand-made (on the left). The photo features Danica and Miraš Tomić from Previ, in the mid-20th century.

The Drobñjak dialect is perhaps the most valuable cultural asset. It was once used by Vuk Karadžić as the basis for the Serbian literary language. Many travel writers have noted Drobñjak's oral tradition as valuable historical and linguistic material. Although unexplored, Drobñjak's games, songs, and customary law still occupy an important place in the spiritual wealth of the area, whose significance broadly exceeds the territory of present-day Montenegro. The same can be said for the natural and geographical features of Drobñjak. Although located in the center of Montenegro, most of Drobñjak's natural landmarks are unknown to the broader public.



Sustainable Eco Tourism

Šavnik, a small mountain town, is perhaps best known for the amusing saying that over there "the sun rises twice a day". However, this town, located at the confluence of three rivers and surrounded by mountain ranges, offers much more than just humorous stories.

Territory of Šavnik stretches across the slopes, valleys, and plateaus of the Durmitor, Sinjajevina, and Vojnik mountain ranges. Diversity of natural landscapes, from impressive mountain ranges and glacial lakes to vast forests, green pastures, deep canyons, and picturesque river valleys, gives this area a unique charm. This natural mosaic, intertwined with cultural heritage, holds immense potential for sustainable development, grounded in authentic natural values, enriched by local products, and the traditional cuisine of the locals living in the area.

In terms of natural characteristics, Šavnik municipality represents an exceptional area, with great potential for ecological, rural, and outdoor tourism. Despite its relatively small area, there are numerous natural attractions and facilities suitable for the development of four-season active tourism, agro-tourism, eco-tourism, health tourism, and their various subcategories.

Hidden among mountains and green meadows, interwoven with clear rivers and wild canyons, Šavnik offers an authentic experience that reflects the traditional Montenegrin way of life in one of the most dramatic natural areas of Montenegro.

With its unique geographical position, this region has all the prerequisites to become a center for adventure and sustainable agro-rural tourism in the Balkans.



Rural areas, which make up the majority of Montenegro's territory, offer perfect opportunities for ecological and sustainable tourism throughout all seasons. However, it is essential to approach the development of content and accommodation capacities carefully in order to preserve authenticity and tradition without compromising the natural environment.

In the past decade, the first steps have been taken toward valuing authentic values — through the construction of eco-villages, marking hiking and biking trails, and involving local populations in development policies. Unfortunately, many potential opportunities still await proper valorisation and enthusiastic individuals who will launch sustainable tourism projects.

Nevidio Canyon, one of the most attractive canyons in the region and a symbol of Šavnik and all of Montenegro, has been attracting canyoning and extreme sports enthusiasts from around the world for years. Canyoning through Nevidio, also known as descending through the ravines, involves hiking, swimming, and climbing downstream through the river in special suits that allow visitors to enjoy the icy waters flowing from Durmitor towards the south. Nevidio offers a unique canyoning experience, while the crystal-clear waters and untouched nature delight all extreme sports enthusiasts.

Although it has become a well-known brand thanks to word-of-mouth recommendations from satisfied visitors, the potential of this area far exceeds just canyoning. More and more local businesses, eco-villages, and individual guides are independently refining their skills and organising tours for the growing number of visitors, providing them with an unforgettable experience in this area.

This region is not only a paradise for canyoning but also for numerous additional outdoor activities. Among them are hiking, mountain biking, kayaking, rock climbing, sport fishing, snowshoeing, backcountry skiing, as well as thematic walks like the "bear trail" or the "medicinal herb trail." All these activities are enriched by authentic local cuisine and agritourism, making this seemingly small, yet incredibly rich area, the perfect destination for unforgettable experiences in nature.



Komarnica River, a jewel among the emerald mountain rivers of Montenegro, stands out with its impressive canyon, which remains largely untouched by human influence, save for the confluence with the Piva River, where the Piva Reservoir submerges the river's final stretch. The eastern cliffs of the canyon belong to the mountain ranges of Piva and Durmitor, while to the west of the canyon rises Mount Vojnik, whose foothills are adorned with vast karst fields. Rare settlements, such as the villages of Brezna and Duži, are situated on the plateaus, leaving the river completely pristine and preserved. The Komarnica Canyon is a true sanctuary of wilderness, devoid of roads and bridges, with human activity limited to the high elevations far above the canyon, thus protecting it from harmful impacts.

