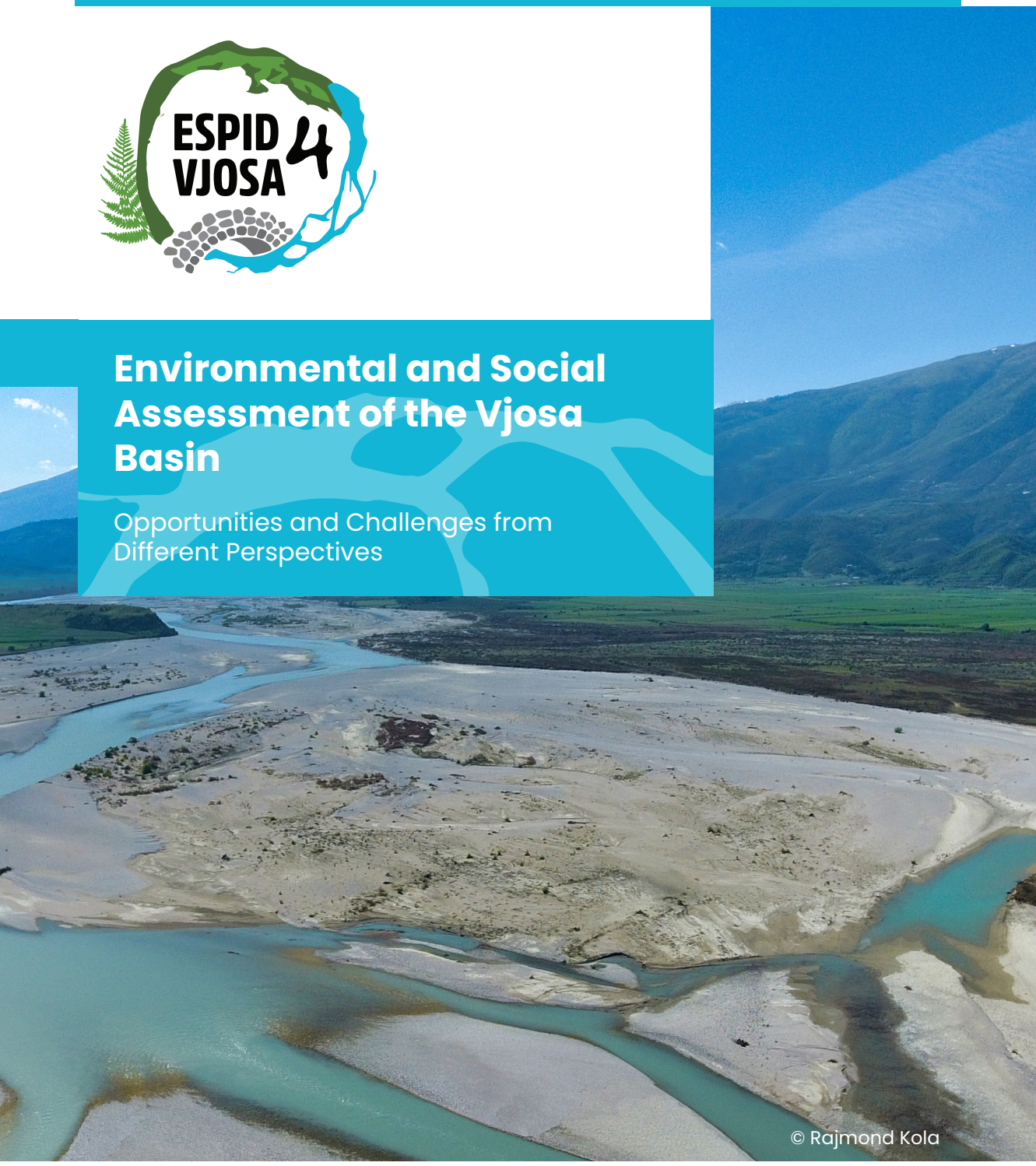
ESPID 4 VJOSA

Environmental and Social Assessment of the Vjosa Basin

Opportunities and Challenges from Different Perspectives



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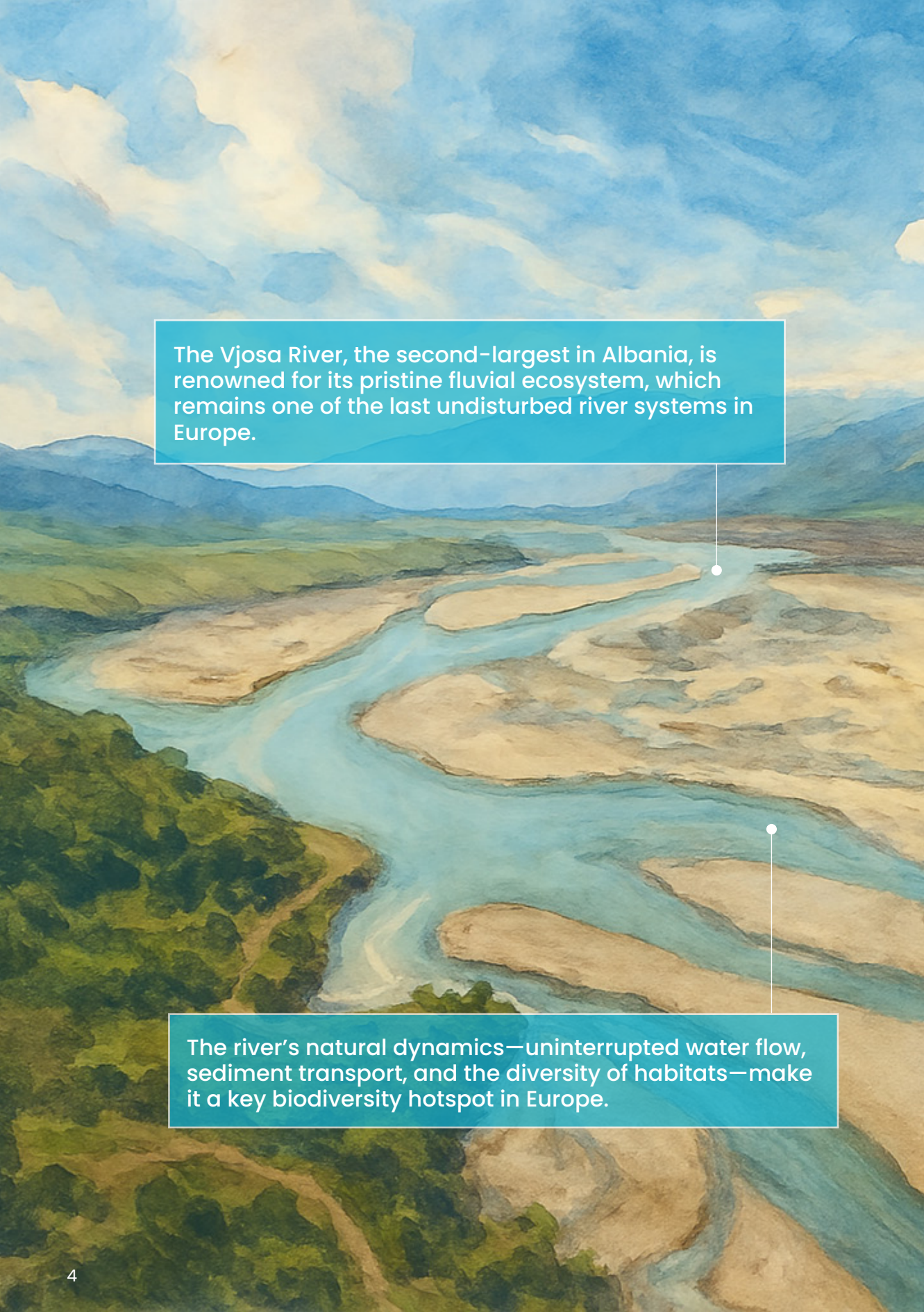
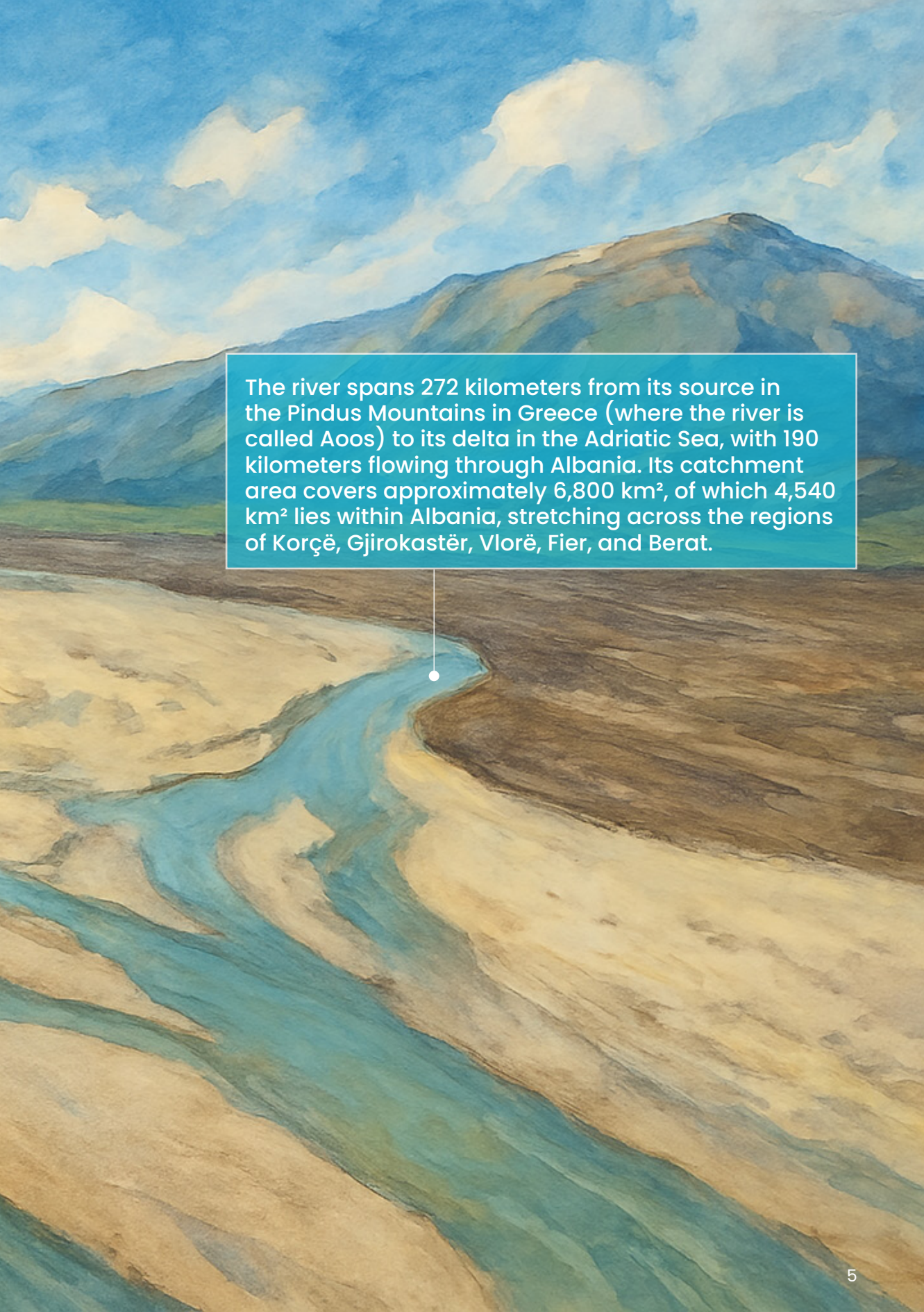


The Vjosa River, the second-largest in Albania, is renowned for its pristine fluvial ecosystem, which remains one of the last undisturbed river systems in Europe.

The river's natural dynamics—uninterrupted water flow, sediment transport, and the diversity of habitats—make it a key biodiversity hotspot in Europe.



The river spans 272 kilometers from its source in the Pindus Mountains in Greece (where the river is called Aoos) to its delta in the Adriatic Sea, with 190 kilometers flowing through Albania. Its catchment area covers approximately 6,800 km², of which 4,540 km² lies within Albania, stretching across the regions of Korçë, Gjirokastër, Vlorë, Fier, and Berat.

2022

Declaration of Vjosa as a Nature Park

2023

Declaration of Vjosa as a National Park

2024

UNESCO Heritage Site Recognition Process Launched

The declaration of Vjosa as a Nature Park in 2022 and then as a National Park in 2023, as well as the launch of the process for the recognition of the Vjosa Valley as a UNESCO heritage site in 2024, are the key milestones of developments in the context of nature conservation on one hand. On the other hand, during this period and until the drafting of this report, work has continued on the drafting of the Integrated Management Plan for the Vjosa River Basin. In all these processes, the ***ESPID for Vjosa project has contributed by supporting scientific expeditions that have generated data as arguments to support decision-making for nature conservation,*** or even data related to the pressures and main issues that will be addressed in more detail in this report that would ***serve to the development of the Vjosa IRBMP.***

Furthermore, the projected aimed to supports the management authorities such as KBU, AMBU and the Municipality of the Vjosa Valley to undertake the appropriate policies regarding the governance of this geographical area having as its backbone the National Park. The aims of the project were implemented with different methodological approaches by involving;

- The people of the Vjosa basin based on a novel form of public participation
- National experts
- International experts for supporting and reviewing the present concerns, future needs and possible solutions for seven different topics, which were adressed in the project;

Flood and Flood risk management

Protected Areas

Natural Resources

Tourism

Hydropower and Renewable energy

Climate change

Water supply and Wastewater treatment

The main outcomes of the consolidated expert approaches (national and international) can be summarized as follows: ***For Flood and Flood risk management,*** the vulnerability of society towards flood impacts increase with both (i) climate change and (ii) population and economic growth as settlemetns and infrastructure are using contiunously active and former flood plain areas. Parts of the Vjosa basin feature a high vulnerabilty to flood impacts. Especially to lower part of the river contained severe floodings with high damages and losses for settlements and among the local population. However, the risk management and mitigation strategies are addressed in the national legal framework. The existing approaches for the management, however, show some risks with the international requests from the EU-legislation as the implementing institution in Albania belongs to the agriculture sector. In addition to the listed challenges and corresponding measures for improvement this specific constelation of the financing and implementation strategy in Albania is something which need to be evaluated and implemented according to EU-standards in the near future. Moreover, at the present state, the flood management and the planning of flood mitigation measures is coordinated and financed by the agriculture sector in Albania. This situation is challenging, as there is the risk, that also agricultural land is targeted to be protected by active flood management, like building of dykes. This is not in line with the aims of the EU-Floods Directive, which explicitly addresses that passive flood protection has to be prioritized compared to active measures, meaning that the inundation of agriculture land (providing retention) is mandatory in terms of the EU-Floods Directive.

Main objectives in the work on ***Water supply and Wastewater treatment*** were of identifying the principal sources of pollution and proposing concrete measures for the rehabilitation of the Vjosa River and its protection as one of Europe's most significant ecosystems. According to the analyses carried out, the ESPID study proposes the following priorities and recommendations:

Addressing the risk of irrigation

other water-efficient methods has the potential to alleviate the strain on the river's resources, thereby contributing to the sustainability of the river system. Another potential solution is the establishment of buffer zones. This approach could facilitate the prevention of agricultural runoff, as the vegetation planted along the riverbanks has the capacity to filter pollutants before they reach the water

Which exerts a considerable influence on river ecosystems, with ramifications that extend to a multitude of levels, including

Climate change

the availability of water, the quality of habitats and the diversity of species. In order to address these changes, strategies are divided into two categories: adaptation and mitigation actions:

a. The management of water resources through the creation of reservoirs during periods of heavy rainfall by preventing water withdrawal, especially in dry seasons.
b. The renaturation and habitat conservation through the restoration of wetlands and banks and the protection of riparian forests

The discharge of sewage into rivers presents a significant threat to river ecosystems. To mitigate this negative

Addressing the reduced sewerage coverage

impact, it is necessary to invest in the construction of the sewage system in areas where coverage is very low or low. Furthermore, constructed wetlands and green infrastructures are natural treatment systems that filter pollutants and reduce the impact of sewage on rivers by using vegetation and soil to absorb and break down contaminants. Riparian buffer zones (vegetation along riverbanks) could also be effective in filtering pollutants before they enter the water and provide habitat for wildlife and

The institutional organisation

The difficulties in terms of institutional and human organisation are related to the coordination of the different stakeholders, both at the institutional level and at the intersectoral level (since the management plan requires the cooperation of stakeholders from different sectors, and not only those directly involved in water management). On the other hand, if the primary legislation is complete and in line with the European Union directives, the secondary legislation (instructions, regulations, national directives) that would complete the primary legislation is missing. Human resources are an easy challenge, since the IFRM concept requires the identification, analysis, and calculation of flood risks. This requires human resources that are trained and capable of collecting, processing, and analysing statistical data from many operational sectors.

In the chapter of ***Hydropower and Renewable Resources*** the status, challenges and possible solutions for the renewable energy sector in Albania are described. The analysis of qualitative and statistical data shows that Albania continues to be highly dependent on energy imports, especially in the oil sector. In the field of hydropower, 252 concession agreements have been signed for the construction and operation of small hydropower plants in the country with 58 such plants planned in the Vjosa River Basin.

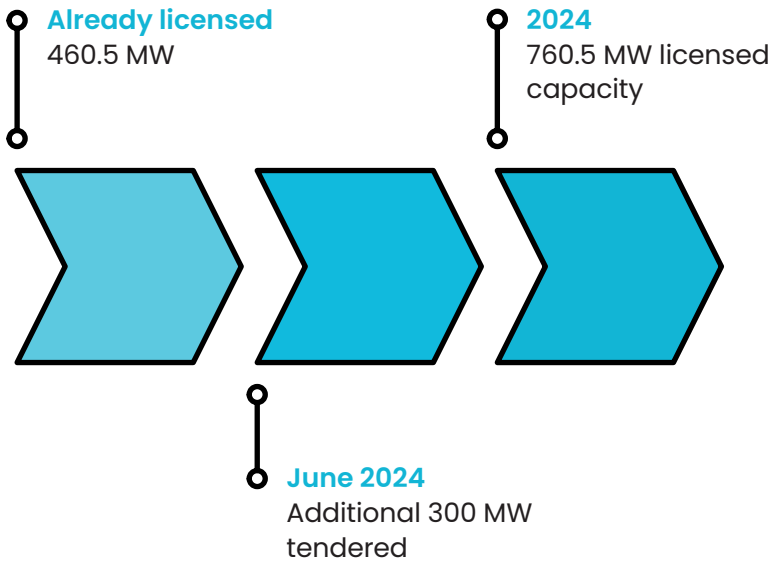
58

Planned plants in the Vjosa River Basin.

252

Concession Agreements

However, there is debate regarding the exact number of concessions permits as there is no central official database that registers all concessions in all stages of implementation. On the one hand, Hydropower experience in Albania is among the most developed in the region, with hydropower constituting about 99% of the installed capacity. On the other hand, the potential for solar and wind energy is high, with significant solar irradiance in Albania. Thus, the development of solar energy technologies is shifting the government's energy policy, turning the country into a high-potential destination for renewable energies.



Government plans for licensing 1.2 GW of new capacity are progressing positively, with 460.5 MW already licensed and an additional 300 MW were expected to be tendered by June 2024. This will result in 760.5 MW of licensed renewable energy capacity by the end of 2024.

A swift shift toward new capacities without a strategic master plan that considers all technical, economic, security, and development aspects may pose challenges to the country's physical infrastructure, overproduction, and potential system shutdowns due to a lack of transmission capacity. Additionally, this could lead to a financial gridlock in feed-in and CfD subsidy systems, as well as cybersecurity issues in the energy sector. Recommendations to address these challenges include increasing investments in energy infrastructure, revising policies and laws in the energy sector, and improving collaboration with local communities on renewable energy projects. There is also a need to build institutional and technical capacities to promote the use of renewable energy technologies in the Vjosa Valley and to develop local technical capacities. In conclusion, this chapter in the technical report on hydropower and renewable energies in Albania, with a particular focus on the Vjosa Basin, analyzed deficiencies in three priority areas and nine specific shortcomings.

It also suggested measures for institutions, the academic community, and both local and central government authorities to address these issues effectively due to:

Community Engagement

Albania is recently witnessing a shift in its strategic energy orientation towards solar and wind energy, with an investment potential of up to 1.2 GW,

Government Role

Although renewable energy (solar and wind) are decentralized resources, in Albania this phenomenon is entirely political and centralized by the central government

Business Awareness

There is a low level of awareness among small businesses and enterprises in the Vjosa Valley region about investment opportunities in self-production or energy efficiency amid the energy crisis and the government's plans for liberalizing the energy market

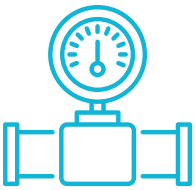
Local Governance

Local governance in the 11 municipalities of the Vjosa Valley should be activated and take a proactive role in informing businesses, creating energy communities in the area starting with pilot zones. The energy community in Kute could serve as a pilot and, subsequently, actions could be extended throughout the valley

Academic Collaboration

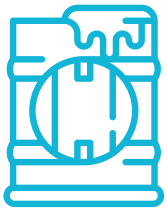
The academic community in the Vjosa Valley (Vlora and Gjirokastra) should collaborate with research projects and technical institutes to establish a training program for young people in the field of renewable energy, with a particular focus on women and girls. This would enable the creation of new job opportunities in a growing sector, reduce youth depopulation in the area, and narrow the gender gap. These conclusions aim to address the challenges and strengthen the development of renewable energy in the Vjosa Valley by incorporating a decentralized approach, informing local businesses, and involving academic collaboration and civil society for the youth.

The Vjosa Valley is renowned for its ecological importance and biodiversity. In addition, it is also well known to be rich in various natural mineral resources, figured out in the Chapter ***Natural Resources***, including:



Natural Gas

Oil



Bitumen

Coal

Such natural minerals are found underground in Drashovica, Gorisht-Kocul and Cakran-Mollaj, in the form of natural gas and oil at a depths of 100-4500 meters. Surface mining for limestone and silica, covering a total surface area of 9.2 km2 is also taking place in the Vjosa Valley, as it does across Albania. However, extracting raw materials such as sand, gravel, and stones from the water basin's coasts and beaches is forbidden in protected areas (Law 11/2012 on Integrated Management of Water Resources, Article No.67). Nevertheless, these mining activities are taking place in the Vjosa and in many river systems in Albania and the law is not executed in terms of permits for mining are missing. But beside the aspects of natural gas, oil, bitumen, and coal also forestry and agriculture have to be labeled as natural resources. And thus the ESPID work came up with overall conclusions and suggestions for an improved management in the future:

1

Develop a management plan for Vjosa water basin through a multi-sectoral approach with special focus on the agriculture sector and the exploitation of natural ressources industry, that promotes the balanced utilization of water resources in both the agricultural sector and the hydrocarbon industry.

2

Restricting mining activities in the basin requires a comprehensive and critical evaluation of existing licenses and their impacts on the river system. This evaluation should consider various environmental, social, and economic factors to ensure well-informed decision-making. Especially overmining in the vicinity of the National Park may harm biodiversity.

3

To orient agriculture towards a multi-functional agricultural model which positively affects good management of the rural area, the preservation of the environment and rural identity as well as the increase of employment in the area. This way, integrated farming is encouraged by optimally reducing damage to the environment.

Moreover, (iv) to create an enabling condition for livestock food base by establishing forage systems in order to completely eliminate irresponsible grazing of livestock in forests, (v) to support farm families with alternative forms of energy security, avoiding logging, (vi) to develop support programs in terms of environmental education through Regional Agency for Protected Areas (RAPAs) in the Vjosa National Park in order to raise awareness at the community level (e.g. by the creation and implementation of a Junior Ranger program), (vii) to Encourage local communities to create a Local Action Group (LAG) as a long-term solution towards sustainable economic development, (viii) to develop joint plans for forest and pastures breeding between institutions at the local and central level. Measures to preserve the environment, ensuring the replacement of the biomass lost due to uncontrolled use of forests, (ix) to improve managerial and law-enforcement capacities serving sustainable management of natural resources and finally (x) to increase necessary capacities of farmers and ranchers in order to inform them about sustainable practices in developing agriculture and livestock through cooperation with the extensive service at the regional directorates of agriculture.

The work on ***Proteced Areas*** has comprehensively examined the protected areas within the Vjosa Basin, highlighting significant challenges and offering insights into effective management and conservation strategies. The Vjosa River, as one of Europe's last free-flowing wild rivers, represents a critical natural asset that requires thoughtful and sustainable stewardship to preserve its ecological integrity, and the myriad benefits it offers to biodiversity and the local communities. To protect and conserve this unique river ecosystem in Europe, a new approach has been taken, based on the creation of the Vjosa Wild River National Park: a more stringent protection regime is being implemented in this protected area, which has its outer limits at the edge of the river channel of the Vjosa and its three largest tributaries or at the edge of the first flood plain. More than 90% of the national park is therefore a 'no-take' zone, in which restrictions also apply to the development of recreation, and especially tourism. All tourist infrastructure, from paths and trails to accommodation, is directed away from the river, to the edges of the valley, so that the river remains undisturbed.

Here, the Vjosa Basin's ecological value cannot be overstated, with its extensive biodiversity and dynamic riverine ecosystems providing essential services such as habitat provision, flood mitigation, and water purification. These ecosystems are irreplaceable and serve as a benchmark for conservation efforts across Europe. The chapter identified several challenges in managing the protected areas effectively. These include integrating freshwater ecosystems into the broader network of terrestrial protected areas, managing land use conflicts, ensuring sustainable funding, and improving stakeholder cooperation. The complexity of these challenges necessitates integrated and adaptive management approaches that are responsive to environmental changes and stakeholder needs. Insufficient political will, fragmented coordination across different government levels, and limited stakeholder engagement exacerbate these issues, making it challenging to enforce conservation policies effectively. Additionally, the complexity of the Vjosa River's ecosystem, coupled with the impacts of climate change, requires adaptive management strategies that the current legislative framework may not fully support, thereby complicating conservation efforts and stakeholder collaboration.

STAKEHOLDERS

The insights from 162 stakeholder interviews underlined the need for enhanced engagement and education efforts to ensure that all stakeholders understand the ecological and economic importance of the Vjosa. There is a clear demand for improving management practices, particularly in areas such as pollution control, water resource management, and infrastructure development. Firstly, it emphasizes the need to extend the framework of terrestrial protected areas to include fluvial protected areas to ensure comprehensive conservation of biodiversity. It also recommends the creation and implementation of integrated management plans that consider environmental, social and economic factors to guide the sustainable development of the region. It also proposes the promotion of sustainable tourism, in order to exploit the natural attractions of the Vjosa for economic gain, while preserving its ecological integrity. Finally, continuous research and environmental monitoring are considered crucial to assess the impact of both natural and anthropogenic changes, thereby supporting informed decision-making and adaptive management practices. The ultimate goal should be to maintain the ecological integrity of the Vjosa River while balancing the needs of human development. This requires a commitment from all stakeholders, including government agencies, local communities, and international partners, to collaborate towards the long-term sustainability of the Vjosa's unique landscape.

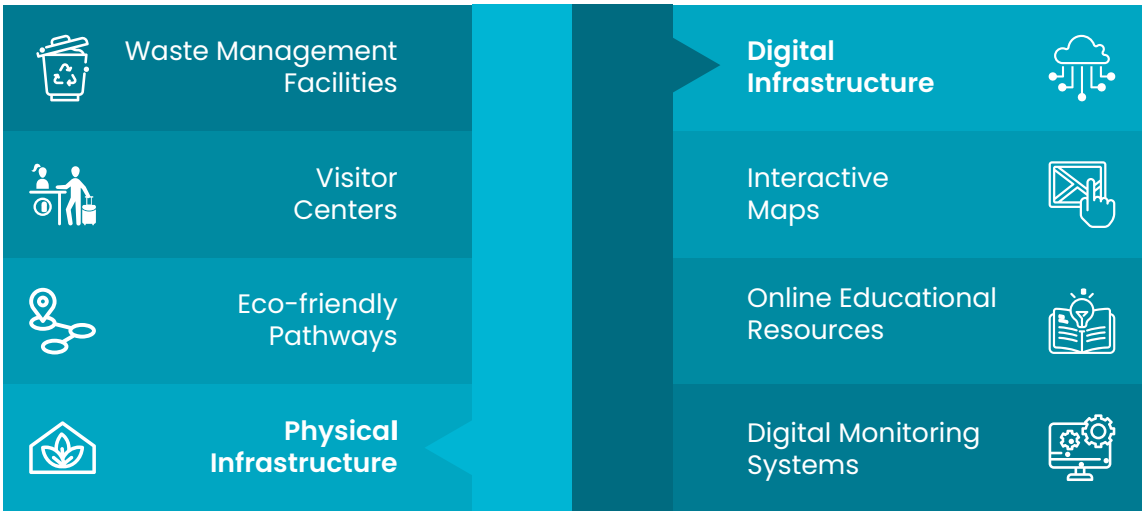
Moreover, it has to be stated, that the amendments to Law No. 81/2017 "On Protected Areas" contradict the European Union (EU) Nature Directives and other environmental legislation on several important points. The introduction of new definitions such as "slightly disturbed natural zones" and "moderately disturbed natural zones", which allow economic activities in protected areas, contradicts the EU's strict requirement that conservation objectives in protected and preserved areas, such as Natura 2000 sites, must take precedence over economic activities. By reclassifying core protected areas into less restrictive categories, the amended law allows potentially harmful activities such as logging, construction work and resource extraction. This is incompatible with Article 6(2) of the Habitats Directive, which requires proactive conservation measures and no activities that harm ecosystems. The new law allows the development of mass tourism infrastructure (e.g. hotels, airports and roads) in key protected areas (e.g. national parks) without the need for a proper environmental impact assessment or justification by overriding public interest, in direct violation of Article 6(3) and (4) of the EU Habitats Directive. The removal of a 50-metre buffer zone around natural monuments and strict nature reserves in the amended law increases the risk of habitat destruction, which is contrary to EU law that requires the protection of critical habitats even outside designated protected areas if they play a role in the connectivity of ecological networks. The reduction in public consultation requirements and the failure to align new site designations and permitted activities with nature conservation priorities are at odds with the EU's requirement for public participation and evidence-based decision-making in nature conservation.

Albania has considerable potential for the development of tourism in general, with the tourism sector identified as a key area for the country's economic development, contributing approximately 20% of GDP by 2023. In the ESPID project, these developments were reviewed and analyzed in the chapter ***Ecotourism***. The development of ecotourism in the Vjosa Valley, which is closely linked to the Vjosa River ecosystem, has been and continues to be, the subject for pressures originating from human activity. These pressures have been identified to have the potential to disrupt the balance between conservation and protection of the ecosystem, whether on legal grounds (for example, the recent change in the Law on Protected Areas or the construction of the Vlora airport), or on informal ones, such as industrial and agricultural activities without the license requisite.

The Vjosa has also played a pioneering role in the development of ecotourism, with the concept of strictly protecting and discouraging visitor pressure on the river (within the boundaries of the National Park), instead highlighting the values of nature, recreational, cultural and culinary tourism in the wider Vjosa valley through a river basin-wide tourism plan.

It is not possible to engage in ecotourism without a protected and properly managed ecosystem. As it was and is widely acknowledged, the development of ecotourism in the Vjosa Valley is still in its infancy. To facilitate the sustainable growth of this sector, while simultaneously reducing the potential negative impact of tourism on the surrounding environment, this study proposes to establish an effective organisational and coordinating structures between central and local institutions. When central and local legislation aligns with ecotourism objectives, it establishes a unified framework that enables effective action, resource allocation, and enforcement. Such coordination can streamline policies around protected areas, sustainable land use, and responsible tourism practices, ensuring that development aligns with environmental conservation.

However, as seen in debates on legislative amendments for protected areas, alignment often remains more rhetorical than actionable. To move beyond proclamations, central and local institutions need to establish clear roles, responsibilities, and mechanisms for collaboration. This could include joint committees, regular policy reviews, and shared data platforms, which foster accountability and consistent implementation. Through cohesive organizational structures, ecotourism efforts can become more grounded, impactful, and sustainable, directly benefiting both the environment and local communities. The study also highlights the importance of infrastructure development - both physical and digital - for fostering a sustainable relationship between people and nature. Stakeholders are increasingly emphasizing the need for projects that support tourism growth while prioritizing environmental conservation.



On the physical side, building eco-friendly pathways, visitor centers, and waste management facilities can improve accessibility without compromising natural landscapes. Meanwhile, digital infrastructure, such as interactive maps, online educational resources, and digital monitoring systems, can enhance visitors' experience and awareness, encouraging responsible tourism.

Digital tools can also help monitor visitor numbers, manage traffic in sensitive areas, and provide real-time data for resource management. Balancing these infrastructure developments with environmental impact reduction will require innovative, low-impact construction techniques, careful site planning, and community involvement to ensure that projects benefit both the environment and residents. Environmental pollution (especially in the lower course of the Vjosa River) is a pressing issue with far-reaching implications. Beyond the direct impact on tourism, which requires intervention at both central and local government levels, the contamination affects the river's ecosystems and the health of communities relying on it. Pollution harms the appeal of the area as a tourist destination and its role as a vital ecological corridor. Addressing this issue comprehensively will likely require coordinated policy measures, improved waste management practices, and community engagement to restore and preserve the river's ecological integrity.

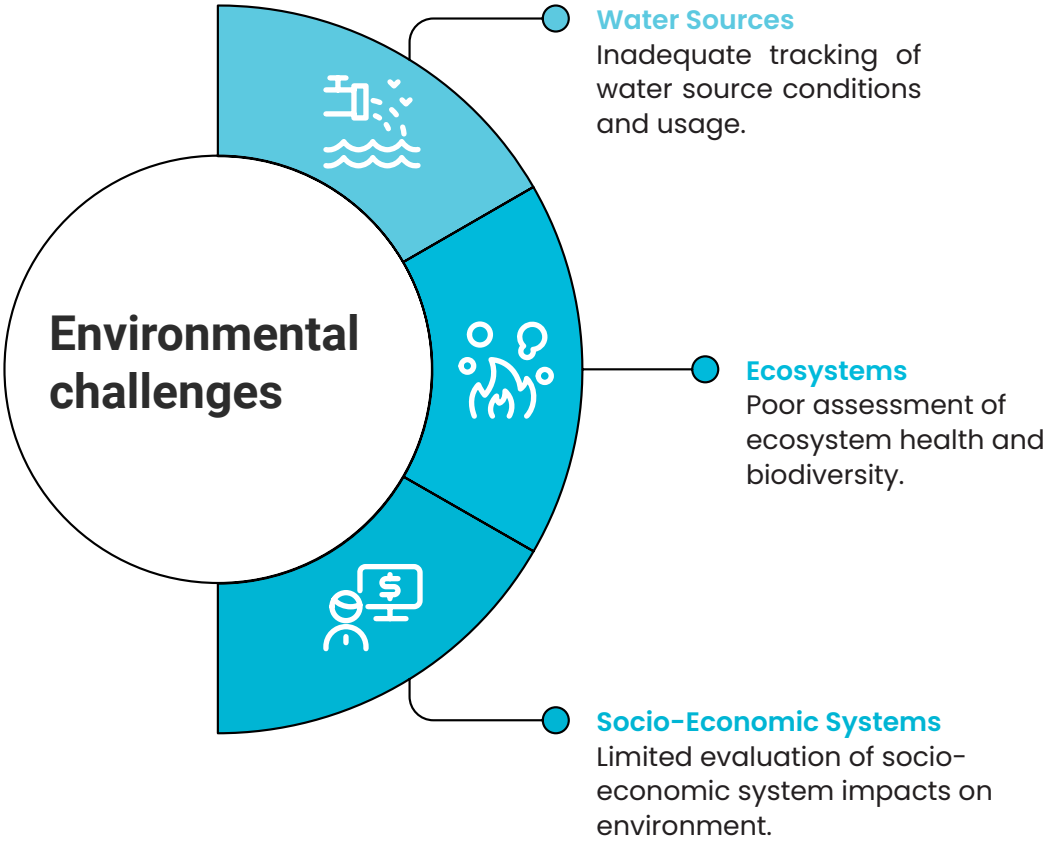
Raising awareness among the local population has been recognized as crucial for protecting the Vjosa River ecosystem, as it encourages sustainable practices that benefit both the environment and the community. Highlighting the natural values of the area - its biodiversity, clean water resources, and natural beauty - can foster a sense of pride and responsibility among residents. By informing the community about the positive impact of a healthy ecosystem on social well-being and public health, awareness campaigns can help people see beyond the immediate economic benefits of tourism. Leveraging diverse information channels like TV, social media, and community events can effectively reach different segments of the population, ensuring a broad and inclusive approach to education. Such efforts can create behavioural changes that not only improve environmental stewardship but also build a community culture cantered around the preservation of natural resources for future generations.

Moreover, establishing a comprehensive registry of accommodation structures, alongside creating extensive databases on natural resources and their evolution, would indeed be valuable for both environmental management and research. By systematically tracking accommodation sites, visitor numbers, and their impact on natural resources, authorities can better understand the relationship between tourism and environmental change. For researchers, such data would provide a clear, scientific foundation for studies on environmental impact, conservation efforts, and sustainable development. This information could also support science-based policy decisions, helping to mitigate environmental degradation while promoting responsible tourism.

Nevertheless it must be stated, that the Law on Tourism (No. 93/2015) and the Law on Protected Areas (No. 81/2017, now amended) do not have a consistent approach to the integration of tourism development and nature conservation. The Tourism Law does not define what types of tourism should be promoted in sensitive natural areas, which means that there is no legal distinction between ecotourism and mass tourism in the legislation. As a result, large hotels, resorts and infrastructure projects are permitted in sensitive ecosystems, including coastal areas, national parks and wetlands. Permitting the construction of five-star tourism infrastructure in the core zones of protected areas may conflict with the objectives of the EU Birds and Habitats Directives.

Tourism planning is top-down and often driven by foreign investors and large companies rather than local needs. As a result, sustainable agriculture, cultural or community-driven tourism and other forms of small-scale use of natural resources are being replaced by mass tourism development. The legislation on tourism and protected areas does not set limits on the density of hotels/resorts, the construction of roads or tourism infrastructure in sensitive ecosystems.

In the last chapter ***Climate change,*** it was figured out that the Vjosa Basin in Albania is highly vulnerable to the adverse impacts of climate change, reflecting broader global and Mediterranean trends. The ESPID projet identified the region's challenges, proposes management responses, and offers actionable recommendations to address the impacts of climate change effectively.



Environmental challenges include insufficient monitoring of water sources, ecosystems, and socio-economic systems to assess the effects of climate change, as well as the increasing frequency and intensity of flash floods and droughts. Agricultural practices and biodiversity are particularly vulnerable to climate variability, and there is inadequate planning for future risks in the Vjosa River Delta, where biodiversity loss, land use changes, and erosion remain critical issues. Social challenges arise from a lack of public understanding and engagement in addressing climate change, limited adoption of alternative livelihoods such as agro-tourism and resilient farming, and inadequate community awareness of climate-related health risks like heatwaves.

Institutional and policy deficiencies exacerbate the situation, including fragmented and outdated climate adaptation plans at both local and national levels, limited integration of climate change strategies into broader policies, and insufficient training of public administration and experts in climate adaptation and mitigation. Financial and economic barriers further hinder progress, with inadequate financial incentives and regulatory frameworks to encourage renewable energy and sustainable infrastructure, and over-reliance on vulnerable agricultural sectors, coupled with limited investments in climate-resilient economic alternatives.

To address these challenges, enhanced monitoring systems were found to be necessary to strengthen hydrological and ecosystem monitoring using GIS and remote sensing technologies, alongside collaboration with academic institutions such as the University of Tirana to expand research capacity. Community awareness and education campaigns should be launched, targeting schools and local communities in the Vjosa Basin, with a public communication strategy that emphasizes the benefits of climate adaptation. Policy and legislative updates are urgently needed to revise outdated legislation on urban infrastructure, such as stormwater drainage systems, and align sectoral and cross-sectoral strategies with national climate goals to ensure coherence and effective implementation. Local action plans should be developed for the entire Vjosa Basin, integrating financial instruments such as incentives for renewable energy adoption and sustainable practices, and offering tax reductions and support for eco-friendly construction technologies like pervious concrete. Capacity building and training must focus on equipping local government and environmental agencies with the skills to implement effective adaptation measures, supported by the dissemination of practical, user-friendly manuals on climate mitigation and adaptation. Promoting nature-based and sustainable solutions is also essential, including encouraging agro-tourism as a viable economic alternative to vulnerable agriculture and adopting nature-based solutions for flood management and biodiversity conservation. This integrated approach aims to mitigate climate risks, protect biodiversity, and enhance socio-economic resilience in the Vjosa Basin while contributing to Albania's national and international climate commitments.

As one of the concluding remarks and in addition to the nexus of science-decision-making-civil society the ***ESPID project*** has also contributed to ***building relationships between cross-border actors between Albania and Greece,*** especially at the local level. This exchange constitutes a good basis for improving models of approaches to governance through the adaptation of models implemented by each country. Thus, this report can also serve as a good source of information for the Greek part of the river in terms of undertaking policies that would minimize pressures of cross-border origin. And finally, the involvement of the local community and the promotion of sustainable development are key factors. The promotion of sustainable agricultural practices and the involvement of local communities in conservation decision-making processes have the potential to enhance the efficacy of conservation outcomes.

1

Floods and Flood Risk Management in the Vjosa Basin

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1.1 Introduction

Climate change and socioeconomic developments are increasing the frequency and severity of floods. Flood management is widely recognized as an effective way to reduce the adverse consequences, and a more resilient and sustainable flood management approach has been the goal in recent studies. During the last decade, the trend of flood research has experienced a transition from flood control to flood resilience. The review of the recent scientific studies show that flood research has moved from traditional flood management, which provides mitigation strategies, to flood risk management, which provides an adaptation approach—adjusting mitigation measures, to flood resilience management, which provides a more resilient and sustainable plan to cope with flood disasters. Nature-based solutions (NbS) for flood disasters could focus on using natural processes and ecosystems to mitigate the impacts of flooding, enhance resilience, and improve community well-being. Some key approaches could be: i) Wetland Restoration, ii)Reforestation and Afforestation, iii) Green Infrastructure, iv) Floodplain Restoration, v) Soil Management: Implementing, vi) Natural Buffers and vii) Community Engagement and Education. Implementing these solutions does not only help to reduce flood risks but also enhances biodiversity, protects ecosystems, and improves overall community resilience to climate change. In this report, we also present a detailed overview of the field of flood research, and review the definition of risk, risk analysis methods, flood management, flood risk management, flood resilience, and corresponding implementation strategies. We conclude that integrating the concept of resilience into the framework of risk management is a better approach in future floods management directions. Consequently, appropriate options and decisions prior to disaster, during disaster, and post-disaster will effectively reduce the adverse consequences using the theory of risk, resilience, and sustainability.

This study is based on a detailed bibliographical analysis of keywords, terms and timelines in the research field of the flood research. It provides new insight into the flood research on the Vjosa River Basin (hereinafter VRB), by examining the existing and new data.

1.2 Floods and Flood Risk Management

Disastrous floods driven by partially driven by rapid urbanization and extreme weather events have caused millions of fatalities, and continue to cause tens of billions of dollars of direct economic loss each year. Especially under the background of global warming, such losses will continue to increase in the future, as the intensity and the frequency of extreme precipitation events increases, and the population exposed to water-related disasters rises. Worse still, river flooding, flash floods, urban floods, and coastal floods may occur simultaneously, resulting in serious compound flooding from extreme river flow, heavy rainfall, and storm surges. Identifying the areas at risk of river flooding, urban flooding, and coastal flooding is a complicated process, as the causes of these events might differ. Although it is known that flood risk increases with climate change, population growth and the increase of economic assets, and that risk is dynamic, constantly changing with underlying surface condition changes.

Previous research has shown the urgent need to deal with flood events, and it is essential to develop future flood management strategies to reduce the adverse consequences and cope with more complex types of floods. Many countries have implemented a series of practices to manage storm water, flood disasters, etc. For example, green infrastructure (GI), low-impact development (LID) and best management practices (BMPs) have been implemented in the United States; sustainable urban drainage systems (SUDS) in the United Kingdom; water-sensitive urban design (WSUD) in Australia; and low-impact urban design and development programs (LIUDD) in New Zealand. Perhaps the most ambitious and far-reaching project has been the Delta Programme in the Netherlands, implemented between 2006 and 2015. This project aimed to create "room for rivers" as well as delivering some auxiliary benefits. It was developed to cope with increasingly serious flood disasters as a more sustainable method than the Netherlands' traditional embankment measures, and has been successful in lowering the flood risk. Moreover, the European Union defined the concept of nature-based solutions (NBS) assessed the effectiveness of NBS projects and demonstrated that NBS has positive effects on flood risk reduction and climate change adaptation. However, the lack of long-term observation records for any of these approaches has made it impossible to fully confirm the results. China proposed the concept of the "sponge city" in 2012, which aims to adapt to environmental changes and increase a city's resilience to cope with natural disasters caused by rainfall-induced climate changes. While constructing a sponge city is a long-term process and it will require a high initial investment for construction, previous studies have demonstrated that a sponge city can effectively mitigate urban flooding.

In the history of international exchange and providing standards the International Conference on Flood Management (ICFM) evolved from the International Symposium on Flood Defence (ISFD), whose purpose was to discuss issues related to floods. Changing the name from "Defence" to "Management" reflected the shift of focus from flood defence and control to flood management, between 2000 and 2005; the theme of the first two conferences was flood defence, but by the third conference the theme had shifted from defence to management. From the fourth to the eighth conference the concept of flood management changed from vulnerability-based and risk-based to risk-based and resilience-based. At the ninth conference it changed further, from risk-based and resilience-based flood management to integrated resilience and sustainable flood management.

Albania, located in the western Balkan, is a disaster-prone country. It ranks as one of the countries in the world with the highest economic risk from natural hazards events.

1. During the past several decades, in average, Albania has been hit by about one major geological event per year. The impact of disasters in Albania are significantly compounded by a relatively high degree of poverty, lack of infrastructure maintenance, unsafe building and land use practices, linked to rapid urbanization, exploitation of natural resources (overgrazing of pasture, overexploitation of forests and riverbeds, etc.) as well as some other consequences of the transition from a centralized to an open marked economy. From a geological point of view, Albania is a young and very dynamic territory and is very vulnerable to the geological and hydro-geological hazards as: flooding, torrential rains, river erosion and coastal erosion that cover almost the entire territory. Due to these conditions its average annual losses count for about 2.5% of its GDP

2. Floods represent a very frequent phenomenon in the Vjosa River Basin (hereinafter VRB). Vjosa River is characterized by large floods with flow values varying from 2000 to 3000 m^3s-1 in the upper part to 5000-6000 m^3s-1 in the downstream part. According to the available data, 11 major floods were observed and each of them caused significant damage to private property. Some of the most important ones include the floods of 1860, 1865, 1867, 1868, 1869, 1870, and 1871. But the biggest and most catastrophic floods have occurred in the years: 1971, 1980, 1997, 2015, 2017, and the last one in January 2021, where the floodwaters inundate the floodplain, close to the river mouth for many days. These floods were the most devastating, drowning many livestock, inundating thousands of buildings, and damaging hundreds of business activities, covering entire lagoons and crop fields near the river estuary area.

During the flooding of December 31st, 1970 – January 1st, 1971 the waters of Vjosa/Aoos River overspilled the riverbanks in many places and inundated the villages of Mifol and Novosela. Moreover, the intensive rain fall caused many landslides. In the coastal lagoon of Narta, big quantities of water have been entered, causing high changes in salt, oxygen and sediment regime. However, one of the biggest flooding of Vjosa/Aoos River was the flooding of February 2015. Because of an intensive rainfall (over 150 mm/24 hours) many municipalities and villages were flooded on the VRB. The river flooded almost the entire downstream section of the VRB. The floods caused the damage and sometimes the destruction of 1700 buildings (most of them near to the river bed), 16 schools, 10 bridges, around 300 business activities very destroyed, many livestock's, hundreds of evacuated families and around 13000 hectares of flooded land (most of them were agricultural lands) were the consequences.

According to the gradient and the flood characteristics, almost all the "Vjosa floods" can be labelled as "Flash Floods". Flash floods can have various origins but are primarily associated with extreme rainfall resulting from thunderstorms. The intensity of the rainfall, its location and distribution, land usage, topography, types of vegetation, density of vegetation, soil composition, and soil moisture content collectively influence the velocity at which flash floods may occur and where they might manifest. Another important hydrological feature is that flash floods generally exhibit minimal downstream mitigation / dampening effects (reduction in peak flow). In fact, the opposite may occur. Furthermore, flash flooding unfolds so swiftly in mountainous environments that people often find themselves unprepared. In certain instances, water can rise rapidly, trapping individuals or causing property damage without allowing for adequate protective measures. In the VRB the flash floods are negatively supported due to the impacts of climate change, environmental degradation and increasing urbanization.

Moreover, as a side aspect, but important due to the possibility of replenishing due to flood flows, human activities especially related to poor decisions on river management and natural resource uses such as uncontrolled extraction of sediments from the river bed had and still have a negative impact on the morphology of the Vjosa river bed and its tributaries.

1.3 Policies and Legal Framework

The legal framework on floods and flood risk management is based on:

1. DCM no. 835, dated December 3, 2004 - National Civil Emergency Plan
2. Law No. 45/2019 on Civil Protection
3. Draft on the National Strategy for Disaster Risk Reduction (NSDRR 2023-2030)

According to the NSDRR, the institutions responsible for flood risk management, water inundations and dam breaks are: Ministry of Agriculture and Rural Development supported by the relevant municipalities and District Prefect Institutions, as well as Institute of Geosciences at the Polytechnic University of Tirana (PUT). The Institute of Geosciences is the main actor that detects, monitors, analyses, predicts, distributes and communicates timely warning information about potential floods. In order to strengthen and increase the level of flood risk management, Albania is drafting a Flood Risk Management Plan document consisting of 3 components:

1. Preliminary Flood Risk Assessment that leads to the identification of areas where there is a potential flood risk or where floods are likely to occur;
2. Hazard maps and flood risk maps;
3. Flood risk management plans.

The main objectives for flood protection to be achieved within a 9-year period according to the authors of NSDRR 2023-2030 are:

1. Reduce flood damage to less than 50% of what has occurred in recent years;
2. Rehabilitate and modernize the affected infrastructure and where there is a risk of collapse;
3. Build new protective works where necessary;
4. Train the personnel of the institutions responsible for irrigation and drainage in terms of monitoring, design, construction, and repair of protective infrastructure;
5. Strengthen the flood response capacities of operational forces.

The NSDRR 2023-2030 foresees several Strategic Projects related to floods, early warnings, water floods and dam breaks, a good part of which are also planned in the Vjosa water basin.

1.4 GAP analysis

In general, the risk assessment of natural disasters includes qualitative, semi-quantitative, and quantitative approaches. The result of qualitative assessment is the relative magnitude of natural disaster risk, such as zero risk, low risk, medium risk, and higher risk. The result of semi-quantitative risk evaluation can be expressed as the multiplication of the frequency grade and consequence grade. Quantitative assessment converts the loss result into a monetary value, to obtain an expected loss, such as the expected annual loss (EDA) or the cumulative loss. In order to accurately measure the impact of flood disasters on human societies and economies, flood risk assessment has undergone a change from qualitative to quantitative. According to different research needs, flood risk assessment could choose the research scale (i.e., global, country, basis, city, community). When conducting flood risk assessment, it can be assessed according to different years to observe the characteristics of changes in flood risk over time. In addition, it can be assessed according to specific scenarios, such as different flood return period scenarios, different social development scenarios, and different flood adaptation scenarios.

The most frequently used expressions of risk assessment models is (Figure 1):

Risk = Hazard x Exposure x Vulnerability

Flood risk assessment from hazard, exposure, and vulnerability deals with the relationship between floods and humans. This approach can identify more effective counter-measures from these three components, for disaster risk reduction. Traditional methods include a probability evaluation method based on historical data, comprehensive flood risk assessment, flood risk assessment integrating remote sensing and a geographic information system (GIS), and the Source-Pathway Receptor conceptual model. Nowadays, in the era of big data and the synthesis of integrative flood risk assessment approaches, the risk assessment approach is being increasingly oriented toward scenario-based methods.

A synthesis of flood risk assessment approaches includes the three indicators of hazard, exposure, and vulnerability. A scenario-based flood risk assessment requires 1 a hydrodynamic model and 2 flood damage simulation.

1.4.1 Hydrological and hydraulic models based on hazard analysis

A hydrological model is used to simulate the runoff and confluence process of a watershed. It can simulate the runoff process of rainfall from the source, to obtain the flow processes and flow peak values of different sections of the rivers, but it cannot determine the hydraulic elements of the river or the flood inundation range of the entire watershed. The hydrodynamic model can simulate the evolution of floods and can directly reflect the inundation range and depth of floods in the form of a watershed inundation map, but it cannot simulate the hydrological process from sources such as precipitation, evaporation, or runoff. After coupling the hydrological model with the hydrodynamic model, the flow process of the channel section simulated by the hydrological model can be used as the input to the upstream boundary conditions of the hydrodynamic model, which reflects the runoff change in the basin and the evolutionary process of the flow in the river.

1.4.2 Damage estimation model based on vulnerability and exposure analysis

The damage estimation model is usually adopted to estimate the damage costs of flood disasters. Questionnaire survey and stage-damage functions are two basic methods for conducting flood damage estimations. A questionnaire survey is a reliable method, but is expensive in terms of both funding and time. The stage-damage function method is therefore more widely used than the questionnaire survey, for estimating flood damage.

The stage-damage functions method comprises the following four procedures:

1. Identify exposed elements and collect relevant socioeconomic data;
2. Calculate the exposed asset value in each unit;
3. Build the stage-damage curve according to flood water's inundation depth and the receptor loss rate;
4. Calculate direct monetary damage according the stage-damage curve and asset value in each unit.

A stage-damage curve describes the change of the damage fraction of different receptor types, with the change in the flood inundation depth. However, the relation between inundation depth and damage fraction is uncertain, as it can vary among different regions. It is difficult to measure if the stage-damage curve is used in multiple regions, as this will add extra uncertainty to the modelling process. However, the scenario-based flood risk assessment approach can simulate the dynamic process of flood occurrence and quantitative disaster loss results, but because of its high requirements for basic data, it poses great operational difficulty.

Flood risk management

Flood risk management means minimizing the loss of life and economic damage by flood disasters or reducing the probability, and the adverse consequences, of flooding. Flood risk management includes not only implementing structural measures to reduce the possibility of flooding (reducing hazard) but also using non-structural measures to reduce the amount of assets exposed and the vulnerability of receptors.

The purpose of flood risk management strategies is to achieve four goals:

1. Reduce risk to people and communities
2. Reduce risk to and promote economies
3. Promote ecosystem goods and services
4. Promote social well-being

Some literature have used the three elements of flood risk to provide flood risk management (FRM) strategies, such as reducing the exposure of humans, the economy, and the ecosystem to flooded areas and reducing the vulnerability of those exposed to floods. Other literatures have used a flood risk management (FRM) framework to provide flood risk management strategies (FRMSs), which include flood defence, flood prevention, flood mitigation, flood preparation and flood recovery. At the same time some studies have put forward flood risk management strategies based on the Source-Pathway Receptor conceptual model (Figure 1).

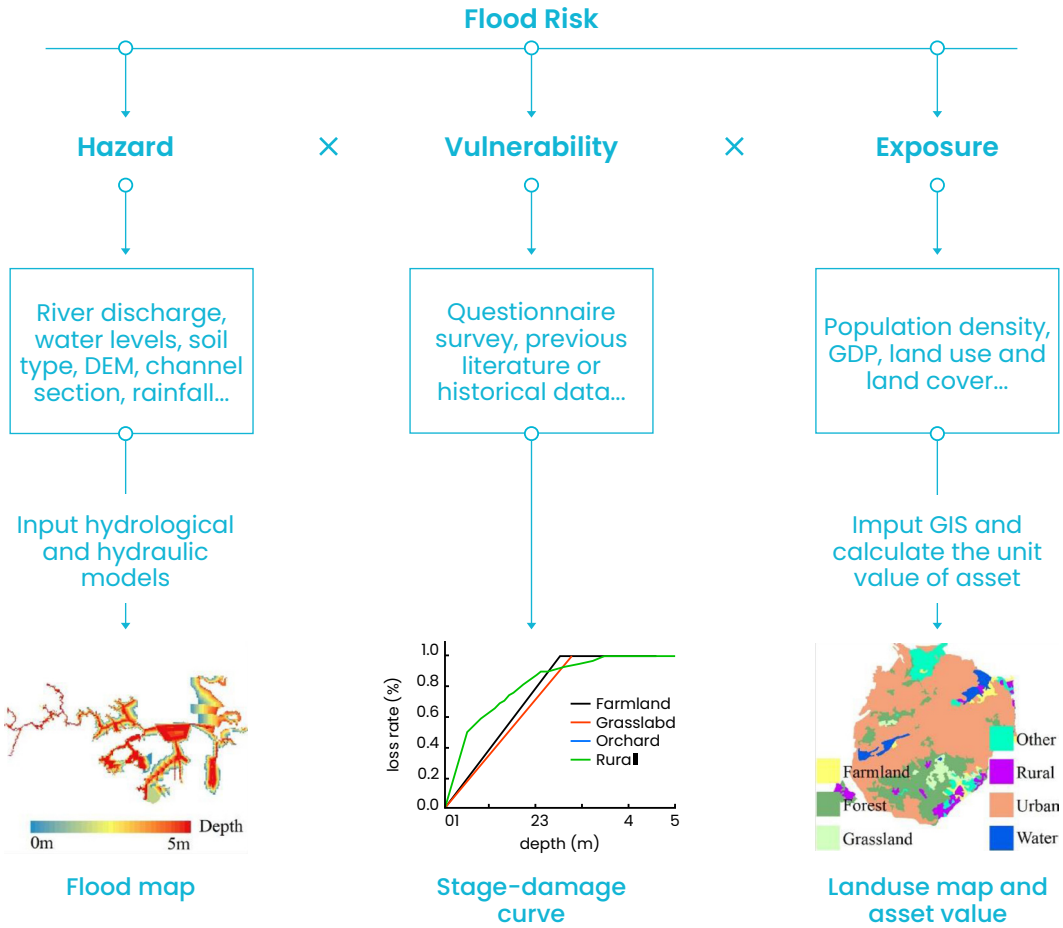


Figure 1: **Framework of simulation-based flood risk assessment approach**

Flood resilience management

Flood resilience

Flood risk is increasing with climate change and socio-economic development. Therefore, current flood risk management measurements are not sufficient to cope with today's flood risk. The concept of resilience has been widely used in recent academic literature and policy documents. Resilience is defined as the ability to bounce back after a disturbance and returning to the previous state, and adaptation is often organized around resilience.