This canyon is increasingly attracting the attention of nature lovers and adventure tourists. Enthusiasts and professionals in active sports, such as kayakers from the *Save Komarnica* initiative, draw an ever-growing number of visitors from around the world each year, highlighting the enormous potential of this area for sustainable tourism.

Miljko Bulajić - Gigo and his team from Balkan Expeditions, part of the movement for the preservation of Komarnica, are currently the only ones organising pack-raft and kayak tours in the canyon. Their tours, carefully timed for 3-4 hours, allow participants to enjoy nature while fully respecting the ecosystems.

The descent down the Komarnica begins with a hike from Brezna, carrying all the necessary equipment. Stable and manageable pack-rafts, ideal for beginners, are used, while the most experienced kayakers can embark on the adventure of a lifetime, paddling the Komarnica from Šavnik to the Piva Reservoir. The middle section of the river is not too fast, and its shallow, cascading flow with alternating rapids (class II and III in early to mid summer) and calm, green stretches make it perfect for adventurers of all experience levels. At the end of the descent, the river flows into the calm waters of the artificial Piva Reservoir, which is no longer attractive for white-water kayakers, where a boat awaits them, concluding an unforgettable journey through this pristine corner of nature.



In recent years, the "Save Komarnica" initiative has actively promoted this canyon, attracting an increasing number of visitors and reminding them of its significance for sustainable tourism and its crucial role in preserving its wilderness.

Cycling, especially mountain e-biking, is becoming an increasingly popular segment of active tourism. In recent years, it has been intensively promoted by local ethno and eco villages, as well as experienced guides from Šavnik and the neighbouring Žabljak. From paved roads to dirt paths, downhill, uphill, forests, lakes, rivers, canyon edges, and historical sites – this area offers something for everyone. This activity provides a unique opportunity to explore mountain trails with a guide, discovering the Durmitor, Vojnik, and surrounding mountain ranges, while enjoying spectacular views throughout the ride.

Hiking is also becoming an increasingly attractive option for tourists, offering a variety of routes – from easy educational village trails through Šavnik villages, ideal for day trips, to challenging yet awe-inspiring paths that lead over the slopes of Durmitor, Vojnik, and other mountains, or into the very heart of the Komarnica River canyon.

Backcountry skiing and snowshoeing are becoming more popular winter tourism activities in this area. Located in close proximity to the Durmitor National Park, this area offers numerous attractive locations that provide unique experiences for winter sports enthusiasts.

As part of the *Save Komarnica* initiative, more cliffs have been equipped with complete infrastructure for rock climbing, making this adventurous sport more accessible to climbing enthusiasts. The area around Komarnica is rich in rocks of exceptional potential that could be further utilized for this purpose, providing even more opportunities for the development of climbing tourism.



This area, although seemingly modest, stands out due to its exceptional variety of activities that cater to nature and adventure enthusiasts. This unique concentration of opportunities places it among the most attractive destinations for outdoor tourism in the region.

It is particularly important to emphasise that all these activities make sense only with the active involvement and development of the local population, which is still not fully aware of how preserving the area in which they live can simultaneously improve their living standards and generate income from the work and products they already offer.

The key lies in connecting existing offers, tourist guides, and local communities to create a synergy that attracts visitors and benefits everyone. Minimal investments are needed to steer the development of this area towards sustainable use of natural resources, ensuring long-term benefits aimed at preserving nature and the well-being of the locals.

The construction of a hydropower plant on the Komarnica River would make this area less attractive to tourists, as today's tourists, especially from more developed countries, seek to experience the wild nature that no longer exists in their home countries. The construction of the Komarnica HPP would directly affect the tourist offer: ground vibrations would threaten canyoning in Nevidio, rising temperatures would jeopardise winter tourism opportunities, kayaking on wild waters would become impossible, increased humidity could impact rock climbing offerings, and climate changes could negatively affect the quality of the authentic agricultural products from this area, and thus the gastronomic offer of the region.