Flood resilience assessment

Flood resilience focuses on building flood resilience indicators and evaluating flood resilience, in the primary literature. The major flood resilience evaluation is based on the semi-qualitative approach, to select the indicator systems or interviews from various dimensions and express the importance of flood resilience. Some studies, based on the methods of analytic network process evaluation flood disaster resilience in the Chaohu Lake Basin, developed an index system for evaluating regional flood disaster resilience, and a flood resilience index system that included five dimensions (nature, society, economy, technology, and management). Some authors evaluated flood disaster resilience based on the hesitant fuzzy linguistic term and pointed out that the flood resilience index system includes five dimensions—nature, society, economy, infrastructure, and management.

Other researchers have evaluated flood resilience based on resilience theory (robustness, rapidity, redundancy, and resourcefulness). Resilience can also be measured by the time a receptor needs, to recover from shock.

Flood resilience management strategies

Many projects have been put forward, that focus on building resilient communities, resilient cities, and resilient coastal areas. The Resilient Communities Project, the 100 Resilient Cities program, and the Sustainable and Resilient Coastal Cities program are examples that have been implemented in various countries. Some institutions and international teams are also building resilient cities. Most flood resilience management strategies use a resilience framework to provide management strategies. The community resilience framework is based on four main components (economic activities, ecosystem services, infrastructure and buildings, and community action) and their sub-categories, to provide detailed resiliency solutions. The framework also defines the characteristics of resilience (aware, diverse, self-regulating, integrated, and adaptive) as detailed indicators, and provides resilience strategies for each indicator. The resiliency solutions could quickly bring infrastructure such as buildings back to its initial (pre-disaster) state, and the community/city could also recover quickly, perhaps even attaining a state better than its pre-disaster one.

In general it needs to be explained; - the difference between infrastructure resilience and community/city resilience. For that, a disruptive event can be divided into three stages:

1 Before disruption 2 During disruption 3 After disruption

When disruptive events occur, infrastructure has four resilience properties, defined as the 4R's: Robustness, Redundancy, Resourcefulness, and Rapidity, and a community/city has five resilience properties: Robustness, Redundancy, Rapidity, Resourcefulness, and Adaptively. The similarity between these two types of resilience characteristics—engineering and community/city—is that the system can experience a disturbance and still retain control of its function and structure. Some infrastructure, such as buildings and roads, etc., is in the domain of engineering resilience. When disruptive events occur, engineering resilience will enable the infrastructure to recover to its initial state within a defined timeline. Communities and cities, by contrast, belong to the category of socio-ecological resilience; after a disturbance, they will reach a new equilibrium within a defined timeline. Because the operation of a city involves human interaction with natural systems, such a system can learn from past disasters and improve its ability to adapt to disasters, establishing a new equilibrium that will be better than the initial state of the resilient city system.

The provided synthesis analysis provides new insight into flood research trends, by examining current research frontiers for Albania, and clearly shows a timeline for flood research. It will help stakeholders understand the advantages of the different strategies of traditional flood management, flood risk management, and flood resilience. The next step for stakeholders is facing uncertain climates, diverting human-induced disasters, and building more resilient communities, cities, and watersheds. This study suggests flood adaptation and mitigation measures along with the integration of the dual strategies of flood risk management and flood resilience, to effectively reduce water-related adversities. Unfortunately, more than half of the Albanian population lives very close to river mouth areas, where the risk of flooding is very high (high discharges and reduced flow velocities and thus lower discharge capacity in the channel). Based on the most recent analysis, it is evident that many areas along the Vjosa River face significant flood risks. Figures 1, 2, 3, and 4 illustrate the most vulnerable zones within the municipalities of Përmet, Gjirokastër, Vlorë, and Tepelenë.

Legend

Large dams, 2021

Westland

Water flow

Stream
Canal
River
Lake
Reservoir

Water flow network

Stream
Canal

Order 3 (Municipal Boundary)

Order 2 (District Boundary)

Areas at risk of flooding

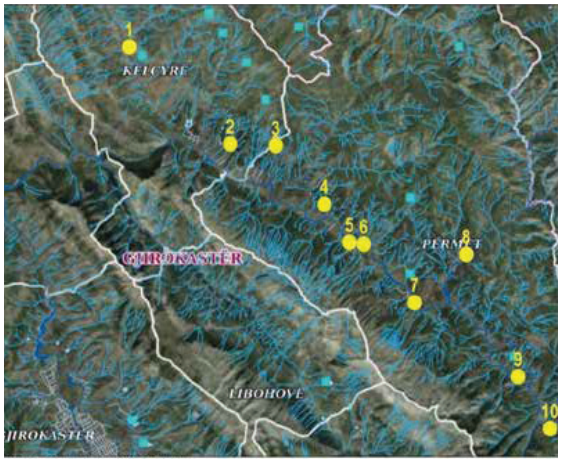


Figure 2:

Flooded area on the Përmet Municipality: 1: Grykabardha Bridge – Dëshnica River, 2. Variboti Reservoir – Shtika River, 3. Pacomi Reservoir, 4. Kosina Village, 5. Pasarela e Buallit, 6. Bus Park of Përmet 7. Bredhi i Badlonjes, 8. Langarica, 9. Dracova Bridge and 10. Carshova.

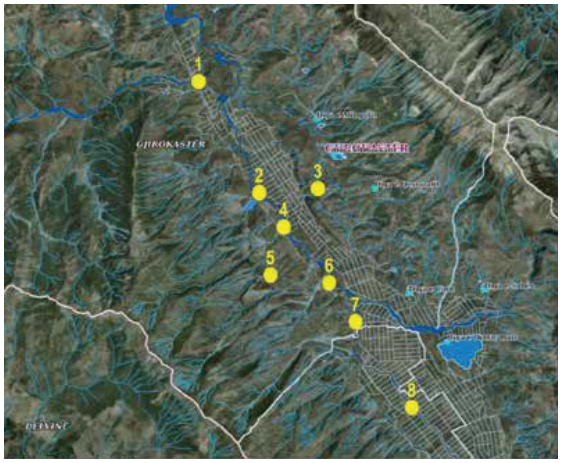
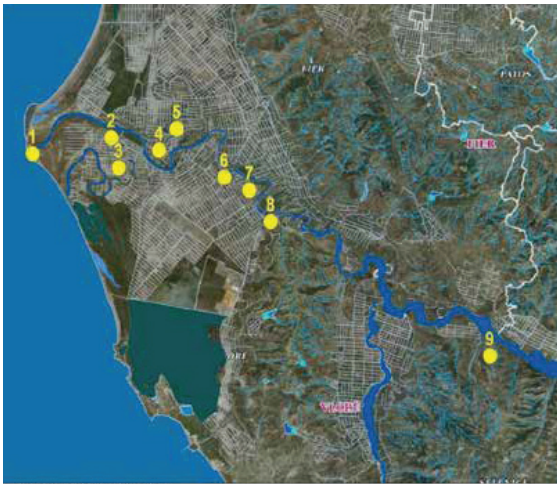


Figure 3:

Flooded area on the Gjirokastra Municipality: 1. Kardhiqi Bridge, 2. Virua, 3. Kthesa e Aznakut 4. Ura e lumit, 5. Përroi i Cullës, 6. Varrezat, 7. Kordhoca and 8. Dropull i Poshtëm.



0 5 10 km

N

Figure 4:

Flooded area on the Vlora Municipality: Selenice section - Adriatic Sea: 1. Delta, 2. Dëllënje, 3. Zhukë, 4. Pishë Poro, 5. Bishan, 6. Fitore, 7. Novoselë, 8. Mifol and 9. Selenicë Municipality. The river mouth, the part where Vjosa River meets the Adriatic Sea, needs cleaning and maintenance to allow the river to communicate with the sea. In this way, the risk of flooding in this sector will be reduced

0 5 10 km

N

Figure 5:

Flooded area on the Tepelena Municipality: Gurëz and Lekli Bridge

Legend

Large dams, 2021

Westland

Water flow

Stream
Canal
River
Lake
Reservoir

Water flow network

Stream
Canal

Order 3 (Municipal Boundary)

Order 2 (District Boundary)

Areas at risk of flooding

1.5 Management response to address the issue

Issue 1

Referring to the NSDRR 2023-2030, there is a need for modernization and rehabilitation of the network of weather stations, regular maintenance of equipment, regular reliable Internet connections, new qualified staff, such as hydrologists and meteorologists, and digitization of data in order to improve the Early Warning System of Albania

Measure 1

Install digital hydro-meteorological stations accessible by all institutions and the increase of technical and operational capacities... In addition, according to the NSDRR 2023-2030, the technical and operational capacities of Albanian institutions for forecasting, monitoring, and warning of hydro-meteorological data are still considered insufficient. The installation of digital hydro-meteorological stations will improve not only flood management and damage prevention but will also help knowing the amount of water passing through the VRB. Climate change will extend already long periods of drought combined with short periods of intense rainfall. Knowledge and correct management of water in the VRB will help in the sustainable development of the areas and in ensuring proper use of land.

Measure 2

The most important aspect would be the data-sharing. All the previous hydro-meteorological data, together with the new data obtained from the new hydro-meteorological stations have to be publicly available without any restriction, especially for the research institutions. The data could be managed and provided by a responsible institution, like IGJEO. According to the NSDRR 2023-2030, some of embankments need repair rehabilitation, or resizing due to the destruction and natural erosion that have occurred in recent decades.

Issue 2

Long-term solution for safety and sustainable development

Measure 1

To ensure safety and sustainable development, it's essential that planning, land use, and people's actions take into account the potential flood risks. The main long-term solution consists of keeping urban areas outside the river floodplain. While land use planning for flood risk reduction has been extensively discussed in the literature, there is still a notable absence of a well-defined approach for flood-mitigation-focused land-use planning and its execution in Albania. A lack of hazard-informed land use planning coupled to random land cover pattern evolution characterizes the country. An important aspect of Disaster Risk Reduction (DRR) is the implementation of risk-based land-use planning and regulations to reduce the underlying causes of disasters and their resulting losses. The integration of DRR in urban land use planning has to be set as a priority action. Land use planning plays a crucial role in safeguarding infrastructure and assets, with land use planners promoting the construction of resilient buildings away from flood-prone areas to advance community safety.

Measure 2

Deforestation is a major problem causing increased erosion, especially in fragile geological formations such as Flysch; composed by sandy and clay formations. This contributes to the loss of several hectares of land, which could be well used for agricultural purposes and for livestock farming. The lack of forests and vegetation on the slopes along the Vjosa valley means that in case of intense short-period rainfall, which is also enhanced by climate change, the entire amount of rain water reaches the main stream of the Vjosa river within a very short time. The surface waters, which have encountered no resistance on the slopes, will significantly increase the number of downstream flows creating frequent and increasingly larger floods of Vjosa River in the future due to climate change.

In this chapter the possible and needed management responses based on the gap analysis are presented for the topic floods and flood risk management in the Vjosa basin.

Issue 3

Coordination and collegial decision-making at the local and national level

Measure 1

Ensure coordinated management of water discharges, canals, rivers, and water-related structures, which is currently often shared between many institutions and authorities. Coordination and collegial decision-making at the local and national level is essential for establishing quantifiable benchmarks for problem resolution. Additionally, effective information sharing and early notification measures are vital for mitigating and, in some cases, preventing flooding resulting from water accumulation at elevated levels.

Measure 2

Coordinated information dissemination and the implementation of a public information strategy are of utmost importance for safeguarding lives and properties in high-risk regions.

Issue 4

According to the NSDRR 2023-2030, some of embankments need repair rehabilitation, or resizing due to the destruction and natural erosion that have occurred in recent decades.

Measure 1

Ensure regular maintenance of secondary or tertiary canals, and the assessment of stability as well as reinforcement and monitoring of dams, ditches, embankments, etc.

Issue 5

University curricula

Measure 1

Other key measures include: developing university curricula related to river basin management and flood risk reduction; collaborating with neighbouring countries to address flood management; and enhancing the theoretical knowledge of local government staff in areas such as water resource management and flood risk reduction

2

Water Supply and Wastewater Treatment

Prof. Assoc. Klodian Muço,
University Our Lady Of Good Counsel

Executive summary

This technical report on water supply and wastewater treatment along the Vjosa River Basin has been prepared within the framework of the ESPID4Vjosa Programme, implemented by Euronatur and EcoAlbania, with financial support from the Austrian Development Agency (ADA). The objective of this study is to evaluate the current condition of the Vjosa River ecosystem and to identify the factors that contribute to its deterioration. The study focuses on water pollution, with the objective of identifying the principal sources of pollution and proposing concrete measures for the rehabilitation of the Vjosa River and its protection as one of Europe's most significant ecosystems. The preservation of the ecosystem in the Vjosa River Basin has a beneficial impact on a number of levels, including the natural and environmental aspects, as well as the socio-economic aspects.

The Vjosa Valley, which is home to over 1,000 plant species and 200 animal species, is facing the threat of water pollution. The pollution, predominantly caused by industrial and agricultural activities, has the potential to destroy habitats and render the Vjosa River water unfit for human consumption, which would ultimately result in the extinction of numerous endangered species and jeopardise the overall ecological balance of this invaluable region. Furthermore, it raises concerns about the sustainability of its valuable ecosystem services, including the provision of drinking water, climate regulation and support for tourism. The contamination of water resources is a significant threat to the provision of essential services, with considerable adverse implications for the economic stability and quality of life of local communities.

A review of the data from local entities situated along the Vjosa River Valley reveals that the municipalities in question face significant challenges in terms of financing the construction and maintenance of wastewater treatment plants and solid waste management facilities. It is therefore evident that investment from central public entities is required. Notwithstanding the progress has been made in identifying and allocating funds for the construction of wastewater treatment plants in the Vjosa River Valley; however, the commencement of these allocations has yet to occur. The failure to timely resolve the problems of wastewater pollution and water supply may have significant costs for residents living along the basin.

These include increased health expenses resulting from pollution, as well as a loss of income from tourism. The latter is driven by the degradation of the ecosystem, which drives away tourists and reduces income from this important sector of the country's economy. The contamination of water resources and their subsequent use in agricultural practices can result in soil contamination, which in turn can affect crop yields and the health of animals used for milk and meat production.

Furthermore, pollution can have a detrimental impact on fish populations, leading to a reduction in fish catches and consequently, a negative effect on the local fishing industry. In order to address these challenges, it is recommended that significant investments be made in the construction of wastewater treatment plants and in the implementation of improved systems for the collection and treatment of solid waste. It is similarly recommended that the legislation pertaining to the provision of water to residential areas and the utilisation and discharge of wastewater from agricultural and industrial sources into rivers should be subject to review. It is recommended that efforts be made to enhance collaboration with the local community, with the objective of pursuing ecologically sustainable economic development. In conclusion, this technical report on water supply and wastewater treatment along the Vjosa River Basin identifies shortcomings in the institutional framework and suggests measures that can be implemented by central and local institutions, academia, and local government along the valley in question.

2.1 Introduction

The Albanian landscape is characterised by a dense network of rivers, which exhibit a high flow rate. They are part of the Adriatic, Aegean and Black Sea water basins. The country's rivers have their source in the mountainous eastern half of Albania and flow westwards along the coastline to the sea. The rivers are fed by the melting of snow from the country's numerous snow-capped mountains or by heavy rainfall that falls at higher elevations. The country's river system is comprised of eight principal rivers and their numerous tributaries. The water resources of Albania are distributed across seven hydrographic basins, all of which flow in a west or north-west direction throughout the country. The main river systems, from north to south, are as follows: he principal rivers of Albania are the Drini-Buna, Mati, Ishem, Erzeni, Shkumbini, Semani and Vjosa (Gjeras, & Veliu, 2017; Bogdani, & Luga, 2004). The management of water basins in the Republic of Albania is a highly intricate process, which is conducted through the coordination of a multitude of organisational structures, spanning from the central government to the local authorities.

The Water Resources Management Agency (a government agency that reports to the Prime Minister) is the body responsible for the management, organisational coordination and control of the application of the water basin management plan. Other relevant bodies at the local level include the Water Basin Council, which is responsible for the integrated management of water resources in the relevant basin, including the conservation and protection of water resources, as well as the equal distribution of water resources within the specific basin, and the Water Basin Administration Office, which is responsible for the preparation of resource management plans for the respective water basins and the maintenance of inventories for water resources. Despite Albania's abundant water resources and recognition of water as a vital element for life, the country's waste and pollution levels are evident in its rivers and lakes. These include water losses in the distribution network and water pollution from various types of waste, including organic, chemical, and solid.

Water pollution in Albania is a significant environmental concern, stemming largely from industrial discharges, urban wastewater, agricultural runoff, and waste mismanagement. The country's rapid development over recent decades have not been matched by adequate environmental infrastructure, leading to several specific water quality challenges across region. Industrial pollution of rivers has been observed in the rivers of Shkumbini, Fani, Gjanica and Semani, where toxic organic compounds and metals from mining and industrial activity are heavily affecting these rivers. The waste management system is composed by a weak collection system in cities and very little collection systems in rural areas. According to European Environment Agency, approximately 70% of the population was served by waste collection services in 2019, mainly in urban areas. In 2019, only 60 % of the waste generated was collected for treatment, corresponding to 70 % of the population covered by waste collection services. The main system for waste collection in Albania consists of 'bring points' for residual (mixed) municipal waste, where citizens take their waste for collection. The little streams and tributaries usually serve as waste disposal for the small villages. Where no waste collection service is provided, people often dump waste at roadsides or burn waste in the open and by the riverbed most of the time this is the situation especially along the Vjosa river. Albania has quite a low recycling rate, resulting in informal waste pickers collecting waste from dumpsites and bins.

Separate collection for recycling is not common, and there are no clear enforcement mechanisms supporting separate collection and recycling. It is estimated that approximately 10-18.5 % of municipal waste is collected for recycling, mainly by informal waste pickers, who collect waste from dumpsites and bins and then sell it to the recycling industry. This activity is, however, not legal in Albania and there are no plans to formalise these collectors. The waste pickers are mainly from the Roma community and are mostly unequipped and untrained workers, who are exposed to hazardous materials. These people, in general operate under unsafe conditions and informality. The reported collection rates of the informal sector are estimated to be quite high, but these might decline a bit once better data on recycling rates become available. At the sanitary landfills (Bushati-Shkodra, Maliqi-Korça, Bajkaj-Vjosa valley, and Sharra-Tirana) and the incinerator of Elbasan, permanent workers are employed to pick out the recyclables from other waste types. In other landfills and dumpsites, there are similar activities performed by the informal sector. Private companies engage in recycling plastic, metal, glass, and paper waste, processing and packaging it before exporting these materials to other countries. The rest is mostly landfilled.

Awareness on waste recycling is low and littering and waste dumping remains a serious problem in Albania: Albania's recycling industry, represented by the Albanian Recyclers Association, includes 32 private recycling companies employing 1,249 people, with an industry market value of approximately EUR 234.2 million as of 2021 (European Environment Agency). These companies have a significant processing capacity of around 498,480 tonnes per year, which exceeds the total volume of recyclable waste generated in Albania. However, despite this ample capacity, the current recycling volume in Albania is only around 133,592 tonnes annually. This indicates a considerable gap between potential and actual recycling activity, driven by a range of factors (limited collection and sorting infrastructure; low public awareness and engagement; informal sector; policy and regulation gaps).

The rivers/freshwater ecosystems in Albania have also been negatively affected by waste. Water, being a source of economic development in river valleys, it is essential to support the agriculture, livestock, fisheries and fish farming as well as the basis for the development of truism and recreation. The sustainable use of water is considered obligatory for the enforcement of the sustainable development principles. It can also be the basis for prohibiting migration and depopulation of the country's peripheral areas due to its strong linkage with the development of the small local economies: pollution from sewage flowing into the river, disposal of solid materials or the use of inert materials can turn into a heavy cost for the valley, compromising the health of the community and its natural values (EcoAlbania, 2024). This situation, as already mentioned, can be seen in all Albanian rivers (main and secondary branches): Drin, Shkumbin, Seman, Vjosa, Erzeni, etc. Consequentially the irresponsible use of natural resources (land, water, forest, mineral, etc. and climate changes are accelerating the environmental and nature degradation as well as the dramatic changes on natural processes such as long droughts in the summer and intense floods in winter.

According to specialists' data, around 21% of the forests in Albania (or about 200,000 ha of forest) are at an advanced degree of degradation. (Lireza & Lireza, 2014). The abandonment of degraded or deforested lands, particularly in mountainous areas, has serious consequences for the activation of erosion, even years after the initial land disturbance.

2.2 Context Analysis

Referring to the National Environmental Monitoring Program 2021, there are three strategic documents for water management whose primary purpose is to ensure an integrated and functional management of water resources, establishing monitoring and management systems for risks from floods and insufficiency of water resources. There are currently 38 monitoring stations in the country's main rivers, of which 5 are in the Vjosa River Basin (Figure 6).

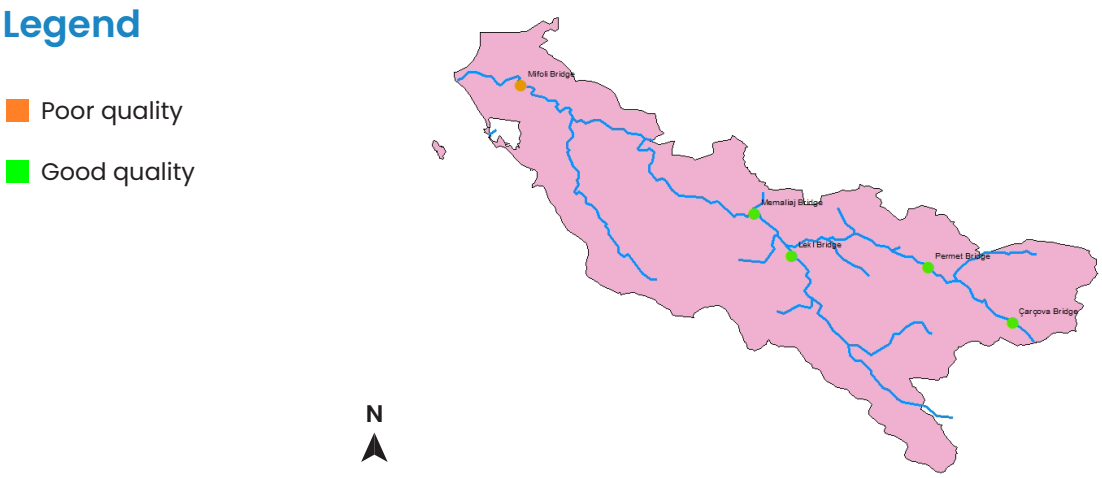


Figure 6: **Monitorings stations Vjosa Basain**

The results of the monitoring shows that the waters of the Vjosa River have a good quality. In terms of economic aspects, referring to the data of Instat (2022) and the study of Muço (2020), there are about 25 commercial activities in the valley of Vjosa with the river water or riverbed being their primary resource (aquaculture and inert materials collection points) and dozens of other businesses focused on agriculture and farming that are closely linked to the river water. Further, there are several drinking water sources in the Vjosa valley that are used by residential areas, which are managed by the municipalities (Table 1). The real challenge of water use is the management of water used for irrigation, where water is often considered as common good, and pollution and exploitation of water resources are not taken into consideration.

Referring to the decision of the Council of Ministers No. 550, dated 15.07.2020, point 2a and 7, the authority responsible for issuing permissions for the use of water is the Water Basin Management Agency (AMBU in Albanian). Today, the Vjosa river is threatened by public or private activities that use it for solid waste disposal, sewage discharge, discharge of polluted water from aquaculture activities, as well as for the operation of inert material collection points. Municipalities such as Tepelena and Përmeti fail to separate rainwater from wastewater, while most of the municipalities along the Vjosa River use the riverbanks as solid waste disposal points.

There are also several other businesses such as paint production, slaughterhouses or shoe production which dispose of their wastewater into the Drino River (a tributary of Vjosa River) without treating it first. Their cumulative effect threatens the quality of water resources and the living organisms in it. Another problem remains the scarcity or lack of sewage systems and urban water treatment plants, with infrastructure in most municipalities being missing or poor. Sufficient sewage coverage in the municipalities along the Vjosa valley is from 0 % in Libohova e Këlcyra to 81.6% in Kolonja.

Table 1: **Water Supply and waste treatment in municipalities along Vjosa River**

Municipality	Water Supply coverage (%)	Sewage coverage (%)	Solid waste coverage (%)
Kolonje	100	81.6	83
Fier	68.1	46.6	85
Mallakaster	77.5	21.6	65
Vlore	90.8	63.3	97
Selenice	74.4	6.6	49
Himare	91	18.3	70
Gjirokaster	100	40.3	83
Tepelene	76.8	48.5	61
Kelcyre	46.7	0	36
Permet	95.7	68.6	60
Libohove	100	0	50
Dropull	100	1.7	97
Memaliaj	51.4	31.9	37

Source: National Environment Agency, 2021

As the Vjosa valley is increasingly becoming a tourist destination, it is crucial for the community to address issues such as water pollution, riverbed damage. The revision and enforcement of legal regulation of water treatment for economic activities, must align with the EU standards and regulation. This includes finding solutions for the treatment of sewage from the municipalities of the Vjosa valley.

2.3 Policies and Legal Framework

2.3.1 National Legislation

The Government of Albania, focused on EU integration as its objective, has worked to harmonize the legislation with the EU legal framework, and intends to establish clear responsibilities for the implementation of the EU *Acquis*. Therefore, in the field of water monitoring, there has been progress towards the transposition of the EU Water Framework Directive (2000/60/EC), such as the Albanian water administration, Law No. 9115, dated 24.7.2003, "On the Environmental Treatment of Polluted Waters" that aims to protect the environment and human health from the negative impact of polluted waters, also setting rules for environmental treatment and obligations for polluters. Through the approval of the national Law no 29/2024 "On Water Resources" the National Agency for Water Resources Management is the institution responsible for the management, provision, and rational use of water resources as well as for the development and implementation of management plans. The adoption of the decision of the Council of Ministers (No. 662), dated 21.09.2016 "On the approval of fees for the extraction/use of water and liquid discharges" is considered part of the progress of the national water administration (Figure 7).

From these Laws and the decisions of the Council of Ministers, it can be observed that Albania has a relatively complete legal framework, but the implementation and enforcement of legality by public and private institutions is still a challenge. For this purpose, it is necessary that the primary legislation (law) be enriched with the secondary legislation (directives and instructions) to enable the effective implementation of the legal objectives. Municipalities under the law no. 139/2015 "on the Local Governance" are obliged to fulfil the services of water supply, wastewater treatment as well as solid waste management and rural development. Articles 23, 26 and 27 of this legislation place particular emphasis on the role of the country's municipalities in the production, treatment, transmission and supply of drinking water. Furthermore, municipalities are obliged to collect, remove and treat polluted water and rainwater in the event of flooding. Concurrently, municipalities are accountable for the maintenance of water quality and the infrastructure utilized for the administration and utilization of waters under their purview, as outlined in Articles 26 and 27.

In the Vjosa valley, likewise in all the country the municipalities are the responsible to guarantee the water supply to the residents with drinking water. In addition, the municipalities are also responsible for the treatment of wastewater and sewage. A lack of financial capacity and resources to build the necessary infrastructure for the collection and treatment of urban wastewater, makes it impossible to adequately treat water for all municipalities situated along the Vjosa Valley. If municipalities are responsible for water supply and the treatment of polluted water at the local level, law no. 29/2024 identifies the organizational structures, which will deal with the management of river basins, at the central and local level, which are: Council of Ministers, National Council of Water (central level), Water Resources Management Agency (central level) , Water Basin Council (basin level - local), River Basin Administration Office (territorial branch of the Water Resources Management Agency).

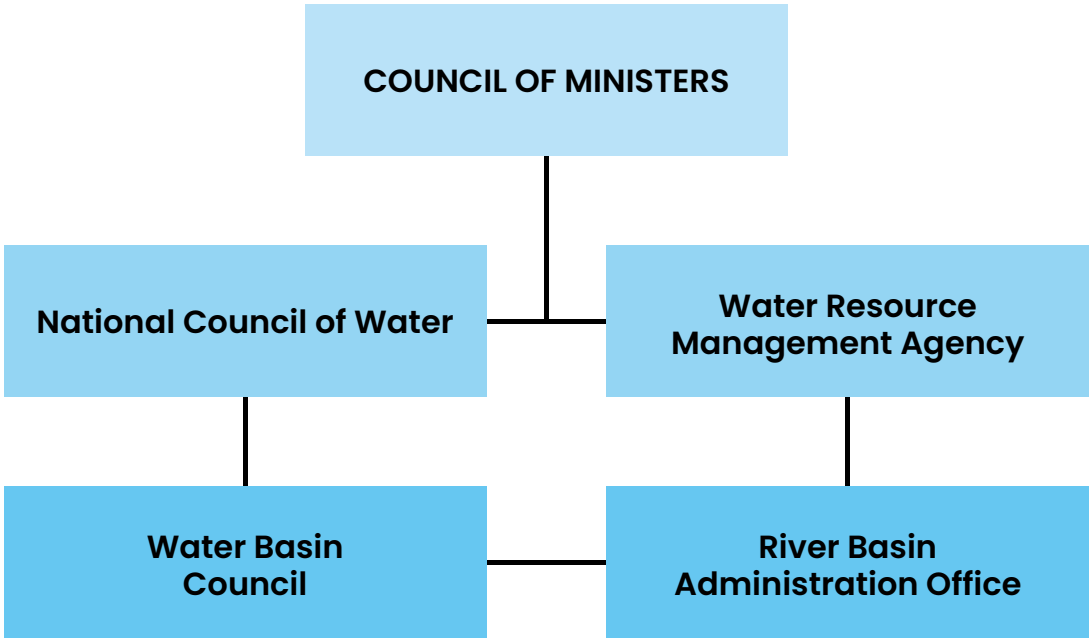


Figure 7: **The administrative organisation of water management in Albania**

The Council of Ministers approves the composition and operation of two central bodies: the National Council of Water and the Water Resources Management Agency, as well as the integrated management strategy of water resources and river basin management plans. The National Council of Water is the central decision-making body, responsible for the administration and management of water resources. The National Council of Territory and Water is a collegial body chaired by the Prime Minister and dealing with issues of administration and management of water resources. The Water Resources Management Agency is a public legal entity that is financed from the state budget and any other legal source. The Water Resources Management Agency is organized at the central level and at the river basin level through river basin administration offices.

The Water Resources Management Agency designs and implements policies, strategies, plans, programs and projects aimed at the management of water resources, quantitative and qualitative preservation, as well as their further consolidation; draws up river basin management plans, flood risk management plans or plans, programs and other management instruments defined in the provisions of this law; ensures the coordination of the provisions of this law in relation to the fulfilment of environmental objectives and especially of programs of measures with other authorities.

The River Basin Council bears the responsibility for the management of water resources within the defined river basin. The River Basin Council is responsible for ensuring the optimal conservation and utilisation of water resources within the defined river basin, in accordance with the management plan for that particular basin. It also ensures the fair distribution of water resources within the river basin, according to their intended use, as well as their efficient management and administration, in accordance with the management plan for that river basin. Furthermore, the Council ensures the protection of water resources from pollution, misuse and damage that could affect their quality and quantity.

ADD the Institutional Framework.

2.3.2 EU Water Framework Directive

The European Parliament and the Council of the European Union enacted Directive 2000/60/EC on 23 October 2000, thereby establishing a framework for Community action in the field of water policy. Since 2000, this directive has constituted the primary legal instrument for the protection of water resources in Europe. The directive applies to inland, transitional and coastal surface waters, as well as groundwater ensuring an integrated approach to water management, respecting the integrity of whole ecosystems. This is achieved by regulating individual pollutants and setting corresponding regulatory standards. The directive is based on a river basin district approach, which ensures that neighbouring countries cooperate to manage the shared rivers and other bodies of water. The directive requires that Member States utilise their River Basin Management Plans (RBMPs) and Programmes of Measures (PoMs) for the protection and, where necessary, restoration of water bodies, with the objective of achieving a good status and preventing deterioration. The term “good status” denotes both a favourable chemical and ecological status. The directive represents a foundational document in the Albanian context, providing a framework for the formulation of river basin management plans at the national level.

2.4 GAP analysis

2.4.1 Current situation and issues

Vjosa Water flow regime

The annual water flow in the Vjosa basin shows continuous fluctuations due to climatic and physical-geographical factors. These fluctuations have a cyclical nature and deviate from the multi-year average value. Without human influence, the fluctuations in annual flow are considered random variables. Rainfall is the primary form of precipitation in the Vjosa basin. Snowfall in the upper region increases groundwater reserves that feed surface flow, particularly during dry periods. The flow regime in Mifol is significantly affected by the tide phenomenon, especially in rivers with lower flow. In the Vjosa basin, groundwater sources vary between 30.3% to 30.8% of the water volume, while surface sources from 69.2% to 69.7% of the total water volume (Korançe & Shallas, 2021).

Incidence of floods and related consequences

Flooding is a crucial aspect of the sustainability of the Vjosa River due to its long-term environmental and socio-economic impacts. The floods of the Vjosa have not only affected the areas around the riverbed but have also caused erosion. in the Municipalities of Fier, Vlora, Selenica and Dropulli (Korançe & Shallas, 2021). During periods of high flow, the Vjosa River overflows its banks and floods the surrounding areas, particularly in the municipalities of Fier, Vlora, Selenica, and Dropulli. The indicator of the maximum discharge capacity, which has become frequent and the main problem for flooding in this river reaches up to 5500 m3/sec in 2016. The minimum multi – year flow in the Vjosa River was calculated at the Mifoli Bridge, reaching 54 m^3/sec, while the maximum flows were recorded at 2,700 m^3/sec at the same location. Meanwhile, the annual average flows are calculated at approximately 200 m^3/s (Korançe & Shallas, 2021). This capacity depends on the conditions of the plot's formation and is divided into two groups: in meteorological conditions (intensity, duration, distribution of rain in the basin) and in morphometric characteristics of the basin, which are invariable for a given basin. Among these two groups, the first one plays a formative role, while the second group affects the change of whole parameters. The maximum floods in Vjosa are mainly caused by the rains, they usually form during the November-March period.

Surface water quality

In accordance with the provisions set forth in DCM No. 1189, dated 18/11/2009, which delineates the rules and procedures for the drafting and implementation of the national environmental monitoring program, the National Environment Agency is responsible for monitoring the quality of surface waters in Albania, encompassing rivers, lakes, and coastal areas. Additionally, the Agency assesses the impact of urban liquid discharges on water quality. The Laboratory of the National Environment Agency is responsible for conducting monitoring on a quarterly basis, with the resulting data being incorporated into the State of the Environment Report, as well as into information disseminated at the local, national, and international levels. Additionally, the data is utilized in reports submitted to the European Environment Agency.

The monitoring network has been expanded to encompass rivers, lakes and coastal areas. The quality of rivers and lakes is assessed based on physico-chemical parameters, with comparisons being made with the permitted rates defined in the EU Water Framework Directive. The quality of surface waters is assessed using a range of indicators, including water temperature, transparency, pH, alkalinity, salinity, electrical conductivity, dissolved oxygen, NKO, NBO5, nitrites, nitrates, ammonia, orthophosphates, Ptotal, suspended matter, and chlorophyll a. Additionally, the trophic state (TSIC index) is evaluated.

The Vjosa River is subject to monitoring at five distinct locations (Table 2). The monitoring stations are located at Carshova, Ura e Qytetit (City Bridge), (Ura e Leklit) Lekli Bridge, Memaliaj Bridge and Mifoli Bridge.

Table 2: **Situation of chemical content norms for the Vjosa Basin (surface water), 2023**

Monitoring stations	O_2	pH	NBO_5	NH_4	NO_2	NO_3	PO_4	P-total
Carshova								
Ura e Qytetit								
Ura e Leklit								
Memaliaj Bridge								
Mifoli Bridge								
	I Class (very good quality)							
	II Class (good quality)							

Source: National Environment Agency, 2024

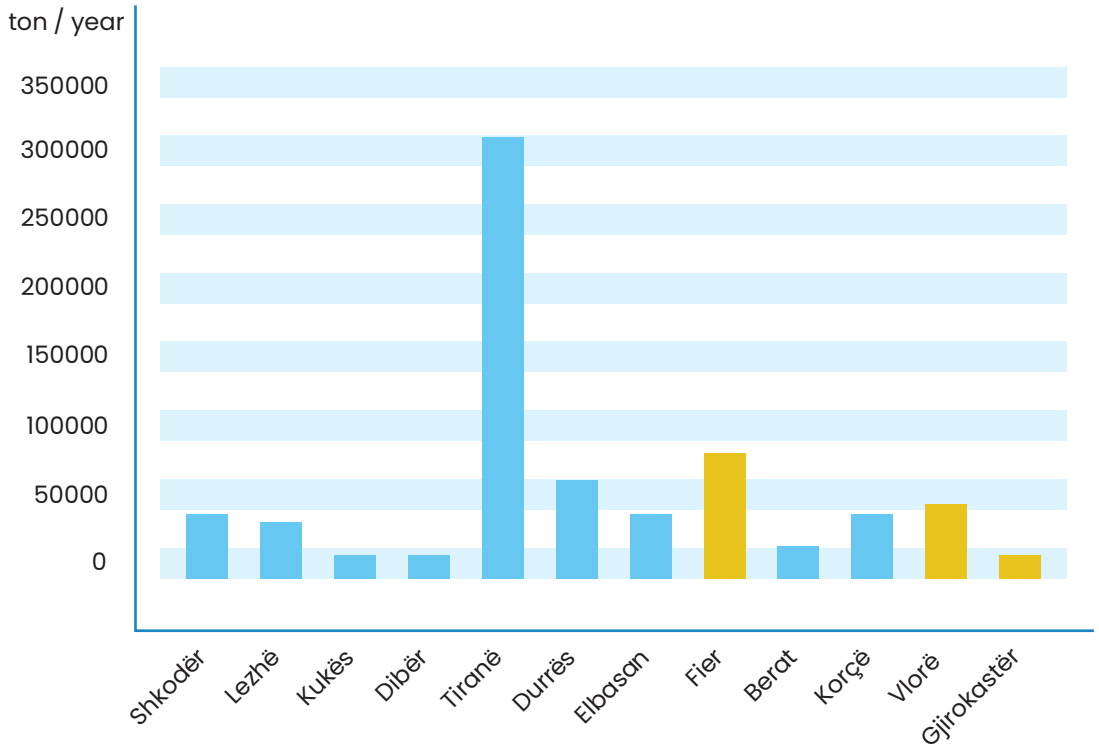
In accordance with the data published by the National Environment Agency, the water quality of the Vjosa River is deemed to be satisfactory, particularly in its upper and middle reaches. The chemical indicators demonstrate that the quality of the surface waters is of a good standard, with the exception of the NBO5 indicator, which gauges the biochemical oxygen demand (BOD) of river water. The values indicated by this indicator suggest a considerable degree of human impact (wastewater), as well as a notable quantity of polluting matter within the river. The surface water in the Vjosa River, west of Mifoli, has been affected by changes in its bed over time. Up to the vicinity of the villages of Çerven and Mifol, the river flows over gravel, while further west it flows over sub-clay. The Vjosa River usually carries a large number of suspended particles, and its water is rarely clear.

Despite this, the surface waters of the Vjosa River have been consistently of high quality and clarity. However, it is evident that pollution has doubled over the years, not only in the main course of the river, but also in its tributaries such as: Bença, Shushica and Drino (Piro, 2014) This is supported by systematic analyses of sustainability from 1970 to 2020, as well as similar studies and media reports starting from 2007 (Korançe and Shallas, 2021). The deterioration of surface water quality is caused by two main factors. The first factor is the dumping of solid urban waste, which is a common problem in areas such as Memaliaj, Këlcyra, Përmeti, Dropulli, Selenica, and others. Unfortunately, urban waste management in almost the entire territory of the Vjosa watershed is inadequate. In the cities of Gjirokastra, Dropulli, Tepelena, Përmet, Memaliaj, Këlcyre, and Libohova, as well as in the administrative units, approximately one-quarter of the produced waste is deposited. Waste is not segregated at the source, and all types of waste, including organic, inert, hospital, recyclable, plastic, glass, metal, wood, paper, cardboard, batteries, tires, and electronics, are deposited in the landfill.

Secondly, the discharge of untreated urban wastewater affects surface water quality. The following areas, which lack a water treatment system, discharge their polluted urban water into Vjosa: Përmet, Gjirokastra, Tepelena, Memaliaj, and Këlcyra. In contrast, rural areas typically use septic tanks. Septic tanks pose two main problems. In the case of hermetically sealed septic tanks, which are cleaned and then discharged into the surface waters of Vjosa, there is a risk of pollution. In the second case, where septic tanks are not hermetically sealed and are filtered directly into the ground, there is a potential for pollution of groundwater. The continuous deterioration of the surface waters of the Vjosa River is exacerbated by the dumping of liquid and non-liquid waste directly into the river. Cities and villages without a functional urban waste management system, such as Gjirokastra Memaliaj, Këlcyra, and Përmeti which is currently without a landfill - as well as Dropulli and Selenica, discharge their waste directly into the river. It is crucial to establish proper waste management systems to prevent further environmental damage. This leads to severe river pollution problems. The table below present an overview of waste generation in Albanian counties (Table 3). Although Vlora and Fieri have had urban waste management administrations for some time, Gjirokastra, in its absence, generates waste and discharges it directly into the river.

Table 3: **Situation of chemical content norms in the Vjosa Basin (Surface Water), 2023**

Source: NEA, 2023



The amount of waste decreased by 28% in the district of Vlora between 2017 and 2022. In contrast, there was an increase of five times the original figure in the district of Gjirokastra and 1.5 times increase in the district of Fier. These fluctuations in figures can be attributed to demographic movements, economic developments and changes in waste management policies (ENA, 2023). These quantities are 140 thousand tonnes in 2022, corresponding to 274 kg per capita (ENA, 2022) and often end up in illegal landfills or the Vjosa river. This poses a serious risk to the quality of surface waters and human health. asked about the most dangerous factors regarding the quality of Vjosa's water, the community of the area pointed to pollution from urban waste and sewage. Even agriculture (28%), weak water supply network (16%), erosion or deforestation (10%) or tourism are encountered as problems, but over 43% of those interviewed think that urban waste and sewage are the main problem of the water quality of the river Vjosa. Another cause of pollution is the release of oil waste. This issue is often highlighted in the media. Albpetrol, a company located near the villages of Gorisht and Cakran, has been identified as one of the polluters. In the Gorisht area, the oil waste has accumulated to a depth of half a meter. Additionally, a high concentration of sulfuric gas has been reported in the Gorisht-Kocul area, up to 8 times higher than the permitted level (Balkan Insight, 2018; Birn, 2023).

River water quality is affected by various factors, such as agricultural or livestock wastewater discharge, which increases organic matter and faecal microorganisms. Additionally, polluted water from groundwater or rivers can indirectly impact water quality. It is important to consider these factors when evaluating river water quality. A study conducted between 2012 and 2014 found high levels of faecal coliforms and streptococci pollution in the waters of Vjosa, particularly in the areas of Këlcyra and Tepelena, and at the confluence of Vjosa and Drinos rivers. The pollution levels were consistently 1-2 times higher in all seasons. The study highlights the serious threat posed by the contaminated waters of Vjosa to the inhabitants who use them for irrigation, swimming, fishing, and other purposes. The only station where the water quality was excellent (quality A) was Çarshova, according to Piro. Furthermore, a 2016 study analysed the physico-chemical parameters of water, including nutrients, coliforms, and heavy metals, at three monitoring points: Çarshovo at the three bridges, the Mifoli bridge, and the Vjosa spillway (specifically near Dëllinja/or Pishë Poros).

The study results indicate that the waters of Vjosa are alkaline (pH>7), which is consistent with the annual reports of the National Environment Agency. Additionally, this study also found high levels of microbiological contamination of coliforms and heavy metals, like the previous study. The heavy metal concentrations were particularly high at the Mifoli bridge and the estuary, indicating that these waters are unsuitable for irrigation or other purposes. Heavy metals, including Pb, Cd, Ni, Cu, Cr and Fe, were found in quantities exceeding the permitted levels at monitoring points along the Vjosa River. The pollution is mainly caused by human activities such as the oil industry, contaminated subsoil of Azotic, waste disposal sites, and agriculture. The pollution of the Vjosa River extends to its delta in the estuary. The increase in temperatures due to climate change also leads to visible deterioration of pollution elements (American Public Health Association, www.apha.org). Water temperatures show the highest values in July-August, ranging from 15.20°C (in Kardhiqi Bridge) to 22.20°C (in Mifol) as monthly averages. Conversely, the lowest average monthly temperatures fluctuate from 6.90°C (in Përmet) to 9.70°C (in Kardhiq). The water temperature amplitudes in the Drino river and the Kardhiqi branch, which receive strong groundwater supply, are smaller than those in Vjosa. The annual average temperature in Vjosë-Mifol is 15°C. (Korançe, Shallas, 2021).

Due to its natural flow, the river carries pollution along its entire length and deposits it into the sea. Although the upstream areas of Vjosa, which are also upstream urban areas, have lower pollution levels, higher transparency, and excellent water quality, the rest of the river has suffered significant damage in terms of water quality and transparency. Additionally, it carries pollution to its estuary in the sea, with the highest levels of pollution found in Mifol, which affects the entire ecosystem balance (Korançe and Shallas, 2021). Water pollution has severe consequences for both biodiversity and people. Unfortunately, little has been done to address critical issues such as urban wastewater discharge and waste management, which have contributed to increase the problem in recent years. The pollution of the Vjosa river is a pressing concern that requires urgent attention under the light of the National Park (especially the urban pollution caused frome solid wastes). Floods have been a contributing factor to the pollution of Vjosa's surface waters over the years.

During floods, sewage contaminates the water of Vjosa. In all cases of flooding, sewage from septic tanks enters surface water, discharging heavy (toxic) metals in high concentration, bacteria such as E-coli and Salmonella, which are harmful to human health and aquatic life. There are also epidemic and food safety risks associated with the various products grown in the flood zone. Apart from Çarshova, Kala and Bistrica, which are of very good quality (category I) or slightly lower quality (category II), the rest of the river has an average quality. In particular, points such as Mifol and Këlcyrë, as well as areas directly affected by pollution sources, often have very poor water quality. The water type varies at different points along the river (Korançe and Shallas, 2021).

Groundwater quality

Groundwater is the main supplier of drinking water and one of the main suppliers (along with rainfall) of rivers. The data indicates that the aquifers in the Vjosa basin are currently under pressure due to overexploitation of their water reserves. The Vjosa Basin is monitored for the following groundwater sources: Buduk, Budrishtë, Vanistër, Kafaraj, Novoselë, Pish-Poro, and Uji i Ftohtë (Tepelenë) (Table 4). Overall, the data indicate that groundwater has good physic and chemical state with small seasonal fluctuations. However, in some cases, the levels of Cl, Mg, Na, and SO4 are slightly above the recommended standards. It is also evident that temperatures have increased by approximately 1°C since 2017, reaching rates of 14.3 °C - 18.7°C. Groundwater temperatures are also affected by climate change, as the standard for groundwater temperatures is 8-15. The average pH values vary slightly with the season but remain within the norm for drinking water.

Table 4: **Physico-chemical content norms of groundwater in the Vjosa Basin, 2023**

Groundwater source	ph	Na	Ca	Mg	Fe	NH_4	Cl	SO_4	NO_3	NO_2	M_p	M_{th}	Fp
Buduk													
Budrishte													
Vaniste													
Uji i Ftohte													
Novosele													
Kafaraj													
Pish Poro													

	complies with national standards
	complies with national standards with worsening trends
	slightly fails to comply with national standards
	fails to comply with national standards at all

Source: National Environment Agency, 2024

The local population uses water from the Pish-Poro and Kafaraj springs, which have a high sodium and chlorine content due to intensive use. This results in polluted water with high salinity, which directly affects the entire population that relies on these groundwater sources for various purposes. In 2023, the hydro chemical content rates (NO2, Cl) in Pish-Poro and Kafaraj exceeded the allowed standards for groundwater pollution. The analysis of the groundwater indicator indicates that the Pish Poro point is deteriorating due to over-exploitation and polluted surface waters of Vjosa. Both the hydrological conditions and the chemical quality of the water are affected. The chemical indicators of the water exceed the maximum parameters allowed for drinking water, so it should not be used as a water supply. Supply can be provided from Novosela or Fieri point. The issues highlighted indicate that the sanitary rules for drilling groundwater are not being followed, particularly in the locations of Kafaraj and Pish Poro, which also have deteriorating chemical and bacteriological parameters. The extensive use of gravel in Vjosa is having a detrimental effect on groundwater reserves in terms of both quality and quantity, disrupting their natural flow. The increase in exploitation reserves of the Vjosa aquifer, as well as the non-professional use of inert materials in the Vjosa river without proper criteria, is causing the salinization of the waters at the Kafaraj and Novosela stations. This phenomenon, also known as water intrusion to the sea, has already occupied about 60% of the aquifer reaching the aforementioned stations.

Water use indicators

Water use in the Vjosa basin is divided into three main subcategories: agriculture, industry, and urban use (usually calculated per capita).

Agriculture demand

Regarding the use of water in agriculture, Fieri has the highest demand, followed by Gjirokastra, where about 60,000 hectares of land require water sources for irrigation, with a growing demand. The irrigation system of the Buduk area (Gjirokastër) is between 90 and 110 litres per second, while in Kafaraj, the amount used is 700 litres per second, and in Novosela, it is 720 litres per second (Korançe and Shallas, 2021). The irrigation system of the Myzeqe field and Vlora field provides an irrigation capacity of 3500 hectares from the Mifoli pump station and a 16 km long drainage channel. The Vjosë-Levan-Fier canal is used for irrigating the lands of Fier. The irrigation infrastructure in Akarnia includes the second and third canal systems, with a combined length of 80 km, as well as the Panaja reservoirs. The system begins at the Mifol water station, which has a capacity of 4000 l/sec, and ends at the agricultural land of Akarnia and the fishing reservoirs in Gorrica. Currently, the irrigated land surface covers an area of up to 1100 ha. The agricultural land in Këndra is irrigated by the artificial reservoir of Panaja, which has a capacity of 1.4 million cubic metres of water for an area of 300 hectares (Korance and Shallas, 2021). The utilisation of water, particularly in the lower reaches of the Vjosa River Valley, is a crucial element in the advancement of agricultural practices. However, this can potentially have adverse effects on the ecosystem of the Vjosa Wild River National Park, given that irrigation requirements may impinge upon the river's natural flow. The diversion of water for agricultural purposes has the effect of reducing the volume of water that sustains aquatic habitats, particularly during periods of drought. This has an impact on fish species and plant communities. Furthermore, the use of fertilisers and pesticides in nearby agricultural activities could result in the contamination of the river, which would have a detrimental impact on the biodiversity of the area and compromise the quality of the water.

Industrial demand

Regarding the industrial use of the river, the Vjosa river is continuously used to meet the relevant industrial demand, without any significant increase over time. Wastewater return flow enters the river downstream. The primary industrial activities are associated with the extraction of oil and bitumen, as well as gravel mining. As reported by the Albanian Geological Service, the Municipality of Selenica is endowed with a diverse range of bitumen deposits, representing a significant economic asset. A total of 11 companies utilises the Selenica source, while there are only three principal sources of bitumen:

1. The bitumen source
2. Bitumen gravel
3. Bitumen sand

Another industrial activity is related to the generation of electricity from hydroelectric power plants. As a consequence of heightened public awareness regarding the indiscriminate utilisation of the Vjosa waters, this issue of risk to the ecosystem has been re-evaluated in recent times (MoET, 2024). In light of the aforementioned industrial activities' utilisation of the Vjosa River's water resources and the dearth of dedicated industrial processing facilities, the latter ultimately discharge into the Vjosa River (Table 5). The total volume of water utilized by various industrial users within each sub-basin is presented below, allowing for the calculation of the annual industrial water consumption (in cubic meters per year) for each catchment area. The table presents the resulting data.

Table 5: **The annual water withdrawal for the industry in the Vjosa sub-basin**

Sub Basin	Drinos	Lower Basin	Memaliaj	Shushice	Pocem	Permet	Carshove
Water used (l/s)	27	17	10	20	0,5	13,2	no data
Water withdrawal (m3/year)	81,5	536,1	315,4	630,7	15,8	416,3	no data

Wastewater return flow enters the river downstream and is currently estimated to be only 10% of the industrial demand, due to the nature of the demand (especially water bottling). Urban areas the water's use is measured per capita or per inhabitant. The standard rate for the water uses in Albania is 150 litres per person per day. However, the value may be too high for some towns or village because of the lack of distribution network, its amortization and the waste of drinking water: For example, in Novosele the designed water use rate was 150 litters per person per day, however the actual rate is 90 litters per person per day. Therefore, in general areas, this indicator is averaged for cities and rural areas, resulting in 54.75 m^3/head/year. Water use not only takes water from the river but also returns it in the form of wastewater, which can contribute to the total volume of the river.

Treatment of urban wastewater in the Vjosa basin

As mentioned in the analysis of the surface water quality indicator, most of the urban areas that are around the Vjosa basin, except for the rural areas that use septic tanks, deposit urban wastewater directly into the river. However, urban wastewater is not treated. The level of treatment of polluted waters in the Vjosa basin has been very poor throughout the years, and it still is today.

Human activity and Vjosa sustainability

Referring to the above paragraphs, it can be said that human activity has affected the sustainability of the Vjosa River in several ways:

1. **Physical structure:** Vjosa riverbed has been affected by various factors, including deforestation, floods, urban development, removal of sediments, etc.
2. **Surface and groundwater quality:** overuse, discharges of urban wastewater, waste spills, industrial discharges, etc., all have influenced the deterioration of water quality over the years reducing the self-purification processes.
3. **Conservation of river ecosystems:** natural corridors, riparian areas and river habitats are under the pressure of human activities, which may endanger their existence.
4. **Alteration of forest area:** damage to forest areas negatively affects the flow of organic inputs, habitats complexity and balance, increases the temperature of rivers and reduces the stability of banks, affects the increase of erosion, etc.
5. **Water flows:** over the years, the level of flows in the Vjosa river has decreased, as a result of climatic changes. One the one hand, high temperatures have influenced the reduction of rainfall, and on the other hand, the use of groundwater by humans has had a negative impact on the flow of the Vjose River (including the construction of small hydropower plants) (Korançe & Shallas, 2021).

2.4.2 Water management approaches

As a finite resource, water is essential for numerous human activities and the sustainability of ecosystems (Bithas et al., 2014; Piemontese, 2020). The mounting concerns surrounding water scarcity and environmental deterioration can be attributed to different causes: the growth in population, urbanisation, industrialisation, intensive agriculture, engineering infrastructure which have led to a significant increase in water consumption. The growing problems worldwide towards the end of the 20th century provided the impetus for many governments to adopt a more systemic approach to water resource management, based largely upon research and policy analysis conducted many years earlier. Consequentially the transition from a sectoral, fragmented approach to integrated water resource management (IWRM) approach, the concomitant establishment of novel institutions and regulatory frameworks, an increased focus on non-point controls, demand management, and public participation and stakeholder involvement represent a significant shift and departure from traditional practices (Moddemeyer, 2010; Pinkham, 1999; Bahri, 2012).

It was previously the case that water-related sectors operated entirely independently of each other, and often with conflicting interests in making use of the limited water resources they all shared. In contrast to this fragmented approach to management, integrated water resource management plans consider a range of interconnected factors, including water supply, pollution control, agriculture, hydropower, and flood control. The primary objective is to enhance the distribution of dwindling water resources, wherein the costs of water are defined in terms of opportunities foregone or the highest value of alternative uses. Figure 3 presents a comparison of the traditional (sectoral) management system with the integrated management system, highlighting the distinguishing characteristics of each approach. The transition away from traditional water management styles is already underway in and beyond countries. In fact, an IRWM approach aligns with Goal 6.5 of the United Nations Sustainable Development Goals (SDGs), which indicates UN member states should implement integrated water resources management at all levels by 2030. The IRWM provides more benefits to water utilities and to the communities they serve than traditional approaches. An IWRM approach (Table 6) can help utilities develop more robust water systems that meet their needs now, and in the uncertain and ever-expanding urban future (Figure 8).

Table 6: **Traditional Water Management versus Integrated Water Management**

#	Traditional Water Management	Integrated Water Management
1	Water supply, wastewater, and stormwater systems are managed separately.	All water sources and systems are intentionally connected and managed to provide water, energy, and resource recovery.
2	Systems only consider direct water inputs and outputs.	Water systems consider land-use design, regulations, and community health benefits.
3	Technological solutions are standardized (one size fits all) and stand-alone.	Management and technological solutions are customized, flexible, and scalable to meet area-specific goals and needs.
4	The top monitoring and decision-making priority is cost.	The focus is on value creation by periodically evaluating investments, processes, and technologies.
5	Water and wastewater systems are designed according to standard empirical approaches and historic rainfall records.	Water and wastewater systems use multiple data sources and techniques to accommodate variability.
6	Infrastructure is determined by the quantity of water required or produced by end-users.	System infrastructure is multifaceted to meet the quantity, quality, and reliability needs of different end-users.
7	Stormwater is considered an annoyance.	Stormwater is considered a valuable resource to support aquifers, waterways, and vegetation.
8	Water systems are mostly made from unsustainable materials (concrete, metal, or plastic).	Systems combine green infrastructure (soil and vegetation) and grey infrastructure (concrete, metal, and plastic).
9	Water follows a one-way route from supply to single use, to treatment, and disposal	Water is reclaimed and recycled multiple times flowing from higher to lower quality routes.
10	Only collaborates with agencies and the public when predetermined solutions require approval.	Actively collaborates with other agencies and the public to help develop effective, innovative solutions.