CONCLUSION

The fact is that modern life is unimaginable without electricity. Every activity we engage in, from the simplest daily needs to complex industrial processes, depends on electricity. Energy independence is crucial for the self-sufficiency of both states and individuals. At the same time, Montenegro needs new, clean energy sources, especially due to the inevitability of shutting down polluting sources like the Pljevlja Thermal Power Plant. With the closure of the Pljevlja TPP, Montenegro would face the loss of up to 40% of its energy, creating a significant deficit that even seven hydropower plants like Komarnica cannot compensate for.

Hydroelectric projects like the planned Komarnica HPP are relics of 19th-century energy infrastructure, outdated and energy-inefficient today. Such projects are extremely costly, produce relatively small amounts of electricity, and in return, irreversibly destroy invaluable natural resources, as wild canyons are among the most endangered ecosystems on the planet. Montenegro has already sacrificed the Piva River and a significant portion of the Zeta River for energy independence. Today, instead of relying on outdated hydropower projects, Montenegro can achieve energy independence by developing a sustainable energy mix.

The backbone of this mix could consist of existing large hydroelectric plants like Piva and Perućica, combined with renewable energy sources such as solar and wind. By improving energy efficiency, implementing green hydrogen technologies, and adopting principles of circular economy, Montenegro can become an energy-efficient, independent, and clean country. **Montenegro does not need outdated hydropower plants but rather a vision for the future where energy independence goes hand in hand with preserving our most valuable natural heritage.**

The planned construction of the Komarnica HPP poses a serious threat to one of the last untouched natural jewels of Montenegro, the Balkans, and Europe. The unique landscape of the canyon, with its steep cliffs and mosaic of rare habitats, is a key biodiversity center for the region. The destruction of the canyon, the flooding of protected habitats, and the collapse of the ecological integrity of the entire area would be consequences that no, especially not an unprofitable energy goal can justify.

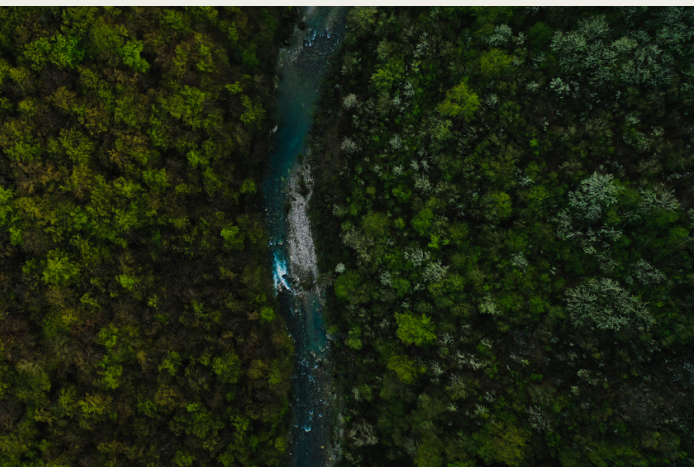
Komarnica is not just a river; it is a treasure trove of life, a symbol of natural beauty, and a testament to the strength of the harmony between humans and nature. Its canyons are a sanctuary for many species, and its landscape has inspired generations. At a time when climate change and global destruction of natural habitats demand responsibility, protecting Komarnica becomes a moral imperative.

We call upon the authorities of Montenegro, the international community, the scientific public, and all nature lovers to join forces through concrete actions: supporting research and monitoring of Komarnica's biodiversity, promoting sustainable development of local communities based on rural eco-tourism and organic farming, and advocating for genuine protection of the canyon. Through such initiatives, we can prevent this devastation and ensure that Komarnica remains a beacon of natural values and sustainable development.

Instead of becoming yet another victim of short-sighted development plans, Komarnica can become a global example of how natural beauty can be preserved and valued through eco-tourism, organic farming, and scientific initiatives.

Save Komarnica – for us, for future generations, and for the nature entrusted to our care and protection. Through our efforts, we can demonstrate that it is possible to achieve a balance between development and conservation, and inspire the world with the example of how natural treasures can and must be preserved and used for the benefit of all.

Spasimo Komarnicu



We are deeply grateful to those who have joined this collective effort and contributed to the preservation of the Komarnica Canyon, their dedication means the world:



locals



kayakers

scientists

fishermen

legal experts



economists

energy experts

tourism experts

artists

activists

journalists

*foundations for wild
rivers protection*

*and other nature and
Komarnica lovers!*



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- 23.** Relict species is a remnant from the past, once widely distributed, but now rare and living in areas with specific suitable conditions.
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