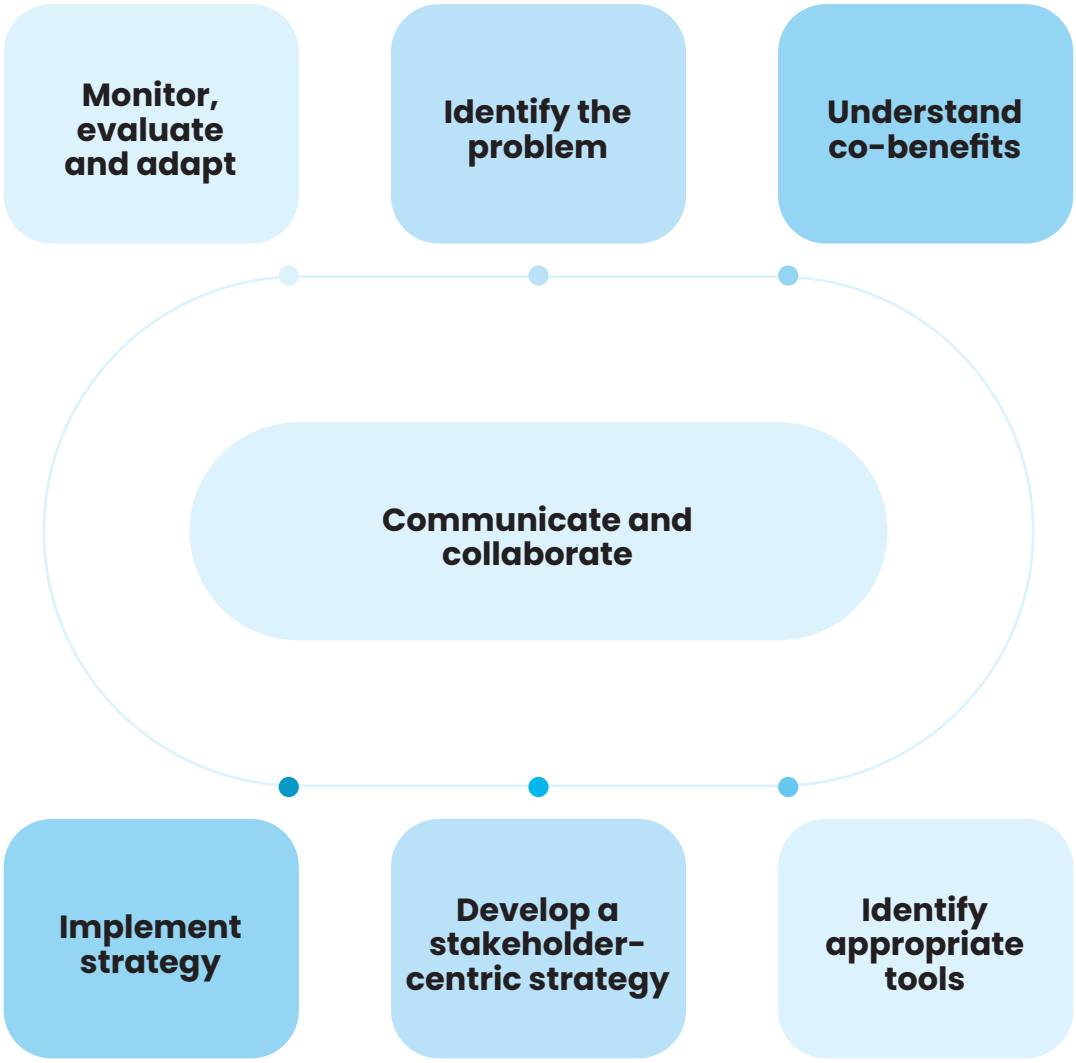


Figure 8: **The Process of Integrated Water Management**

The most important challenge in IWRM is to develop an economically efficient and equitable allocation of water resources, given the competing demands from various sectors, including agriculture, industry, municipal water supply, power generation, flood control, navigation, and wastewater management. This is further complicated by the inevitable presence of externalities, whereby the interests of those situated upstream and downstream lie in different geographical or legal jurisdictions. Furthermore, even if economically efficient solutions that fully recognise opportunity costs can be identified for the relevant society as a whole, considerations of equity in the allocation of resources may arise, and political considerations invariably do so. The crux of the matter is how to arrive at reasonable compromises between the numerous objectives and constraints involved in a sustainable manner, that is to say, based on integrated water resource management or basin-based management plans.

To this end, many new institutional, legal and regulatory initiatives have been taken on Europe to facilitate a more holistic, cross-jurisdictional approach to water resource management (see chapter 3.)

2.4.3 Challenges and key issues

As a candidate for EU membership, Albania is obliged to fulfil the objectives outlined in the EU Directive on IWRM. While progress has been made towards compliance with the directive, further effort is required to ensure full compliance. This will require institutional development and effective coordination at the local, regional, and central levels. Although the legal framework of IWRM has been approved, there are other issues such as the integration of IWRM activities into other sectors, such as agriculture and industry; the monitoring system, and community awareness of how to behave with this new management approach are all important considerations. In more detail, these main problems in IWRM can be identified:

Lack of the Basin Management Plan

In developing a River Basin Management Plan, it is essential to recognise that Albania is a candidate for membership of the European Union and that the EU has specific requirements for such a plan. While the drafting (and subsequent approval) of these plans has been completed for most Albania's river systems, this is not the case for the Vjosa River basin. The characteristics of the Vjosa River have presented a significant challenge in the drafting and approval of the Vjosa River Basin Management Plan. Nevertheless, the postponement of the Vjosa River Management Plan represents a potential vulnerability, as the absence of a comprehensive plan presents obstacles to achieving a harmonious equilibrium between conservation objectives and the needs of local communities and regional agriculture. Without a clear plan, there is no unified strategy to guide decisions regarding water use, habitat protection, or sustainable development. Here are some of the key issues and potential risks stemming from the absence of such a plan: Fragmented Water Use Practices; Biodiversity and Ecosystem Risks; Lack of Guidelines for Infrastructure Development; Missed Opportunities for Sustainable Economic Development.

Lack of Institutions

The IWRM principles call for the establishment of a well-defined institutional framework that clearly outlines and divides responsibilities and roles for the design and implementation of operational and regulatory activities, while promoting coordination between the relevant authorities. From an institutional perspective, the management of water resources in Albania has led to overlapping responsibilities between central and local level institutes, resulting in a fragmented water sector with inefficient activities and a lack of transparency.

Lack of the intersectoral coordination

Effective cross-sectoral coordination is essential for IWRM. This is particularly important for policies related to water and the environment, health, energy, agriculture, industry, spatial planning, and land use. It requires multi-level cooperation between interest groups and greater cross-border collaboration between countries on the use of water resources.

Lack of data and information

The IWRM principles and EU environmental policies require the timely development of relevant water policies, data, and information that are consistent, comparable, and exchangeable. This is necessary for assessing and improving policies and water management. Efficient coordination and information exchanges between water-related suppliers, data collectors, and users are necessary. It is important to note that environmental monitoring alone is not sufficient. For many years, monitoring activities have been rudimentary, resulting in a lack of actual and factual data on the status of water resources. The current monitoring system lacks regular reporting.

Lack of financial resources

The mobilization and allocation of funding for the water sector is a shortcoming, which needs to be addressed. Albanian regulation includes EU principles for environmental policy, such as the 'polluter pays' and 'user pays' principles, as well as payment for environmental services. The implementation of the EU Directives' investments, including short-, medium, and long-term investments, are still being reviewed to ensure compatibility related to urban wastewater treatment, drinking water provision, and flood risk management.

Legal shortcomings

The Albanian water management system requires relevant secondary legislation to effectively manage water resources and implement necessary mechanisms. This will promote the creation of water management frameworks that help balance the needs of water users, rural and urban areas, and future generations. Most of the secondary legal acts need to be drafted by the line ministries, which may have additional tasks. To comply with the requirements of the European Directives and address important aspects, the law would require secondary legal acts, including:

1. Monitoring the state of marine water, surface water, groundwater, and protected areas.
2. Managing natural waters such as curative, mineral, and geothermal waters.
3. Sanctions and penalties may be imposed for non-compliance with the law, particularly in cases of pollution of natural resources, curative, mineral and geothermal waters.

Shortages in human resources

These shortcomings are related to the capacities and abilities of the relevant authorities to cope with the implementation of the IWRM. This involves the combination of a series of tasks, which may include many different activities, requiring administrative capacities for issues such as water use, pollution control, monitoring, financial management, etc.

Limited engagement of interest groups

The involvement of local actors in Albania's current engagement is not significant in terms of major contributions towards the design and implementation of common practices. The IWRM strategy involves a round of stakeholder consultations to engage in discussions with private and other actors who have a role in achieving the outcome or are affected by water-related decisions. Raising public awareness and promoting discussion of the risks and costs associated with water availability and pollution can help establish agreement on responsibility and financing, leading to improved resource sustainability.

2.4.4 Questionnaire results

A questionnaire campaign was conducted for the Water Supply and Wastewater Treatment about the Vjosa River with the objective of gathering valuable insights from a variety of stakeholders, including the public and private sectors. The campaign was designed to serve multiple purposes, including the identification of ecological issues, the understanding of the social and economic impact of the water management, and the exploration of the effectiveness of existing policies. In light of the findings from the questionnaire, it can be posited that the most pressing issues pertaining to water management in the Vjosa Basin are those of water pollution, climate change, investment deficiencies, and the inefficiency of public administration. In response to queries regarding the most significant threats to the quality of Vjosa's water, the local community identified pollution from urban waste and sewage as a primary concern (Figure 9). Agriculture (28%), weak water supply network (16%), erosion or deforestation (10%) or tourism are encountered as problems, but over 43% of those interviewed think that urban waste and sewage are the main problem of the water quality of the river Vjosa.

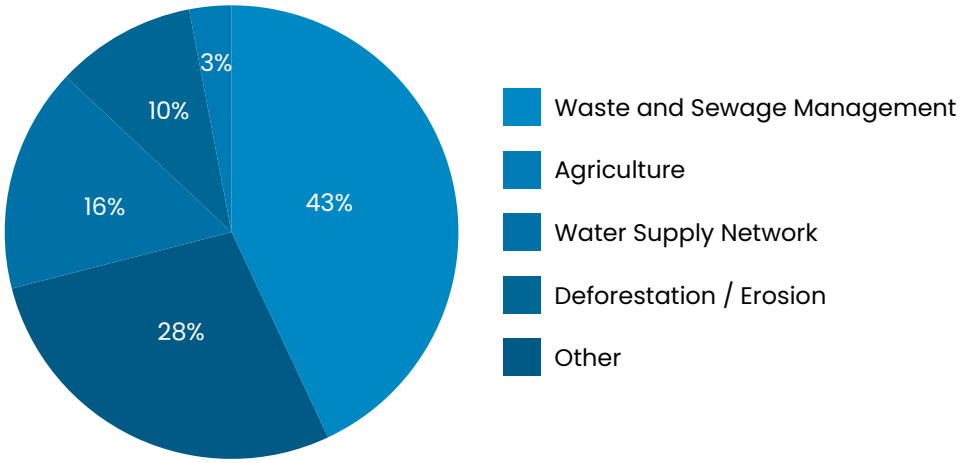


Figure 9: **Threats to the quality of Vjosa Water**

Inquiries concerning the efficacy of managerial practices among public bodies responsible for water management have yielded a perception of average (39%) or below-average (53%) efficiency in public administration by the community. Simultaneously, the community perceives public administration as a vital means of addressing two significant concerns: the management of natural resources (including water, forests, economic exploitation, and so forth) and the flooding issues resulting from the Vjosa river (Figure 10).

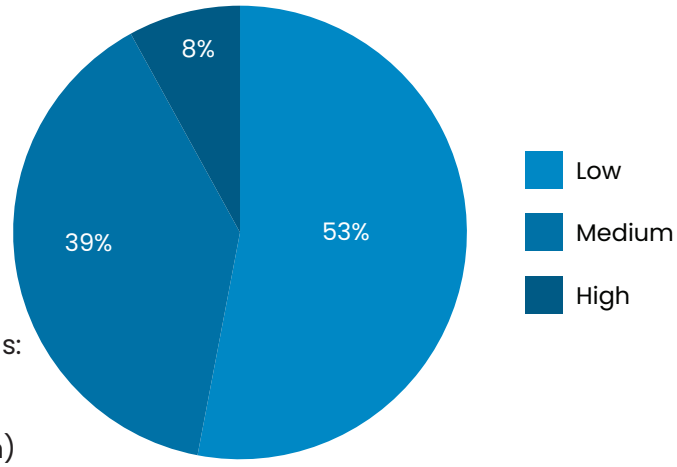


Figure 10: **Public Entities Efficiency**

The results of the questionnaire indicate that the majority of respondents believe that climate change is affecting the hydrographic equilibrium of the Vjosa Valley (Figure 11). As evidenced by the survey results, over 70% of respondents indicated an increase in the duration of climatic dryness and a reduction in snowfall. Furthermore, 70% of respondents ascribe the rise in flood occurrences within the Vjosa Valley region to climate change. Approximately 50% of the respondents provided evidence that the quantity and, to a lesser extent, the quality of surface water will be impacted by climate change. Furthermore, 65% of respondents demonstrated awareness of the water sources in the Vjosa Valley, which have resulted in a decline in water flows.

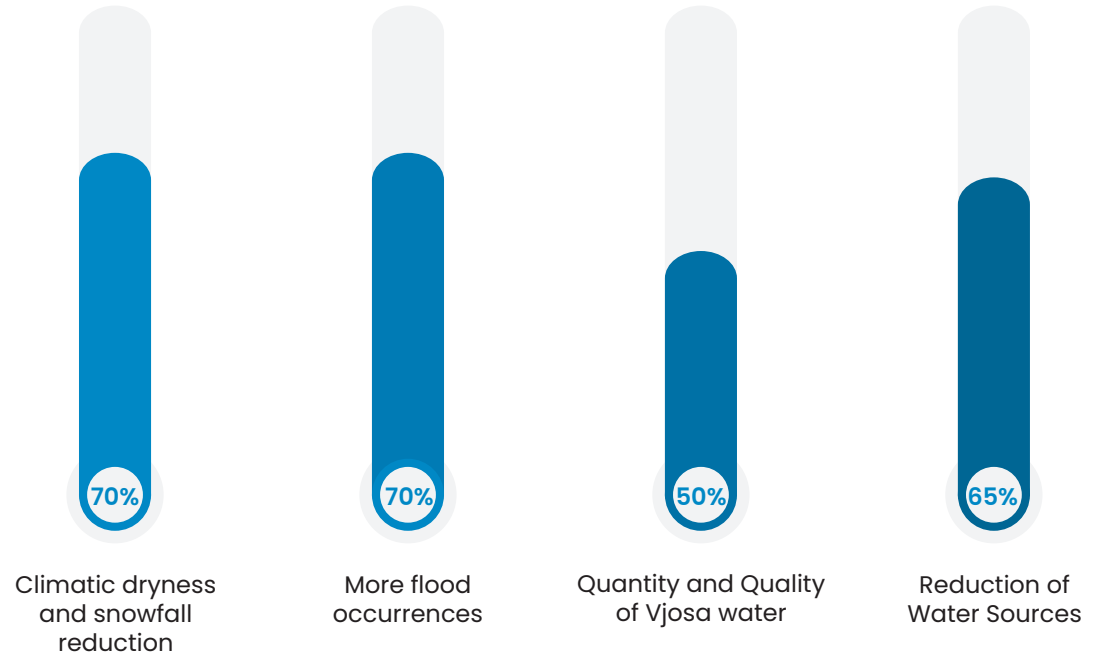


Figure 11: **Interviewees' perception regarding the consequences of climate change**

2.5 Management response to address the issue

Issue 1

Lack of data and information

Measure 1

Clear communication channels: Define and communicate clear channels for exchanging information between the different organizations. This might include regular team meetings, email updates, collaboration tools, or dedicated communication platforms.

Measure 2

Collaboration tools using technology to facilitate communication and collaboration. This could include project management software, shared document repositories, instant messaging platforms, and video conferencing tools to enable real-time communication and document sharing.

Measure 3

Provide training ensuring that employees have the necessary skills and training to effectively use communication and collaboration tools, providing ongoing support and resources to help them navigate challenges and maximize productivity.

Issue 2

Intersectoral coordination lack

Measure 1

Committees or Working Groups comprising representatives from each sector. These groups can facilitate regular communication, collaboration, and joint decision-making on issues that intersect across sectors.

Measure 2

Policy Alignment and Coherence among sectoral policies, regulations, and institutional frameworks to minimize conflicting objectives and promote synergies. Review existing policies and regulations to identify barriers to cross-sectoral coordination and explore opportunities for harmonization and integration.

Measure 3

Participatory Governance Structures that involve diverse sectors and levels of government in decision-making processes.

Issue 3

Institutional Lack

Measure 1

Clear Goals and Objectives: Ensure that all institutions involved have a clear understanding of common goals and objectives.

Measure 2

Coordination Mechanisms, such as committees, task forces, or working groups, to facilitate collaboration and communication among institutions.

Measure 3

Roles and Responsibilities: Clarify the roles and responsibilities of each institution involved to minimize overlap and duplication of efforts. Delineating roles helps prevent confusion and enhances accountability.

Measure 4

Establish Communication Channels including meetings, forums, and electronic communication platforms.

In summary following management responses to address the water supply and wastewater treatment have to be listed.

Issue 4

Limited engagement of interest groups

Measure 1

Identify key stakeholders: Identify the key interest groups relevant to the organization. This might include industry associations, advocacy groups, community organizations, or government agencies. Understanding their interests and concerns is essential for effective engagement.

Measure 2

Tailor communication: Tailor communication efforts to resonate with the interests and priorities of different interest groups. Use targeted messaging and channels that are most likely to reach and engage each stakeholder segment effectively.

Measure 3

Create platforms for dialogue: Create platforms or forums for dialogue where stakeholders can come together to discuss common issues, share perspectives, and collaborate on solutions. This might include stakeholder meetings, workshops, or online forums.

Measure 4

Demonstrate impact: Showcasing the impact of stakeholder engagement can help motivate continued participation. Share success stories, case studies, or testimonials that highlight the positive outcomes resulting from collaboration with interest groups.

Issue 5

Institutional Lack

Measure 1

Conduct a comprehensive review of existing laws, regulations, and policies to identify any gaps, inconsistencies, or outdated provisions. This involves analyzing the legal framework against relevant standards, best practices, and emerging trends.

Measure 2

Stakeholder consultation with relevant stakeholders, including legal experts, government agencies, civil society organizations, and affected parties, to gather input and perspectives on legal shortcomings. This can help identify areas of concern and potential solutions.

Measure 3

Propose and advocate for legislative reforms to address identified legal shortcomings. This may involve drafting new laws, amending existing ones, or repealing outdated provisions to ensure compliance with international standards and best practices.

Measure 4

International cooperation: Collaborate with international partners, such as other countries, regional organizations, and multilateral institutions, to exchange best practices and experiences in addressing legal shortcomings. This can help leverage external expertise and resources to support domestic efforts.

Issue 6

Financial lack

Measure 1

Prioritize objectives based on their importance and urgency for compliance. Focus resources on implementing objectives that have the most significant impact on water management.

Measure 2

Allocate funds based on measure 1 to cover the costs associated with compliance, including staff training, technology upgrades, and legal fees.

Measure 3

Seek funding opportunities exploring funding opportunities provided by the EU or other sources to support the water sector. This could include grants, subsidies, or financing programs.

Issue 7

Shortages in human resources

Measure 1

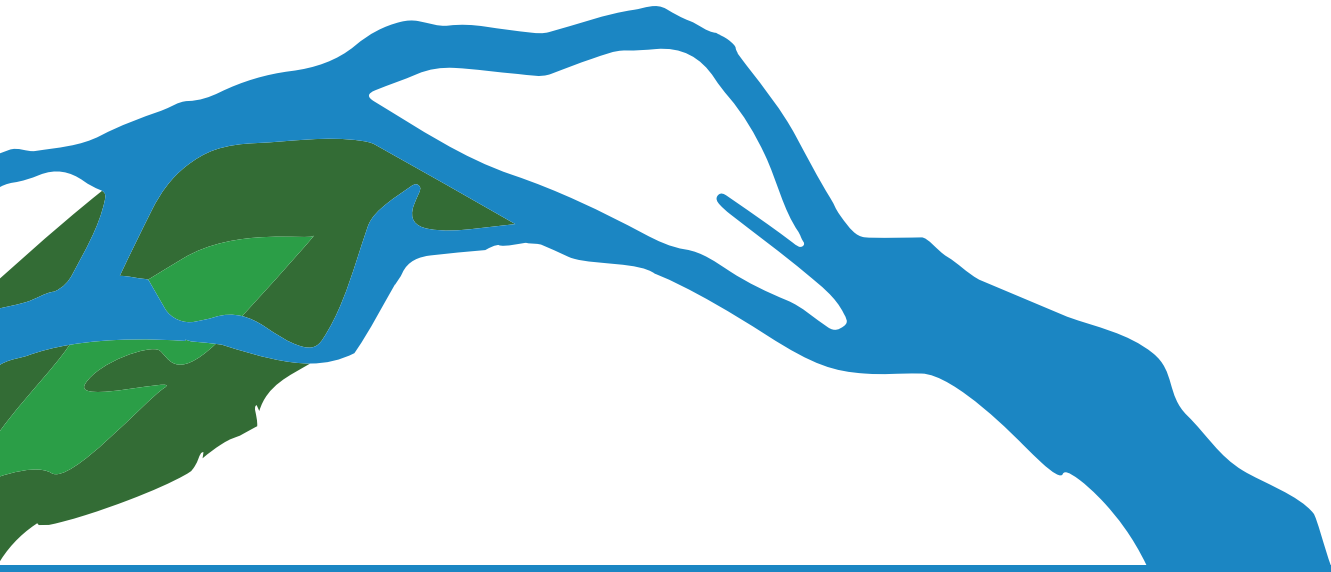
Focus on core functions: Identify core functions and prioritize staffing and resources accordingly. Streamline non-core activities or consider outsourcing them to third-party providers to reduce costs while maintaining focus on essential operations.

Measure 2

Cross-training and multi-skilling: Cross-train employees to perform multiple roles or tasks within the organization (especially flood risk identification and calculation). This enhances flexibility and resilience, allowing the organization to function effectively with fewer specialized resources.

Measure 3

Utilize technology and automation: Invest in technology and automation solutions to streamline processes and reduce the need for manual labor. This can help offset staffing shortages by increasing operational efficiency and productivity.



2.6 Conclusions

Despite the biodiversity and ecological value of the Vjosa River, economic activity has caused and continues to cause much damage to the ecosystem of the Vjosa Basin. Human activity and pressure on the unique water resources of the Vjosa Basin cause damage, both directly to the natural resources and, in the medium and long term, to the economic and social activity of the population living around the basin. At the same time, climate changes with global effects are also felt in the water flows of the Vjosa and affect the biodiversity of the Vjosa basin. The countries of the European Union, aware of the need to preserve the biodiversity and ecosystems of water resources (rivers, lakes, sea), have presented their plans (through the 2007 Directive) with the aim of managing water use and, apart from that, behaviour in the event of floods (IFRM), which are becoming more and more frequent. The preparation and implementation of these plans is not an easy challenge for a small country like Albania, which is rich in water resources. According to the analyses carried out, this study proposes the following priorities and recommendations:

1. **Addressing the risk irrigation** - The implementation of techniques such as drip irrigation, rainwater harvesting, and other water-efficient methods has the potential to alleviate the strain on the river's resources, thereby contributing to the sustainability of the river system. Another potential solution is the establishment of buffer zones. This approach can facilitate the prevention of agricultural runoff, as the vegetation planted along the riverbanks has the capacity to filter pollutants before they reach the water. Finally, the involvement of the local community and the promotion of sustainable development are key factors. The promotion of sustainable agricultural practices and the involvement of local communities in conservation decision-making processes have the potential to enhance the efficacy of conservation outcomes.

2. **Climate change** - exerts a considerable influence on river ecosystems, with ramifications that extend to a multitude of levels, including the availability of water, the quality of habitats and the diversity of species. In order to address these changes, strategies are divided into two categories: adaptation and mitigation actions: a. The management of water resources through the creation of reservoirs during periods of heavy rainfall by preventing water withdrawal, especially in dry seasons. b. The renaturation and habitat conservation through the restoration of wetlands and banks and the protection of riparian forests.

3. **Addressing the reduced sewerage coverage** - The discharge of sewage into rivers presents a significant threat to river ecosystems. To mitigate this negative impact, it is necessary to invest in the construction of the sewage system in areas where coverage is very low or low.. Furthermore, constructed wetlands and green infrastructures are natural treatment systems that filter pollutants and reduce the impact of sewage on rivers by using vegetation and soil to absorb and break down contaminants. Riparian buffer zones (vegetation along riverbanks) are also effective in filtering pollutants before they enter the water and provide habitat for wildlife.

4 **The implementation of the Vjosa River Basin Management Plan** – This plan represents a crucial step in the protection and sustainable management of this valuable natural resource. In light of the pivotal role of the river basin management plan and its absence in the case of the Vjosa River, it is of paramount importance to draft and commence implementation of this plan. Considering the distinctive characteristics of the Vjosa River, it is essential that the plan be developed in a manner that is aligned with the needs and concerns of both the border section of the river and the Vjosa River National Park. Despite its introduction to the discussion phase, the plan has yet to reach the draft report phase. In the context of growing awareness of climate change and its impact on local communities, the necessity for an integrated approach to river management is becoming increasingly apparent. The formulation of a Vjosa River Management Plan could assist in the protection of the river's ecosystems, the promotion of sustainable agricultural practices and the resolution of stakeholder conflicts. This would ensure the continued viability of this unique wild river for future generations.

5 **The institutional organisation** - The difficulties in terms of institutional and human organisation are related to the coordination of the different stakeholders, both at the institutional level and at the intersectoral level (since the management plan requires the cooperation of stakeholders from different sectors, and not only those directly involved in water management). On the other hand, if the primary legislation is complete and in line with the European Union directives, the secondary legislation (instructions, regulations, national directives) that would complete the primary legislation is missing. Human resources are an easy challenge, since the IFRM concept requires the identification, analysis, and calculation of flood risks. This requires human resources that are trained and capable of collecting, processing, and analysing statistical data from many operational sectors.

6 **Funding for the implementation of the management plan** - another difficulty relates to the funding of activities to implement the management plan. In such a situation, priorities have to be set, and in the absence of central and local funds, financial resources have to be sought at European level (grants, loans or participation in various development projects).

7 **Community involvement:** Involving the community in river water protection is essential for creating sustainable and effective conservation efforts. Communities can provide local knowledge, resources, and ongoing stewardship that make a real difference in preserving the health of rivers like the Vjosa. There are numerous avenues for community involvement, commencing with the dissemination of knowledge through seminars, conferences, and other forms of education. This is followed by the provision of incentives or financial assistance for programmes or economic activities that are primarily focused on environmental protection and its sustainable development.

3

Hydropower

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Executive summary

This technical report on the energy sector study in Albania has been prepared under the ESPID4Vjosa Program, which is implemented by Euronatur and EcoAlbania with financial support from the Austrian Development Agency (ADA).

The analysis of qualitative and statistical data shows that Albania continues to be highly dependent on energy imports, especially in the crude oil sector. In the field of hydropower, 252 concession agreements have been signed for the construction and operation of small hydropower plants in the country, with 58 such plants planned in the Vjosa River Basin. However, there is debate regarding the exact number of concessions permits.

Hydropower experience in Albania is among the most developed in the region, with hydropower constituting about 99% of the installed capacity. Nevertheless, this situation is significantly impacted by climate change, leading to high variability and vulnerability in energy production.

In particular, hydropower constructed in the Vjosa Basin accounts for only 0.44% of the total installed capacity in the country for 2022. However, if we compare the planned power in the basin with the total planned power in the country, the Vjosa Basin would contribute a potential of 261.7 MWh or 28% of the planned potential to be built in the country. However, hydropower plants in the Vjosa Basin have faced strong opposition from residents, civil society, and public figures, reflecting the challenges in developing hydropower in the country.

On the other hand, the potential for solar and wind energy is high, with significant solar irradiance in Albania. The development of solar energy technologies is shifting the government's energy policy, turning the country into a high-potential destination for renewable energies. Government plans for licensing 1.2 GW of new capacity are progressing positively, with 460.5 MW already licensed and an additional 300 MW expected to be tendered by June 2024. This will result in 760.5 MW of licensed renewable energy capacity by 2024.

A swift shift toward new capacities without a strategic master plan that considers all technical, economic, security, and development aspects may pose challenges to the country's physical infrastructure, overproduction, and potential system shutdowns due to a lack of transmission capacity. Additionally, this could lead to a financial gridlock in feed-in and CfD subsidy systems, as well as cybersecurity issues in the energy sector.

Recommendations to address these challenges include increasing investments in energy infrastructure, revising policies and laws in the energy sector, and improving collaboration with local communities on renewable energy projects. There is also a need to build institutional and technical capacities to promote the use of renewable energy technologies in the Vjosa Valley and to develop local technical capacities.

In conclusion, this technical report on hydropower and renewable energies in Albania, with a particular focus on the Vjosa Basin, analyzes deficiencies in three priority areas and nine specific shortcomings. It also suggests measures for institutions, the academic community, and both local and central government authorities to address these issues effectively.

3.1 Introduction

3.1.1 Background and Objectives

Albania is a country that imports goods and services, with a particular emphasis on energy imports. This situation limits the country's economic growth and development and has a negative impact on the trade deficit, making the country vulnerable to supply disruptions. The energy sector in Albania is dominated by carbon energy sources, especially crude oil, which constitutes more than half of the total primary energy supply. Domestic production cannot fully meet the country's needs, making Albania a net importer of energy.

Hydropower dominates electricity production, representing around 99% of the installed capacity in the country. This indicates that Albania has the highest level of renewable energy in the region, but it also highlights the country's significant dependence on rainfall. This vulnerability to climatic externalities creates high variability in its energy production. In addition to the socio-economic impacts of relying solely on hydropower, Albania is also the most climate-vulnerable country, as evidenced by high temperatures, decreased precipitation, frequent and rapid floods, and prolonged droughts.

Energy security, sector stability, and a reliable supply of energy at competitive prices are some of the key challenges that the country needs to address in the short term. These challenges can be met by further increasing the share of renewable energy in the national energy mix and by diversifying the country's electricity sector.

Currently, most of the electricity is produced in the northern and eastern parts of Albania, where large hydropower reservoirs are located. However, scattered throughout the mountainous regions of Albania are hundreds of smaller 'run-of-river' hydropower plants in operation.

Between 2005 and 2022, the Albanian government signed 252 concession agreements for the construction and operation of small hydropower plants in Albania's river basins, including the Vjosa River Basin. Although the exact number of issued concession permits has always been a matter of debate, according to the AKBN register, there are 179 concession contracts and 74 contracts with production capacities under 2 MW according to VKM 822/2015. Given the significant water flow of the Vjosa River, with average annual discharges of around 195 m^3/s at its mouth into the Adriatic Sea and a minimum summer flow of 33 m^3/s, the Albanian government has traditionally valued the hydropower potential of the Vjosa River.

In addition to plans for small hydropower plants, the issue of hydropower in the Vjosa Basin has been significant and supported by partial studies (Sogreah 2008/9), which assessed the hydropower potential of the Vjosa River through the construction of dams on its main body, with a total production capacity of 458 MW. The study projected the following: HEC Kaludh 54 MW, HEC Dragot 109 MW, HEC Kalivaç 92 MW, HEC Poçem 99.5 MW, and HEC Karbonari 68 MW. The energy produced from these hydropower plants would be, according to the study, 1810 GWh per year and would supply energy to approximately 276,823 households.

Plans to build the Kalivaç and Poçem hydropower plants, with an installed capacity of 210 MW and a total investment of 250 million euros, have been strongly opposed (legally, media-wise, politically, and scientifically) by residents, civil society, and the engagement of national and international public figures. Their efforts, alongside support from international environmental organizations, culminated in a major success: the establishment of the Vjosa Wild River National Park (VWRNP). This designation effectively halts hydropower developments at Kalivaç and Poçem, preserving the Vjosa River in its natural state and marking a significant victory for environmental conservation in Albania.

The increasing demand for energy and the high potential for energy production from the Vjosa River and its tributaries through hydropower plants have been and remain the most serious threat to the "Vjosa River – one of the last wild rivers in Europe."
On the other hand, the potential for solar and wind energy is significant. 'Solar irradiance' in Albania is very high across most of its territory, exceeding 1,500 kWh/m² per year, with peaks up to 1,753 kWh/m² annually, particularly in the western part of the country.

Meanwhile, according to IRENA's assessments in a low capital cost scenario, Albania has competitive wind potential up to 7,400 MW. However, IRENA's REmap scenario proposes an installed wind capacity of 616 MW by 2030, with an annual generation potential of 1,794 GWh.

3.1.2 Objective of the Work

The objective of this technical report is to support the ESPID4Vjosa project team in analyzing the hydropower sector in the country, with a focus on the Vjosa River Basin. The report aims to analyze the energy sector, national plans, and strategies, and then sector-specific factors that have a direct or indirect impact on the Vjosa River Basin.

Section 2 of the report (Section 1 is the introduction) presents an analysis of the situation related to key issues in the sector, including capacity and projects developed and planned in the field of hydropower in the country. Further, the section outlines which projects impact the Basin, and discusses the current, utilized, or untapped potential of renewable energy resources.

Section 3 will present a development of the political, legal, and institutional framework of the energy sector. This will include a focus on licensing and development policies.

Section 4 will analyze the shortcomings in the hydropower sector and renewable energy, with a primary focus on the Vjosa Basin.

Section 5 will address measures to tackle the identified shortcomings within the legal, institutional, and national and local policy contexts.

Finally, **Section 6**, which is the concluding section, will attempt to provide some conclusions for consideration by the relevant institutions.

3.2 Methodology of the Report

The methodology for preparing this technical report followed a structured process to ensure the quality and accuracy of the data presented. This methodology is based on a thorough and structured analysis of the energy sector in Albania, with a specific focus on hydropower and the potential of renewable energy sources. Special attention was given to developments in the Vjosa River Basin. During this analysis, a wide range of research tools were used to collect and analyze the necessary data to understand the current situation, challenges, and opportunities in the country's energy sector. The following describes the main phases of the methodology used to prepare this technical report.

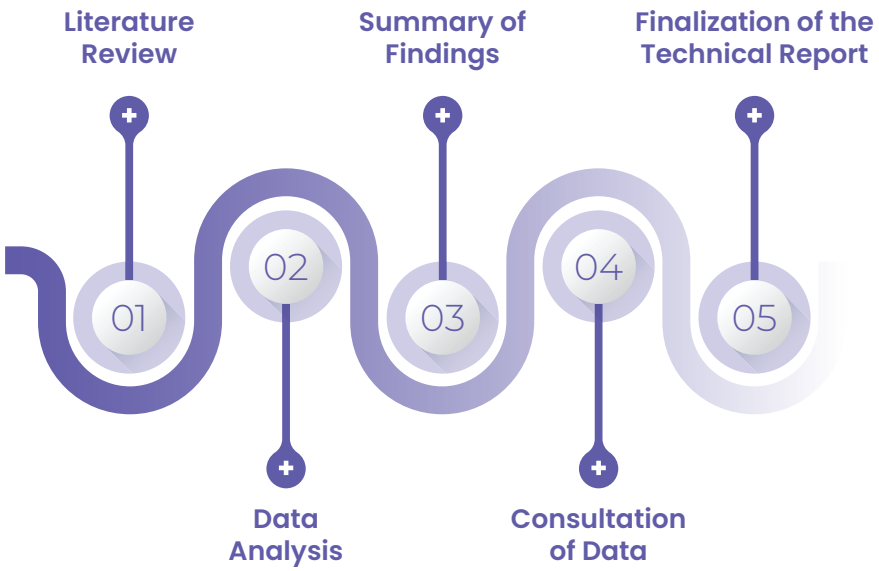


Figure 12: **The main phases of the methodology used to prepare this technical report**

1. **Bibliographic Research and Document Analysis**: Reviewing documents, laws, and legal acts related to energy, as well as national and international reports on energy in Albania and official sources for the energy sector in Albania.

2. **Data Analysis**: The collected data were analyzed using statistical and analytical tools to identify trends, strengths, and weaknesses in the sector, as well as potentials for development and improvement.

3. **Synthesizing findings and recommendations** presented in national and international reports by various stakeholders concerning the energy sector, with a focus on Renewable Energy and Hydropower.

4. **Consultation of the Draft Technical Report in Thematic Workshops.** After data collection, it is crucial to conduct a consultation and validation process to ensure the accuracy and reliability of the information. This will include checking sources, assessing potential awareness of errors, and evaluating the consistency of the data with the theoretical basis and the context of the study.

5. **Finalization of the Technical Report.** This process will involve reflecting on and addressing comments and suggestions from the field consultation process.

3.3 Context of the Development of Hydropower and Renewable Energy

3.3.1 Overview of the National Energy Balance

Albania reports to Eurostat on the energy chapter, and its reports are within the standards set and the obligations of the Energy Treaty (Table 7). According to these reports, the total primary energy production in the country is 1823 ktoe (kilotonnes of oil equivalent) and it imports 1466 ktoe, having available about 3289 ktoe of primary energy products for the year 2021. If converted to MWh, the balance would be 38,255 MWh, where 21,200 MWh are produced domestically and 17,054 MWh are imported.

Table 7: **Energy balance in Albania.**

Energy balance 2021	Import	Output	Total
ktoe	1466	1823	3289
MWh	17,054	21,200	38,255

Source: Eurostat 2022.

Primary energy supply in Albania is dominated by oil, hydropower plants, and imported electricity, which indicates that imports of oil by-products, electricity, and a small amount of coal account for over 56% of the total primary energy consumption, as shown in Figure 13 below.

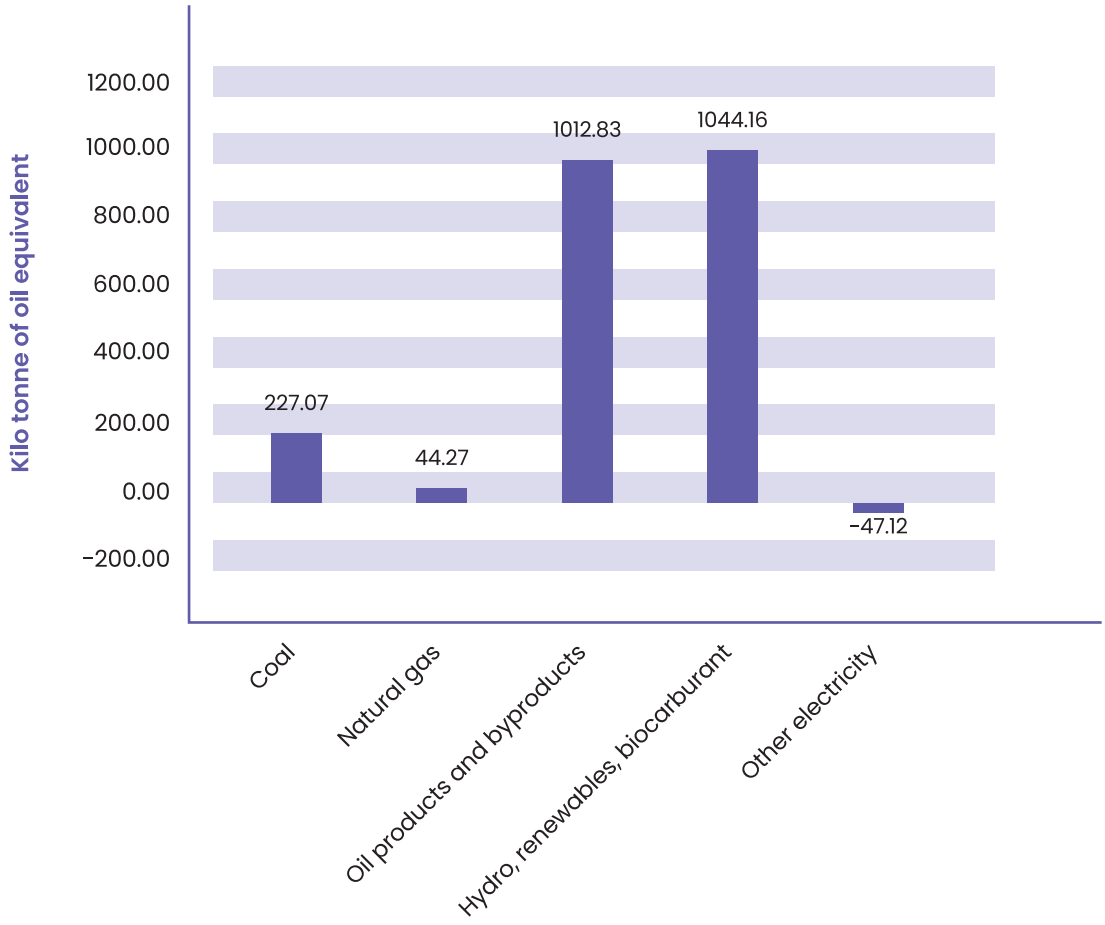


Figure 13: **Primary energy production.**

Source: Eurostat 2022.

After losses in transmission, transformation, refining, industrial outputs totalling 15 ktoe (or 178 GWh), exports (913 ktoe), stock reserves (49 ktoe), international aviation (17 ktoe), losses in distribution and transmission (121 ktoe), and consumption by the energy system itself (92 ktoe), the remaining amount of energy for final consumption is 2013 ktoe. As shown in Figure 13, final energy consumption is distributed as follows: 42% electricity and renewable energies and biofuels, 11% coal and solid fuels, 47% oil and its by-products. Thus, the final consumption balance is 58% from fossil-based fuels and 41% from clean, carbon-free energy. 1% is the use of natural gas, or 7 ktoe.

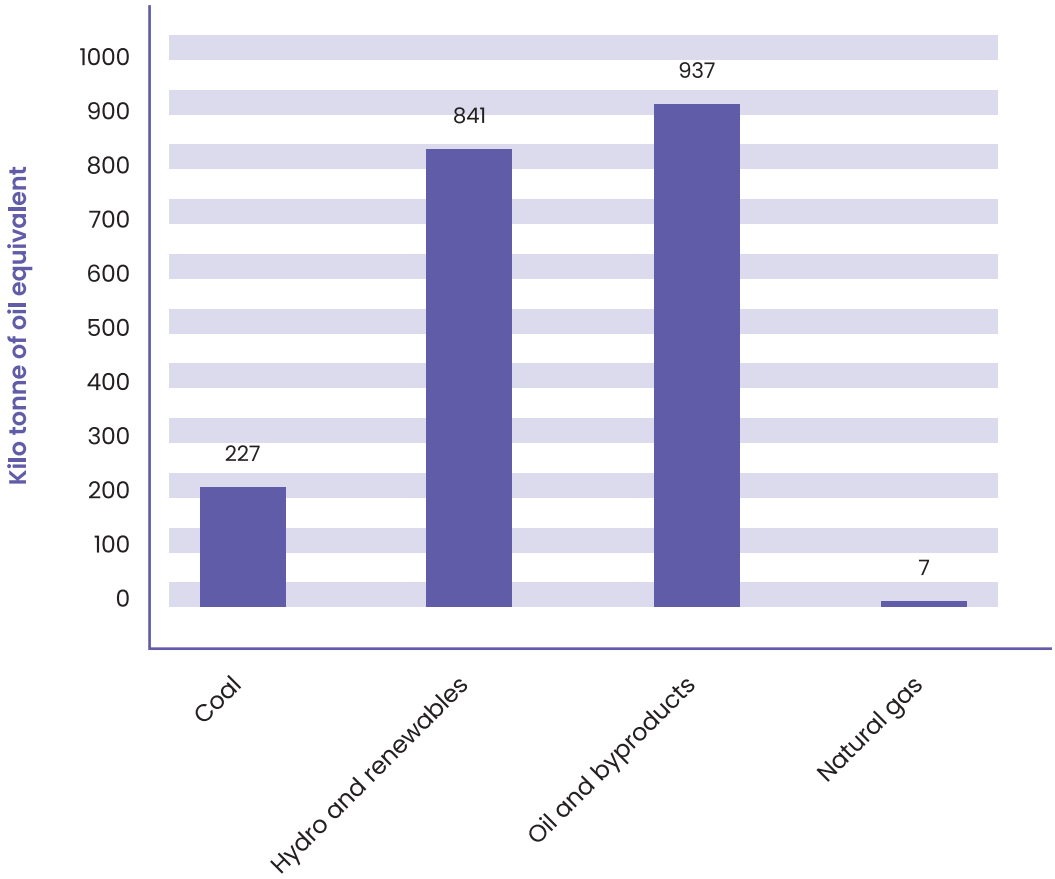


Figure 14: **Final energy consumption.**

Source: Eurostat 2022.

A more detailed analysis of final energy consumption provides an overview where the industrial sector consumes approximately 447 ktoe, the transport sector 678 ktoe, and other sectors, including services, households, agriculture, and fisheries, consume 889 ktoe.

3.3.2 Hydropower

Regarding hydropower and renewable energies, during 2022 as the base year, it is reported that the total domestic production of electricity achieved was 7,002,645 MWh, of which 3,859,730 MWh was produced by plants owned by the public company KESH sh.a., and 3,142,920 MWh was produced by other plants.

The electricity production realized by KESH sh.a. for the year 2022 accounts for 55.11% of the total electricity production in the country, while electricity production from other producers accounts for about 44.89%. Figure 15 below provides an overview of the country's energy balance over the period 2010-2022.

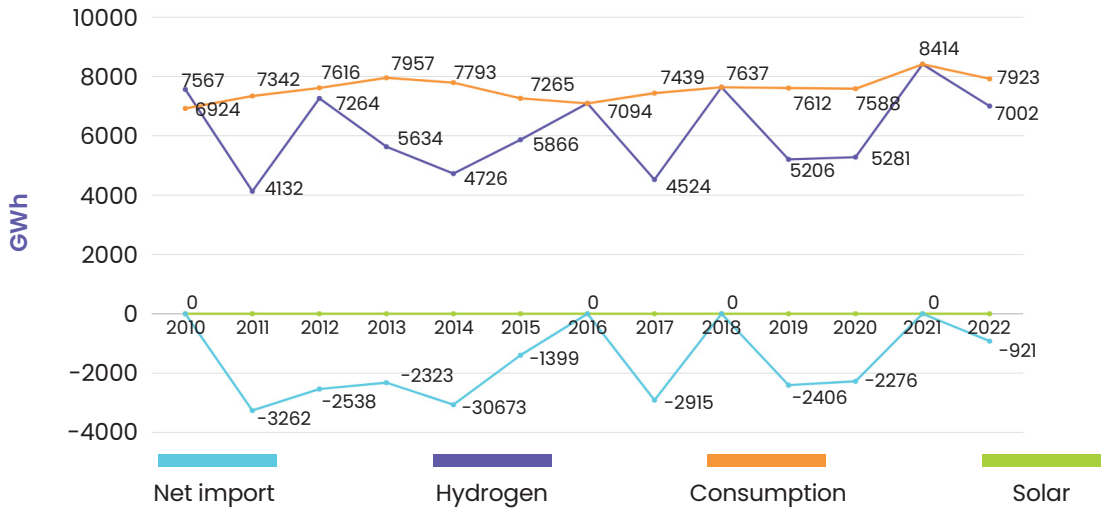


Figure 15: **Energy balance 2010-2022.**

Source: ERE 2022

Based on the data reported by the licensees, the year 2022 is considered a relatively good hydrological year from the perspective of energy production. This is due to the fact that the production achieved this year, at 7,002 GWh, is 861 GWh more than the average electricity production for the period 2009 – 2022.

Electricity consumption for the year 2022 reached 7,923,713 MWh, as highlighted in Graph 3. The lowest recorded electricity consumption in our country was in 2007, at 5,767,652 MWh, while the highest electricity consumption was recorded in 2021, at 8,414,836 MWh, which also represents the highest historical consumption in our country. Compared to 2021, there is a decrease in electricity consumption in 2022 by 491,123 MWh.

Hydropower decreases in dry years or in seasons with little rainfall, so the annual energy that Albania can produce is variable and unpredictable. For example, in 2020 it was 5.3 TWh; in 2021 it was 8.9 TWh, and in 2022 it was 7 TWh. On average, the consumption demand is 7.5 - 8 TWh, and the country typically has a minimal energy deficit of 30% during the year.

In the Vjosa basin, 59 hydropower plants were planned, which were licensed between 2000-2022. However, for the purposes of this study, only the hydropower plants that discharge into the Vjosa River have been considered—45 hydropower plants, of which 3 contracts are under construction (5 HPPs), 12 are operational, and 28 are awaiting approval (MIE: 2022).

The operational hydropower plants are located in the tributaries of the Vjosë River, while the most affected appear to be the rivers of Çarshovë and Langaricë. These hydropower plants have a small capacity and are all connected to the distribution system - OSSHE.

Specifically, the total installed capacity in MWh for the Vjosa Basin is only 11.3 MWh, which constitutes just 0.44% of the total installed capacity in the country for 2022. However, if we compare the planned capacity in the basin with the total planned capacity in the country, the Vjosa Basin would represent a potential of 261.7 MWh or 28% of the planned potential to be developed in the country (see Figure 16 below).

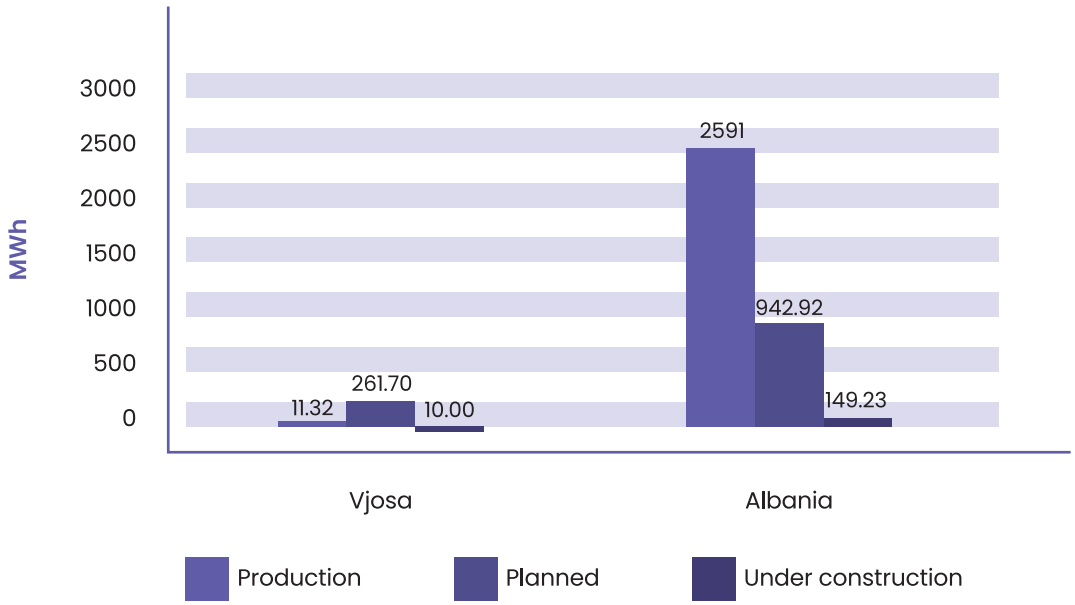


Figure 16: **Installed and Planned Hydropower Capacity in the Country.**

Source: ERE, MIE, 2022

In this overview of the country's energy and in light of the designation of the Vjosa Valley as a National Park, the hydropower potential of the basin will need to be replaced with other renewable energy alternatives (solar energy, wind energy, geothermal energy). Focusing on these renewable energies would contribute to a more stabilized and secure energy supply at a lower cos
However, on the other hand, the Albanian government also has three carbon-based energy projects in the Vjosë area to address the energy shortage, as follows:

1. **A 97 MW oil-fired power plant,** valued at $112 million, located north of Vlora, constructed in 2005: The project was supported by a loan of $74.5 million (the remainder was invested by KESH, the Albanian Energy Corporation). The government's prolonged discussion about converting the oil-fired power plant into a gas-fired power plant has not yet been realized, and the plant is not operational.

2. Licenses for hydrocarbon exploration in **Block 4 by Shell Albania,** which were previously granted by the Albanian Government and cover the areas around the Vjosa Valley. There is still uncertainty regarding the current hydrocarbon potential and the potential impacts these projects may have on tourism and the environment of the area.

3. **A floating thermal power plant in Vlora.** The contract between KESH and Excelerate Energy is another government project aimed at addressing the energy emergency created by the Russia-Ukraine conflict. However, the power plants had not operated a single day by the time this report was prepared, due to the improvement in the supply situation and the easing of the energy crisis. Their presence highlights the vulnerability of the energy sector to the next crisis, short-term planning in the sector, and the nearly 10-year delay in adopting wind and solar energy in the energy system.

3.3.3 Solar Energy

The installed capacity in photovoltaic plants in the country is 23 MW, and the production realized from these plants during the year 2022 was 50,092 MWh (Figure 17). However, ERE reports that the licensing situation in the photovoltaic energy sector has seen a significant increase, with 37 entities licensed by the end of 2023 for an installed capacity of 354 MW.

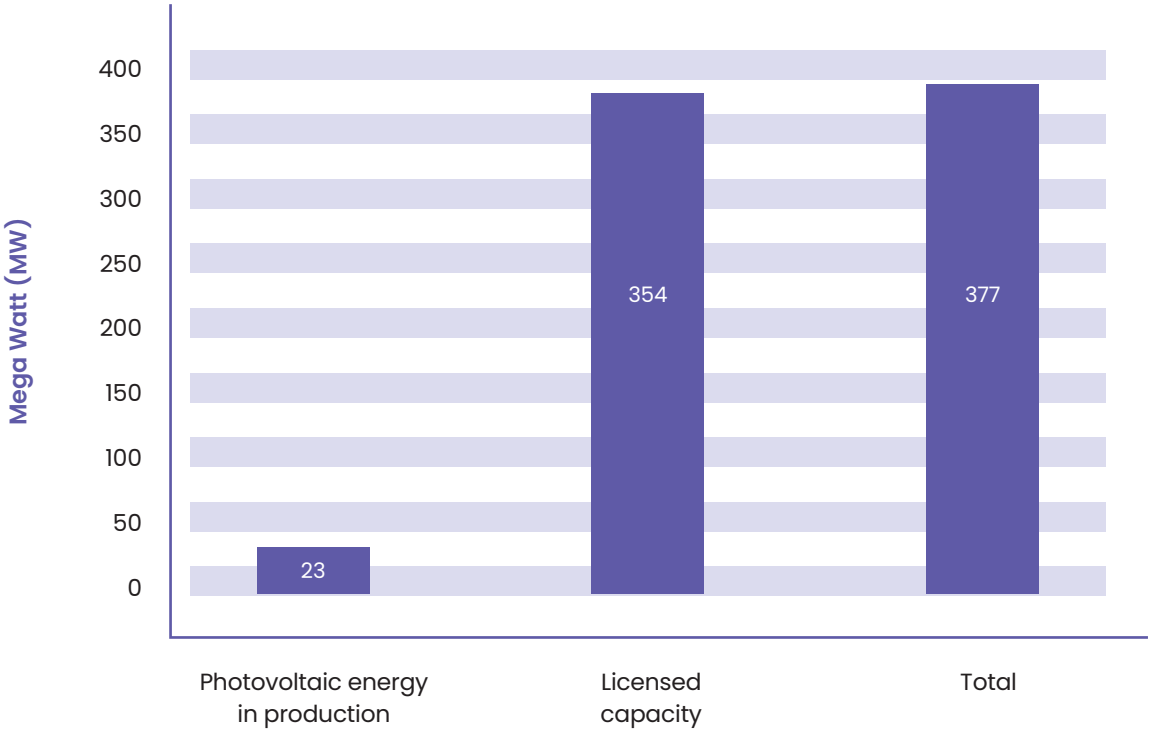


Figure 17: **Installed and licensed PV in MW**

In fact, according to the International Renewable Energy Agency (IRENA) 2020, its scenario proposes an installed capacity of photovoltaic solar energy of 1,074 MW by 2030, with an annual generation potential of 1,697 GWh. Figure 18 shows the areas suitable for the development of photovoltaic solar energy, which are primarily located in the upper part of the Vjosë watershed (Fier, Karavasta, Spitalle, etc.).

These areas have been assessed by combining the potential of resources, distance from protected areas, land use, topography, population growth, and proximity to transmission lines. They are ranked with values between 0% and 100%, and subsequently, the feasibility of hosting a large-scale solar energy project is determined.

In the EBRD study prepared by Golder Associates S.r.l in October 2020, candidate sites were identified using a multi-criteria methodology to determine the most suitable locations that meet spatial characteristics such as minimum size, shape, and orientation. This allowed for the identification of around 350 sites with an area of at least 140 hectares (the minimum for producing 140 MW, chosen as a reference), totalling 161,292 hectares of land with a high degree of suitability for establishing a solar power station.

Figure 18: **Solar Energy Potential**

Source: MIE, 2020

The study concluded that the 10 most suitable locations, with a suitability percentage of 87% to 100%, had a total area of 2,834.9 hectares available for the development of solar energy projects.

Some of these areas extend along the Vjosë River (Figure 19), specifically in the Drinos Valley, in Memaliaj, in the territory of Selenicë, the confluence of Shushicë and Vjosë, and near the Pishë Poros Nature Reserve. The upcoming wind energy auction is scheduled for June 2024 for a capacity of 300 MW, which is being supported by SECO Switzerland.

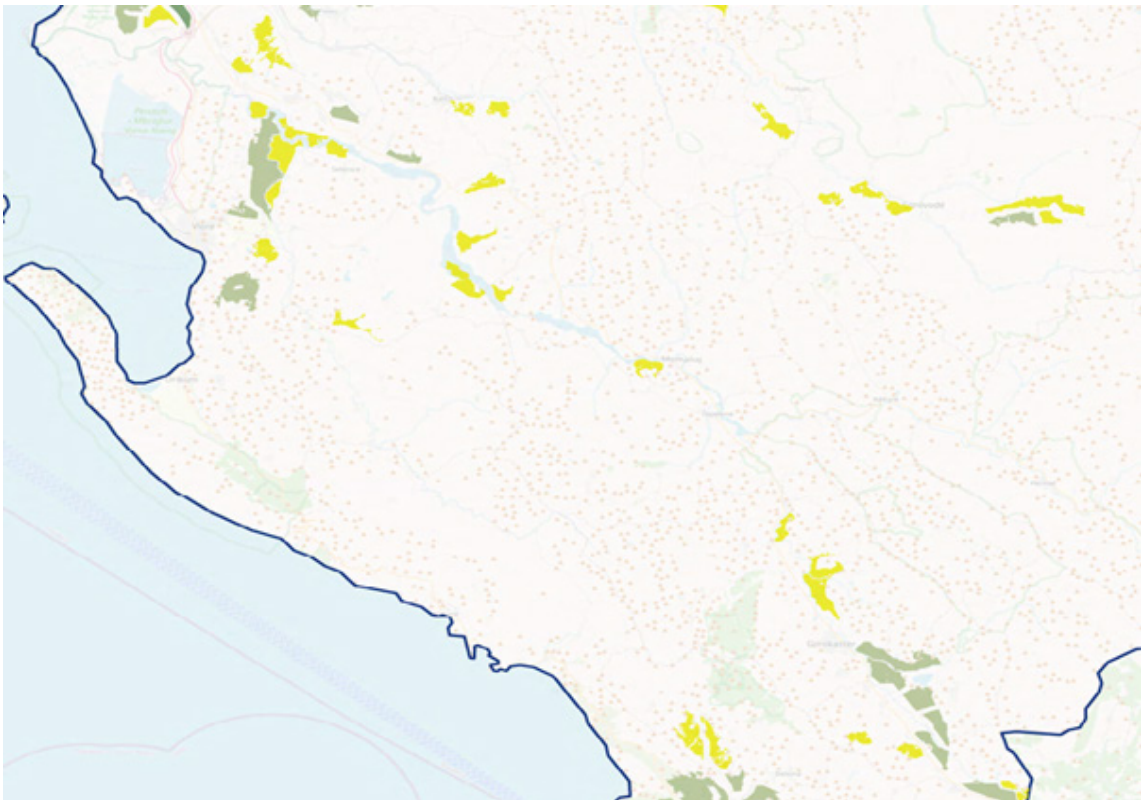


Figure 19: **Positioning of Solar Energy Potential in the Vjosa**

This will increase the total licensed capacity in the energy sector as follows (Table 8):

Table 8: **Positioning of Solar Energy Potential in the Vjosa**

Number of Projects in 2023	Output	Licensed	Location
12	23 MW		Fier, Bilisht, Korce
37		354 MW	Fier, Korce, Lushnje, Erseke, Bilisht, Banjë, Vau i Dejës
Total	**23 MW**	**354 MW**	**= 377 MW**

Meanwhile, in the Vjosa Valley, there is a pilot project called 'Solar Project in Kutë,' an innovative project in Albania as it is the first community project for generating solar energy by installing a solar panel system to supply electricity to five public buildings in the village: the Health Center, the School, the Cultural Center, the Administrative Unit, and street lighting. The Solar Energy in Kuta is a successful initiative launched by EcoAlbania and its international partners Euronatur and RiverWatch in 2020. The initiative has raised funds for the implementation of solar energy in the village of Kuta—one of the communities in the Vjosa Valley that would be affected by the Poçem hydropower plant. See more: *https://ecoalbania.org/solar-ne-kute-nis-punen-projekti-i-pare-komunitar-ne-shqiperi-per-prodhimin-e-energjise-diellore/?lang=en*

3.3.4 Wind Energy

Albania currently does not have installed wind energy plants. However, according to the Ministry of Infrastructure and Energy (MIE), since the implementation of the support scheme for wind energy tariffs, 70 applications have been received for the construction of wind farms with capacities up to 3 MW. Of these, three have been authorized for construction with a total capacity of 9 MW, qualifying for wind energy tariff support (MIE, 2019).

At the end of 2020, a tender was opened for wind energy with a capacity of 150 MW, limited to projects with a minimum capacity of 30 MW and a maximum capacity of 75 MW. 25 months after the publication of the call, in 2023 the Ministry of Infrastructure and Energy (MIE) selected 3 winning bids for an installed capacity of up to 222.5 MW.

This increased quantity further enhances the possibility of energy diversification beyond hydropower. However, unlike other solar energy auctions where the state provided land at €1/m², in this auction, the private sector will have to find the land themselves, while the state will only offer a purchase guarantee for 15 years at the respective prices, according to Table 9.

Table 9: **Licensed Wind Energy Projects.**

Company	Capacity	Price	Location
Total Eren (France) & KMV (Albania)	75 MW	44.88/MWh	Tbc
Guris &Mogan Energy (Turkey)	75 MW	74 EUR/MWh	Tbc
Verbund (Austria)	72.6 MW	74.95 EUR/MWh	Tbc
Total Capacity	**22.5 MW**		

On the other hand, the country has a competitive wind potential of up to 7,400 MW under a low capital scenario (IRENA, 2017). The IRENA study proposes an installed wind capacity of 616 MW by 2030, with an annual generation potential of up to 1,794 GWh (IRENA, 2020a). Figure 20 shows the areas with the highest potential for wind energy development, including those in the Vjosa Valley.

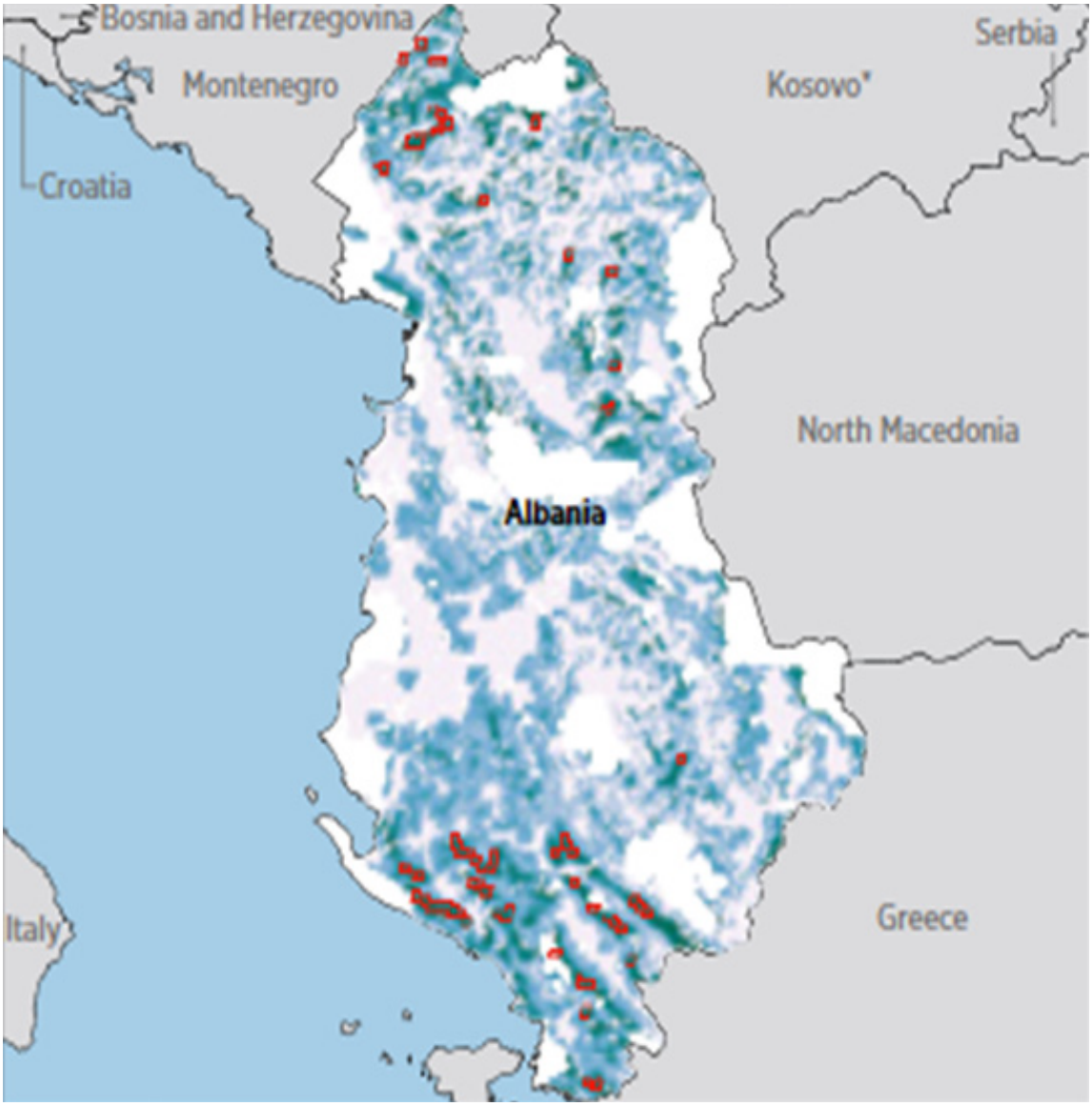


Figure 20: **Solar Energy Potential in Albania**

Source: MIE, 2020

The Vjosa Valley has a high potential for this type of energy, but there is a lack of detailed analysis or significant zoning for these alternative energy sources, particularly regarding where and how much electricity can be produced. The construction/ installation of renewable energy sources without proper planning and in an uncontrolled manner could pose a threat to the Vjosa River National Park.

3.3.5 Geothermal Energy

Albania is in the early stages of geothermal assessment. However, as in other Southeastern European countries, only low-enthalpy geothermal resources are present in the country. Maximum temperatures up to 80°C can be found in the south of the country near the Greek border (Bënjë Thermal Springs) and in the northeast. Most of Albania's geothermal resources are located in the Kruja Geothermal Zone, which extends from the Adriatic Sea in the north of Albania and continues southeast through the country towards the Konitsa area in Greece. Within this zone, carbonate reservoirs contain a calculated geothermal energy potential of 5.9x10^8 to 5.1x10^9 gigajoules (Frasheri, 2015). Due to the low-enthalpy resources, the geothermal potential for electricity production is not feasible and is more suited for heating applications.

3.4 Hydropower and Renewable Energy: Policies and Legal Framework

3.4.1 Key Policy Developments

Prior to the onset of the energy crisis in 2021, energy policies in Europe were oriented towards an optimistic forecast for renewable energy under the programme of the Green Deal. To accelerate the growth of renewable energy and achieve more ambitious climate goals, the European Commission published the 'Fit for 55' package and proposed increasing the renewable energy share in the EU from 32% to at least 40% by 2030. This policy was aimed at setting the European Union on a path to zero greenhouse gas emissions, toward climate neutrality by 2050. Member states will need to update their National Energy and Climate Plans (NECPs) during 2023-2024 to reflect new national goals and identify supporting policies.

Policies and the legal framework in the field of energy, and renewable energies in particular, are very dynamic and subject to frequent changes at both the European level and within the Energy Community, of which Albania is a member.

Albania has developed the National Energy Strategy (NES) 2018-2030 through Decision No. 480 dated 31.07.2018, which outlines its energy development based on supply security and resource optimization to meet needs, with the main objective being the sustainable development of the economy. Table 10 presents the targeted objectives in the NES and the corresponding indicators up to 2030.

Table 10: **Strategic Energy Objectives for 2030**

Description	Starting Point 2015	Objectives 2030
Losses in the Distribution Network	31.4%	10%
Losses in the Transmission Network	2.2%	1.7%
Energy Revenues	90%	98%
Share of Domestic Primary Energy Resources in TPES	47.5%	52.4%
Share of Renewable Energy in TPES	32.5%	42%
Share of Biofuels in Total Energy Consumption in Transport	3.5%	10%

In July 2021, Albania submitted the first draft of the National Energy and Climate Plan (NECP 2030) as part of the commitments made by the country within the Energy Community, the Green Deal, and the Paris Agreement. The NECP is an integrated document aimed at reflecting the energy and climate objectives outlined in the Nationally Determined Contribution (NDC) Report. The Secretariat of the Energy Community has provided its recommendations for improving this plan, which Albania needs to address in a revised plan, pending implementation.

The revised NDC report presents a higher target for reducing total emissions by 20.9% compared to the Business as Usual (BAU) scenario, representing a reduction of 6,674 ktCO2e from 2021 to 2030.

Specifically, the obligations arising from the NECP 2030 are: developing renewable energy and energy efficiency action plans, strengthening and operationalizing institutional aspects, and implementing auditing, certification, and financing measures, including transitioning from hydropower production in consideration of the energy crisis (Table 11).

Table 11: **Climate and Energy Objectives and Indicators**

Description	Renewable Energy Indicators	CNAPRES 2020	NES 2030	NECP 2030
Renewable Energy	Renewable Energy in Final Energy Consumption by 2030	38% [2020]	42%	54.4%
Energy Efficiency	Reduction in Final Energy Consumption Compared to the Scenario with Existing Measures	2.2%	2.2%	1.7%
Greenhouse Gas Emissions	Reduction (%) Below 1990 Levels	31.4%	31.4%	Reduction of Emissions by 18.7% Compared to BAU

The NECP has specified the new capacities that need to be built for renewable energy production in order to achieve national objectives. Specifically, these are divided into two blocks: a) the investment block that will be supported by the feed-in tariff mechanism, and b) the investment block that will be supported through open auctions and Contracts for Difference (CfD), as shown in Figure 21 below.

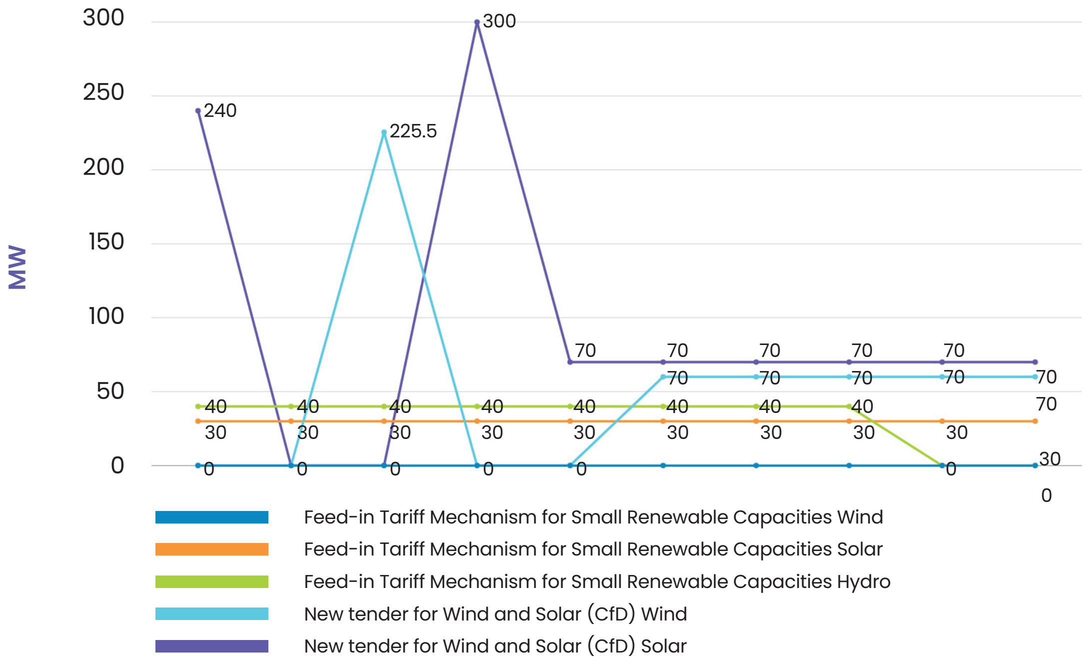


Figure 21: **Capacity Needed by 2030**

Source: NECP 2030. Calculated by E. Qendro

As shown in Figure 21 above, the first block plans to build approximately 320 MW of hydro power and 300 MW of wind power by 2030, benefiting from the feed-in tariff system.

In the open auction block, the NECP has forecasted licensing more than 1 GW (1260 MW) of energy by 2030. Notably, the licensing graph does not follow the plan, where last year 222.5 MW of wind energy was licensed. In July 2024, an auction is expected to open for 300 MW of solar energy, with the maximum capacity of a single plant ranging from 100 to 140 MW. Although the Ministry of Infrastructure and Energy (MIE) has prepared a study on the potential and a possible map, it remains up to investors to select the geography of the investment and the land: private or public.

3.4.2 Legal Framework

In March 2023, Albania approved amendments to the Renewable Energy Resources Law (24/2023), aligning it with the EU Renewable Energy Directive (2018/2001). This law establishes an "incentive scheme" as a direct government commitment to meet the targets for the use of energy generated from renewable sources. The law includes provisions for the approval of the National Energy and Climate Plan, which outlines the objectives for renewable energy, total energy consumption in the country, including electricity, transportation, heating, and cooling.

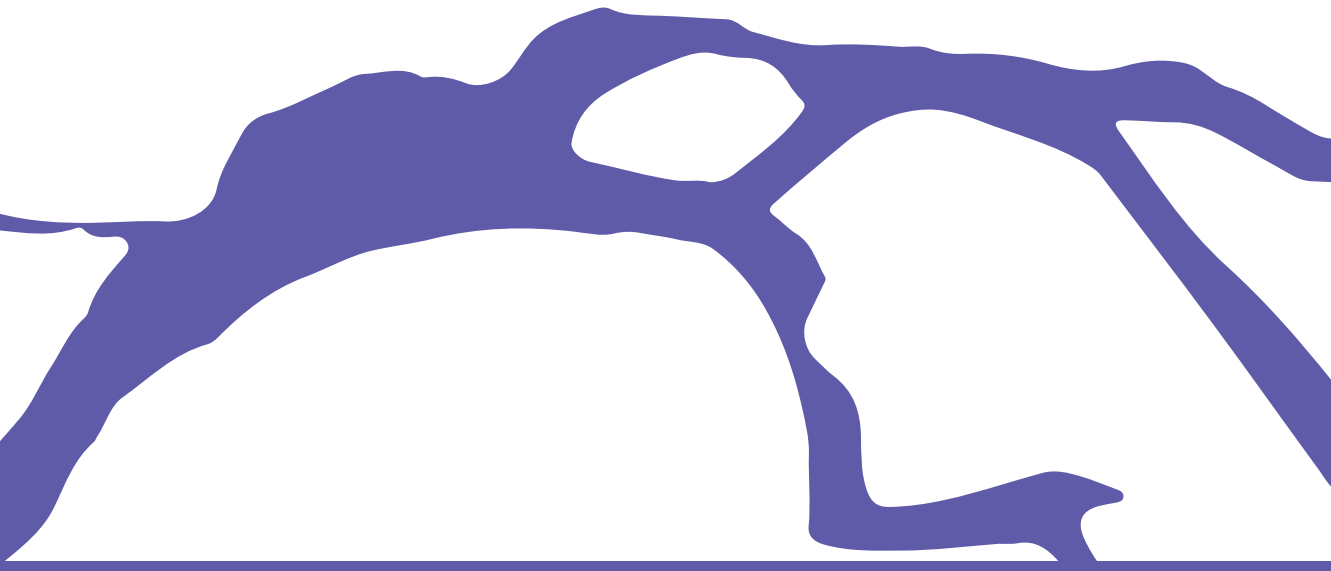
The new law introduces several innovations in the electricity sector, including the provision for the establishment of energy communities. These communities are granted the right to produce, consume, and sell renewable energy, including through power purchase agreements.

On the other hand, the law permits renewable energy self-producers (wind or solar) to have a maximum capacity of 500 kW. These self-producers are entitled to produce, consume, store, and sell excess renewable electricity. This includes engaging in bilateral agreements, working with electricity suppliers, and entering into commercial agreements with counterparts, without facing discriminatory or disproportionate charges. The rights and responsibilities of renewable self-consumers are defined through a Council of Ministers' Decision (VKM), which now allows self-producers to use net metering on an annual basis.

These positive legislative changes came into effect on January 1, 2024, enabling annual net metering for all self-producers. Private households and small to medium-sized enterprises, under the new law, can qualify as self-producers of solar and wind energy up to 500 kW. These changes have resulted in a total amount of self-produced energy reaching 120 MWh, with a total number of self-producers at 1,250, of which 61% are located in the Tirana-Durres region.

These positive legal developments signal promising prospects for the Vjosa River Basin, where numerous private entities or communities could organize themselves into energy communities for self-production of energy from solar panels and wind turbines.

During the preparation of this technical document and the consultations conducted as part of the ESPID4Vjosa Project in Permet, Gjirokastra, Vlore, and Tepelena in March 2023, the author noted that the most extensive knowledge among the residents is about hydroelectric plants, as well as their concerns regarding these plants.



3.5 Analysis of Shortcomings

The push towards the use of renewable energies and their integration into the energy market has received increased focus in recent years in Albania. In the renewable energy sector, there are several dynamics and initiatives noted, including efforts to optimize consumption, projects to support households installing solar panels (with 70% grant for investment costs), and energy-saving measures in public institutions.

The analysis of shortcomings in this technical report is summarized into three main pillars based on the analysis of the legal framework, development policies in the sector, and local meetings:

1. Shortcomings of a developmental and institutional nature;
2. Shortcomings related to local capacities, knowledge, and awareness regarding renewable energy;
3. Shortcomings related to challenges and opportunities for access to financing for renewable energy sources.

3.5.1 Deficiencies in the nature of development policies

1. **Lack of a Comprehensive Energy Master Plan.** Although Albania has a National Energy Strategy 2030, a National Energy and Climate Plan 2030, and a Gas Master Plan, which aim to guide the energy sector in Albania, it is still unclear what the limit of new production capacities will be, where they will be developed, and how these energy plans align with local development plans. The Master Plan will need to consider climate change scenarios, the declining population trend, and water shortages in 2030 and 2050.

2. **Lack of Renewable Energy Zoning in the country.** The northeastern region is an area for hydropower plants, while the Fier region (Sheq, Dermenas, Darëzezë, etc.) has effectively become a solar zone in the country. However, the reality on the ground is not reflected in a national or local policy regarding the zoning of energy plans in the country. Considering that one of the key criteria for solar energy is land and favorable solar radiation, planning is guided only by technical energy aspects and not by spatial development considerations.

3. **Lack of Local Energy and Climate Plans in the Vjosa Valley.** The municipalities along the Vjosa Valley do not have energy and climate plans, which serve as a key instrument for planning the achievement of energy objectives in this sector.

3.5.2 Deficiencies in the nature of local capacities and knowledge regarding renewable energies.

4 **There is a deficiency in institutional capacities and local human resources regarding renewable energies.** Although the national orientation is towards a broad wave of investment in renewable energies, this has not been matched by local policies and technical support at the local level. Energy discussions continue to be technocratic, focused on supply and production. Today, there is a need for a more human-centered approach to energy, and for defining and clarifying the role, involvement, and function of "energy communities."

5 **Lack of technical programs for youth and other age groups in the field of energy.** Although the country has focused on the development of tourism, ecotourism, nature, cultural, and gastronomic tourism, today, trends and demands are shifting towards renewable energies, as well as employment opportunities in this sector. Along the Vjosa River basin, there are two universities (Vlora and Gjirokastra) and technical vocational schools, but there is a lack of programs in the field of energy.

6 **Lack of information and awareness about energy and women at the national and local levels.** In Albania, as well as elsewhere, the energy sector is dominated by men. There is a marked absence of programs, campaigns, social activism, and media coverage addressing the significant gender gap in this field. There cannot be energy communities with a lack of women.

3.5.3 Deficiencies related to the challenges and opportunities for access to financing for renewable resources.

7 **There is a lack of information and limited awareness among key actors** including institutions, businesses, and communities, regarding the administrative and financial mechanisms that encourage or facilitate investments in the field of renewable energy production.

8 **There is a negligence by the private and public sectors regarding existing financing opportunities and the involved actors.**

3.6 Response for Addressing the Measures That Need to Be Taken.

Development, legal, and institutional policies.

Lack of a comprehensive energy master plan.

Measure 1

In this regard, a comprehensive plan should be developed that gathers data in the energy sector, such as the definition of renewable energy, the potential of energy resources, and historical statistical trends, along with both qualitative and quantitative information, in a clearly formulated and evidence-based development pathway that will allow for decision-making and sustainable sector development.

Lack of Local Energy and Climate Plans in the Vjosa Valley.

Measure 2

Development of local climate and energy plans.

In line with the national NECP (National Energy and Climate Plan), municipalities can develop their local plans, which will help them set local energy objectives, investment opportunities, and foreign financing. On the other hand, municipalities can also develop plans for electric vehicle infrastructure within their territories.

Lack of zoning for renewable energies in the country.

Measure 3

Development of in-depth studies for renewable energy areas in the Vjosa Valley.

While aspects of hydropower have been analyzed in detail, there is a lack of analysis and zoning for the economic potential of solar and wind resources in the country. This hinders the development of policies for setting achievable objectives and planning a cost-effective energy system in the region.

Measure 4

Identification of suitable areas for wind and solar parks.

Municipalities should analyze their territory and determine the economic potential in this regard, becoming stakeholders through public-private partnerships. This approach would generate revenue, create jobs, invest in youth, and become an economic pole by increasing local financial autonomy.

Technical capacity

There is a deficiency in institutional capacities and local human resources regarding renewable energies.

Measure 5

Increase in energy education regarding the benefits of renewable energy throughout the Vjosa Valley.

In general, energy knowledge is poor throughout the Vjosa River basin for many stakeholders. This is not in the context of technical or engineering expertise, but rather a lack of overall assessment and understanding that the human relationship with energy is changing. Citizens need to know more about the form of energy, efficiency, savings, and their energy suppliers. Therefore, the role of civil society is essential in creating energy communities. For example, the successful model of Solar Panels developed by EcoAlbania in the village of Kuta, Mallakaster, has enabled solar energy production by installing an independent electricity generation system to power five public buildings and the street lighting in the village of Kuta.

Lack of technical programs for youth and age groups in the field of energy.

Measure 6

Support for human resources, their training, and expertise is necessary to maximize and ensure the development of local economies.

Local institutions and the private sector need to collaborate with the academic sector and vocational training sector to develop training, development, and certification programs for energy managers and mid-level technicians. The industrial schools in Gjirokastër and Vlora are two poles that can play this role.

Lack of information and awareness about energy and women at the national and local levels.

Measure 7

Development of dedicated programs for promoting paid scholarships and 'Women in Energy' internships.

This measure aims to raise awareness among women about the opportunities offered by the energy sector and simultaneously prepare them for the job market by providing scholarships, internships, and training. All of these will result in an increase in the number of women professionally prepared for energy-related work and a reduction in the gender gap in this sector in the region.

Promotion, awareness and financing

There is a lack of information and limited awareness among key actors about existing financing opportunities and the involved stakeholders.

Measure 8

Development of real public hearings with local residents, local authorities, and Water Basin Councils.

Local authorities should implement the legal framework (including the principles of the Aarhus Convention) that mandates public hearings for projects or decisions that significantly affect local communities. They should also use official channels to disseminate information about these hearings, ensuring that their development sites are accessible to everyone. Additionally, the Vjosa River Basin Council can contribute by exchanging information about projects in the Vjosa Water Basin and acting as an intermediary between local authorities and the community. They can and should provide expert support during the hearings and keep transparent records of the discussions.

There is negligence by the private and public sectors regarding existing financing opportunities and the involved stakeholders.

Measure 9

Raising awareness about energy efficiency among local communities to promote sustainable practices and reduce energy consumption.

Although this option seems like the simplest solution, in practice it requires significant time and resources. To raise awareness about energy efficiency in local communities, it is necessary to start with organizing educational seminars, partnering with local organizations, and creating informational materials. Another tool would be providing pilot energy audits for demonstration purposes and organizing community events to engage schools and youth groups. To encourage involvement and incentive programs, it is important to include local media for broader coverage. Project models and special guests can help and enhance credibility in these efforts.

7 Conlusions

1. Albania is recently witnessing **a shift in its strategic energy orientation** towards solar and wind energy, with an investment potential of up to 1.2 GW.

2. Although renewable energy (solar and wind) are decentralized resources, in Albania this phenomenon is **entirely political and centralized** by the central government.

3. There is **a low level of awareness among small businesses** and enterprises in the Vjosa Valley region about investment opportunities in self-production or energy efficiency amid the energy crisis and the government's plans for liberalizing the energy market.

4. Local governance in the 11 municipalities of the Vjosa Valley should be **activated and take a proactive role** in informing businesses, creating energy communities in the area starting with pilot zones. The energy community in Kute could serve as a pilot and, subsequently, actions could be extended throughout the valley.

5. The academic community in the Vjosa Valley (Vlora and Gjirokastra) should collaborate with **research projects and technical institutes to establish a training program** for young people in the field of renewable energy, with a particular focus on women and girls. This would enable the creation of new job opportunities in a growing sector, reduce youth depopulation in the area, and narrow the gender gap.

These conclusions aim to address the challenges and strengthen the development of renewable energy in the Vjosa Valley by incorporating a decentralized approach, informing local businesses, and involving academic collaboration and civil society for the youth.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Save our Vjosa!
DON'T CUT THE STREAMS OF VJOSA
FUNDI I TROFTES
MOS SHKATËRRONI LUMIN E FUNDIT TË TIGËR TË EVROPËS
MOS NA MERRNI
UJI ESHTE JETË! MOS NA E MERRNI
Hands off of Vjosa
Mos prekni Vjosën
DON'T ABUSE WITH YOUR POWER TO ENRICH
UNË E DU
VJOSËN

4

Natural Resources in the Vjosa Basin

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4.1 Introduction

This technical report presents the results of a social-economic analysis conducted in the Vjosa River. The boundaries of the Vjosa River are specified in the Decision of the Council of Ministers, no. 155. Dated. 13.03.2023. The actual surface of the National Park is 11,822 hectares. The analysis focuses on understanding the social dynamics, stakeholder interests, and KIAergies. Most of the steps are in the energy sector (77) and the transport sector (71), followed by LUCF (Land-Use Change and Forestry), Agriculture (17), and four cross-sectoral measures. On the other hand, there have been initiatives and support for open investments in different sectors of the economy.

International (EU-law) standard concerning natural resources management (EU-Natural Resources Directive)

This part of the technical report provides a short overview of the main EU legislation about forest, water and soil resources. In Albania the General National Climate Change Strategy and Plan and the Climate Change Mitigation Plan are important steps towards achieving a cost-efficient low-carbon economy since in 2019 it was ranked 141 out of the 218 countries in per capita global greenhouse gas emissions.

According to the International Monetary Fund report (2022) the agricultural sector (30 %) is its largest contributor, followed by transport (15 %) and industry (12%), and is obliged to reduce total emissions by 20.9 % in 2030. On 11 December 2019 the European Commission presented The European Green Deal – a roadmap for making the EU's economy sustainable by turning climate and environmental challenges into opportunities across all policy areas and making the transition just and inclusive for all. Building on the European Green Deal, it has six priority objectives:

1. Achieving the 2030 greenhouse gas emission reduction target and climate neutrality by 2050
2. Enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change
3. Advancing towards a regenerative growth model, decoupling economic growth from resource use and environmental degradation, and accelerating the transition to a circular economy
4. Pursuing a zero-pollution ambition, including for air, water and soil and protecting the health and well-being of Europeans
5. Protecting, preserving and restoring biodiversity, and enhancing natural capital (notably air, water, soil, and forest, freshwater, wetland and marine ecosystems)
6. Reducing environmental and climate pressures related to production and consumption (particularly in the areas of energy, industrial development, buildings and infrastructure, mobility and the food system)

The EU's environment policies seek to promote sustainable development and environmental conservation for current and future generations. There is a significant relationship between agricultural and environmental policy. The main instruments related to agriculture are the Common Agricultural Policy (CAP) and the EU strategy "From Farm to Fork". CAP seek to adopt and strength the EU's agri-food and forestry sectors, environmental sustainability, and the well-being of rural areas in general. It aims to achieve the following strategic objectives:

1. Fostering the competitiveness of agriculture;
2. Ensuring the sustainable management of natural resources, and climate action;
3. Achieving a balanced territorial development of rural economies and communities, including the creation and maintenance of employment.

Also European Commission has published the New EU forest strategy for 2030 which was published in 2021. This new strategy aims to improve the quantity and quality of EU forests by the initiatives of the European Green Deal and builds on the EU Biodiversity Strategy 2030.

So the EU directives are focused in some directions as follows:

In the field of water quality:

- The Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework in the field of water policy, as amended by Decision 2455/2001/EC and Directives 2008/32/EC, 2008/105/EC, 2009/31/EC and 2013/39/EU. This directive not only manages and protects water at the national level, but also works with neighboring nations to guarantee excellent water quality across shared rivers.

- Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration; This Directive evidences that groundwater as an important natural resource that should be safeguarded against degradation and chemical contamination. This is especially significant for groundwater-dependent ecosystems and the use of groundwater in water supplies for human use.

- Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC. The alignment of this Directive searches the adoption and updating of the national air pollution control programs, including the analysis supporting the identification of policies and measures.

- Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy;

- Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse

Forests and Agriculture

- Decision No. 529/2013/EU of the European Parliament and of the Council of 21 May 2013 on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities.

- Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides.

- Regulation (EC) No. 2152/2003 of the European Parliament and of the Council of 17 November 2003 concerning monitoring of forests and environmental interactions in the Community (Forest Focus);

- Commission Regulation (EC) No. 1737/2006 of 7 November 2006 on removal of detailed rules for the implementation of Regulation (EC) No. 2152/2003 of the European Parliament and of the Council concerning monitoring of forests and environmental interactions in the Community;

- Regulation (EC) No. 2152/2003 of the European Parliament and of the Council of 17 November 2003 concerning monitoring of forests and environmental interactions in the Community (Forest Focus);

- Council Regulation (EEC) No. 1615/89 of 29 May 1989 establishing a European Forestry Information and Communication System (Efics), OJ L 165, 15.06.1989, p. 12 - 13;

- Council Regulation (EEC) No. 2158/92 of 23 July 1992 on protection of the Community's forests against fire,OJ L 217, 31.07.1992, p. 3 – 7, amended by Commission Regulations (EEC and EC) No. 1170/93 of 13 May 1993, No. 1460/98 of 8 July 1998, No. 1727/1999 of 28 July 1999, Council Regulation (EC) No. 308/97 of 17 February 1997, and Regulations of the European Parliament and the Council No. 1485/2001 of 27 June 2001 and No. 805/2002 of 15 February 2002;

- Council Regulation (EC) No. 2173/2005 of 20 December 2005 on the establishment of a FLEGT licensing scheme for imports of timber into the European Community;

- Regulation (EU) No. 995/2010 of the European Parliament and of the Council of 20 October 2010, laying down the obligations of operators who place timber and timber products on the market.

Circular Economy and Waste Management:

Circular economy systems preserve the added value of products for as long as possible and reduce waste. Since the widespread adoption of the concept of sustainable development by many actors in the economy, making it the main objective of various countries, and while the world economy is facing a slowdown in economic return, different ideas and opinions are appearing to make a difference. In 2015, European Commission adopted the first action plan on the circular economy which was followed and by the EU Directive.

- Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment

On the other hand, Waste management is considered one of the key elements of the EU's environmental policy.

- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste;

- Directive 86/278/EEC on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture, as amended by Directive 91/692/EEC, Regulation (EC) 807/2003 and (EC) 219/2009;

- Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators, as amended by Directive 2008/12/EC, Directive 2008/103/EC and Directive 2013/56/EU, and Commission Decisions 2008/763/EC, 2009/603/EC, 2009/851/EC;

- Directive 94/62/EC of European Parliament and Council Directive of 20 December 1994 on packaging and packaging waste as amended by Regulations (EC) 1882/2003 and (EC) 219/2009 and Directives 2004/12/EC, 2005/20/EC and 2013/2/EU;

- Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT) as amended by Regulation (EC) 596/2009;
- Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of life vehicles

- Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003, on waste from electrical and electronic equipment (WEEE), as amended by Directive 2003/108/EC of the European Parliament and of the Council of 8 December 2003;

- Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste, as amended by Regulations (EC) 1882/2003 and (EC) 1137/2008 and Directive 2011/97/EU;

- Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC and Regulation 596/2009/EC, as amended by Commission Decision 2009/335/EC, 2009/337/EC, 2009/358/EC, 2009/359/EC and 2009/360/EC;

- Regulation (EU) No 1257/2013 of the European Parliament and of the Council of 20 November 2013 on ship recycling and amending Regulation (EC) No. 1013/2006 and Directive 2009/16/EC;

- Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste, as amended by Regulations 1379/2007/EC, 669/2008/EC, 219/2009/EC, 255/2013/EC and 308/2009/EC, 664/2011/EU and 135/2012/EU;

- Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE);

- Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, as amended by Directives 2012/50/EU, 2012/51/EU, 2014/1/EU and 2014/16/EU.

In the field of Nature Protection:

Together with the EU Biodiversity Strategy and EU Directives, European Commission has adopted a comprehensive, ambitious, long-term plan for protecting nature and reversing the degradation of ecosystems.

- Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds (codified version);

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitat and of wild fauna and flora, amended by Directive 97/62/EC, Directive 2006/105/EC and Regulation (EC) 1882/2003;

- Council Regulation EC/338/97 of 9 December 1996 on the protection of species of wild fauna and flora by regulating trade therein;

According to Act 70 of the Stabilisation and Association Agreement (SSA) Albania must transpose the national legislation with the EU legislation. Albania has transposed 95% of the national legislation with the EU (National Plan for European Integration 2023-25). EU laws on natural resources are mainly focused on four Aquis Chapters: Chapter 11: Rural Development; Chapter 12: Policies for Food Safety, Veterinary and Plant Protection; Chapter 13: Fishery; Chapter 27: Environment.

The Ministry of Agriculture and Rural Development has transposed the majority of the Legislation related to natural resources, and they are working on the action plan for future changes. The Acquis for Fishery does not require changes in national legislation. The majority of the legislation on natural resources is related to Chapter 27 and according to the National Plan for European Integration 2023-25 it is transposed to 95% of the national legislation.

Horizontal regulation, water and air quality, waste management, biodiversity preservation, industrial pollution control, risk management, genetically modified organisms, chemicals, noise, and forests are all covered by EU environmental legislation. The implementation of the EIA (Environmental Impact Assessment) and EIA (Strategic Environmental Assessment) Directives has advanced in the area of horizontal legislation in Albania. Approved by Law No. 128/2020 fully aligning Directive 2014/52/EU of the European Parliament and of the Council of April 16, 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, the amended Law 10440/2011 "On Environmental Impact Assessment" or the new Law on Environmental Impact Assessment was created.

Considerable endeavors are required for the execution and monitoring of policies, particularly concerning waste management, water and air quality, and climate change. Albania should, in particular, approve a national road map on utilities aggregation and implement the new water services law and plan for water supply and sewerage 2021–2030. Notably expand its primary national water agency funding resources and implementation capabilities.

The implementation of a new national disaster risk reduction strategy and action plan, the establishment of flood vigilance mechanisms and risk management plans in all river basins, the enactment of the National Strategy on Climate Change and related Action Plans on mitigation and adaptation, the adoption of the requisite legislation, and the implementation of its integrated National Energy and Climate Plan are all essential steps that must be taken. In order to comply with its obligations within the Energy Community, Albania must undertake a number of immediate actions. These include the review and improvement of environmental and strategic impact assessments on existing and planned projects, plans, and programmes, with particular attention paid to those in the hydropower, construction, tourism, transport, and mining sectors. When it comes to concrete projects before construction and operation, the application of the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) Directives needs to be greatly enhanced, especially for HPPs.

Additional work is required to adhere to the air quality regulations, specifically in expanding and enhancing the air monitoring infrastructure. The execution of the national air quality strategy from 2014 is still not implemented, and the 2019 national air quality management plan lacks an operational monitoring system. Its primary focus is on transportation measures, with the issue that air monitoring remains non-compliant with EU air quality standards. Ongoing efforts are being made to implement the action plan for air quality and Directive (EU) 2016/802 regarding sulfur content in specific liquid fuels, while the initiation of the implementation of Directives 94/63/EC about the regulation of volatile organic compound (VOC) emissions and 2009/126/EU on stage II petrol vapor is pending. The waste management legal framework requires significant efforts to achieve full alignment, as it is only partially aligned. There is a lack of focus on reaching the EU 2030 recycling targets within the waste management policies. In March 2022, Albania implemented a law prohibiting the use of specific types of plastic bags, demonstrating partial compliance with the single-use plastics directive. The alignment on water quality is still not fully achieved, and there is a need to pass two laws related to water resources and marine waters in 2022. Specific plans for implementing the Drinking Water Directive and Urban Wastewater Treatment Directive are being prepared, and significant investments will be necessary to meet the requirements.

Alignment with the acquis in the field of nature protection, in particular the Habitats and Birds Directives, is advanced. Good progress was made with the adoption of the set of rules for the management of revenues generated by fees paid in Protected Areas, and the establishment of the Special Fund for Protected Areas. While Albania has demonstrated a degree of preparedness in addressing climate change, its compliance with EU regulations remains constrained. At COP26 in November 2021, Albania committed to achieving climate neutrality by 2050, aligning with the EU's goals. Furthermore, Albania became a participant in the Global Methane Pledge. Albania updated its National Determined Contribution (NDC) to enhance its efforts in October 2021, boosting the emissions reduction target for the 2021-2030 period from 11.5% to 20.9%. Additionally, Albania adopted a National Energy and Climate Plan (NECP) in December 2021, demonstrating considerable progress. However, the emission reductions foreseen for 2021-2030 in the NECP go up to 18.7%, lower than the pledge in the revised NDC.

4.2 GAP analysis

Current situation and issues

The natural resources within the Vjosa basin have historically served as the primary source of income for its residents. How these resources are utilized is closely tied to both tradition and the level of technological investment. Various agricultural practices employed over time have had detrimental effects on the ecosystem.

One of Albania's most significant economic sectors is agriculture; it accounts for around one-fifth of the country's GDP, and employs about 37% of all Albanian workers (INSTAT, 2021). There are over 41,000 registered farmers in Albania, of whom 15,500 are located in the Vjosa valley, or 37.8% registered farmers are located in the Vjosa valley. Agriculture has a role in the development of the nation's regional character. The Vjosa valley is primarily focused on this industry, where the area planted with cereals in 2018 was 46,900 ha or 33.5%, out of 140,000 ha across Albania, with the Fier region occupying the majority of the space with 34,600 ha or 24.7%. From the 289,500 ha of field crops (potatoes, beans, vegetables, etc.) planted nationwide in 2018, 70,300 ha, or 24.3%, were planted in this region, where Fier once again dominates with an area of 56,000 ha, or 19.3%. Out of the 675,200 tons of grains produced nationwide, 233,300 tons, or 34.5%, are produced in this region. Over 2.3 million tons, or 26.9%,of field crops were produced in Fier in 2018, with 2,921,100 tons, or 34.19%, produced in the Vjosa valley out of 8,543,100 tons produced nationally. When compared to the national average of 3.69 tons per ha, Vlora's cereal production of over 4 tons per ha puts it in the first place. Fier also outperforms the national average (3.79 tons per ha) (Muço, 2020).

The above-mentioned details affirm that agriculture is very present in the Vjosa region and an important industry for the economy. This is also emphasized by Muço (2020), in the first part of his socio-economic analyses of the Vjosa valley. He presents the current situation, and based on research, states that the Vjosa valley and its surroundings, from an economic point of view, are oriented towards the agriculture-livestock farming and tourism sector.

These repercussions include a decrease in forested areas, unregulated grazing, and occurrences of fires caused by activities like collecting firewood and clearing land for new pastures. Furthermore, the environment has suffered from contamination of soil and water due to the use of chemical fertilizers and pesticides, as documented in Sovinc (2021). The result has been a reduction in biomass and the depletion of agricultural biodiversity, primarily due to land usage, often driven by personal consumption and uncontrolled grazing on natural pastures, which is favored for its cost-effectiveness in livestock feed. However, despite being a major contributor to the local economy, agriculture poses a threat to the future Vjosa Wild River National Park. Three distinct aspects of agriculture's impact on Vjosa are land use, pollution, and water abstraction. If these factors are not adequately managed and controlled, the effects could be equally detrimental. In terms of land use, the lower regions of Shushica and the lower portion of the river basin—where agriculture seems to be more intensive—are most affected.

As previously mentioned, Vjosa is distinct for its high levels of biodiversity. Several studies show that biodiversity is positively linked to the resilience of agricultural systems, helping to protect against environmental shocks and providing key ecosystem services for agricultural production (Rahawarin, 2017, in Shumka et al., 2022). Furthermore, the findings of questionnaires disseminated throughout the region demonstrate that the indicators cited by respondents are compatible with research undertaken by other organizations that emphasize the need to conserve the Vjosa basin. Figure 22 highlights the importance of water resource management in Vjosa basin.

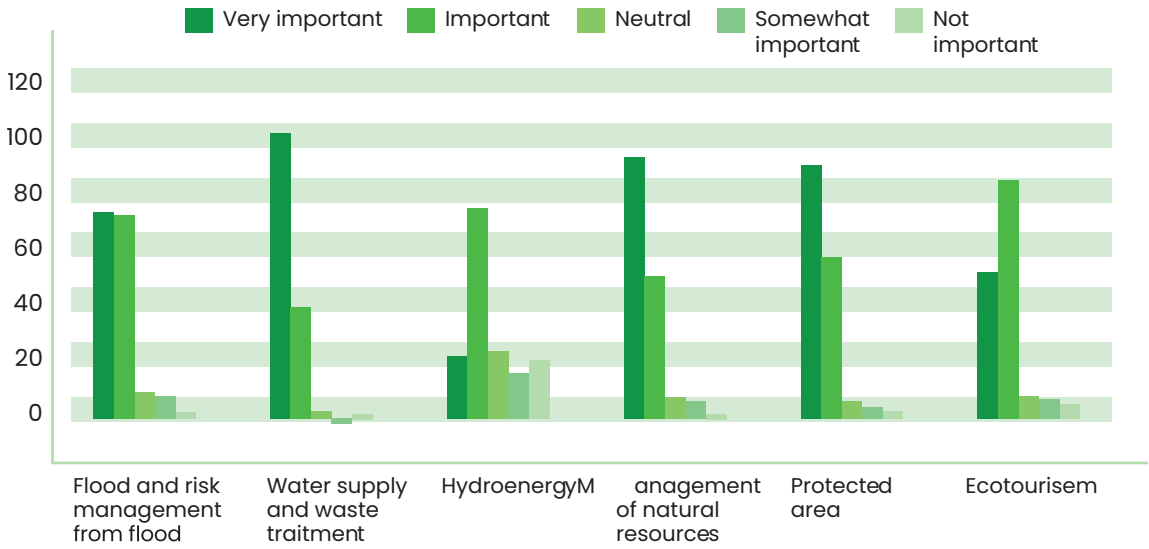

Figure 22: **Importance of water resource management in Vjosa basin**

Source: Questionnaires 2023.

The need of conserving the Vjosa basin through the treatment of waste water caused by human activity seen in each group's replies is an important feature in our study of the questionnaires responses. It should also be highlighted that the questionnaire results follow a consistent pattern when it comes to the importance of efforts supporting the conservation of the Vjosa basin as a protected area and natural resource management. Furthermore, interest groups have prioritized the preservation of the basin above profitability, preferring tourism and hydropower over profits. Above all, quantitative measurement of sustainability is necessary for sustainable development in order to gauge the degree of sustainability attained, monitor progress towards sustainability, and offer data and direction for projects aimed at solving the problem under study (Kates et al., 2005). Different measurement techniques and tools, such as indicators, standards, audits, indices, accounting parameters, assessment evaluation, or even other reporting systems, have been developed in response to the need to assess sustainability (Pintér, 2005).

River basins are at the center of emerging issues pertaining to food production, socioeconomic development, climate change, and water security. Consequently, the broad goals of addressing needs and managing uncertainties that jeopardize river basin sustainability must be acknowledged and included in sustainable management practices. Water basins are essential to development that is sustainable tourism. In Figure 23 the importance of activities by water availability in the lives of residents of the Vjosa Valley is presented.

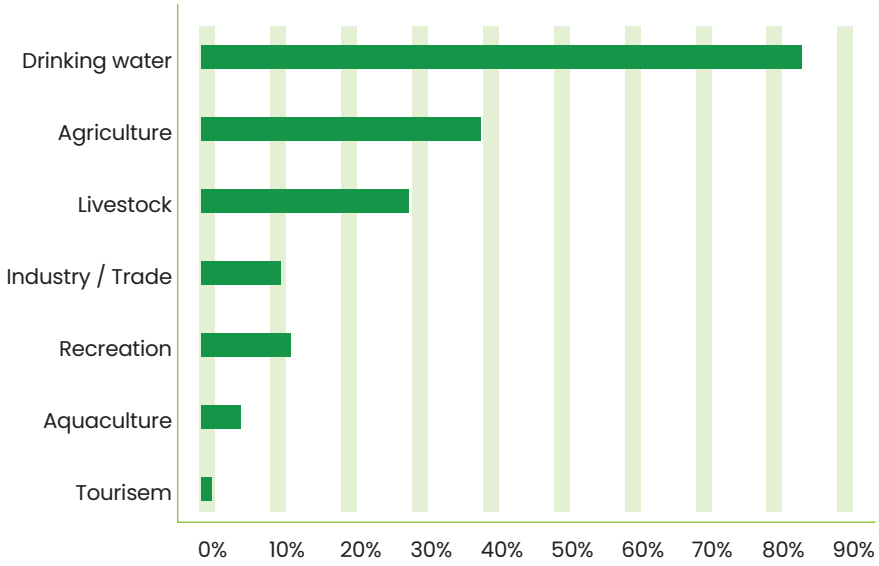

Figure 23: **Water and Its Important Activities in the Vjosa Valley Communities**

Source: Questionnaires 2023.

River sustainability is closely tied to the idea of sufficiency, which requires adequate flow, quality and transport of sediments to maintain ecological health. The river basin must be resilient enough to withstand natural and human forces while also being able to recover and return to its original state. To achieve the necessary needs for well-being, communities must have enough access to the river's services, such as water supply and sanitation, recreational activities, and water transportation. Untreated wastewater and urban trash are thrown straight into the Vjosa River's surface waters, resulting in increased pollution. Përmeti, Tepelena, Memaliaj, and Këlcyra are among the worst afflicted cities, with no adequate wastewater treatment or waste management systems. Recent studies have revealed that these urban areas are deficient in the necessary infrastructure for wastewater treatment, resulting in the introduction of deleterious contaminants into the river system (Marku, 2019). The absence of adequate treatment facilities allows for the direct release of domestic sewage, industrial effluents, and other pollutants into the river, thereby exacerbating existing water quality issues (Nuro et al., 2020). It has been demonstrated that the prevalence of waterborne diseases is greater in areas where untreated sewage is discharged into water bodies (Peters et al., 2021).

Moreover, the deterioration of water quality has a detrimental impact on aquatic ecosystems, resulting in a reduction in biodiversity and the health of fish populations, which are crucial for the local economy and food security (Schiemer et al., 2020). In Figure 24 the responsibility of pollutants in the Vjosa Valley are depict.

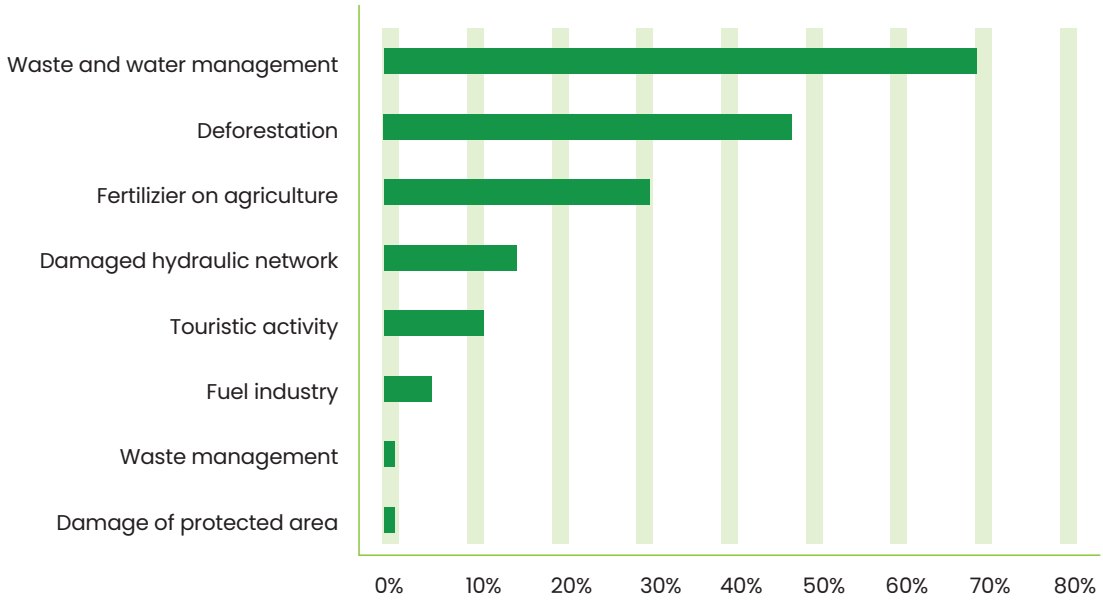

Figure 24: **Responsibility of pollutants in the Vjosa Valley**

Source: Questionnaires 2023.

Based on the data gathered from questionnaires in 2023, it is evident that the area with the highest pollution levels is also one where residents and those with dependable information from the base confirm waste and water management by 70%. At 48% of the total, deforestation contributes to air pollution and significant soil erosion. It is also the second largest source of pollution on basin. Starting from 2016, the stations of Novosela, Kafaraj and Pish – Poro were presented with an amount of indicators above the recommended concentrations of Cl, Mg, Na, SO4, as such they were classified as areas with high salinity (AKM, 2017).

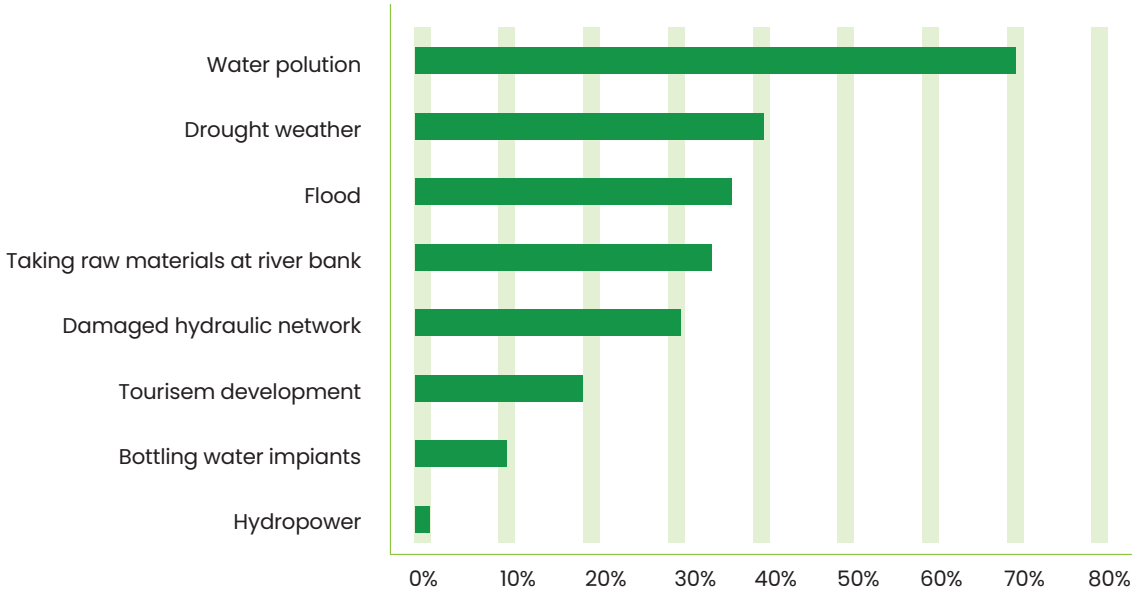

Figure 25: **Reasons that water sources are endangered**

Source: Questionnaires 2023.

As indicated by responses to the questionnaire from residents and other specialists, critical situations have been identified that pose a risk to water sources due to prolonged exposure. Flooding, waste management, and water pollution have all been identified as prior survey questions that contribute to water pollution. Other crucial factors, as drought, raw material removal from riverbanks, and hydraulic network degradation, should be considered in order to prevent future contamination of the Vjosa Valley's water sources. The valley of Vjosa wording agricultural lands suitable for viticulture, horticulture, vegetables, and other crops in the valley of Përmet, the field of Tepelena and Memaliaj to Qesarat, the hilly area of Mallakastra cultivated with olives, vineyards, and orchards, and the plain area Cakran-Frakul-Levan-Bishan-Novolë.

"Some existing activities identified as threats to the area, such as water and gravel extraction for industrial use and intensive agriculture, should be regulated in the future protected area to prevent disruption of the hydrological regime" (Sovinc, 2021). Figure 26 shows the institutional responsibilities of water resources management in Vjosa Basin.

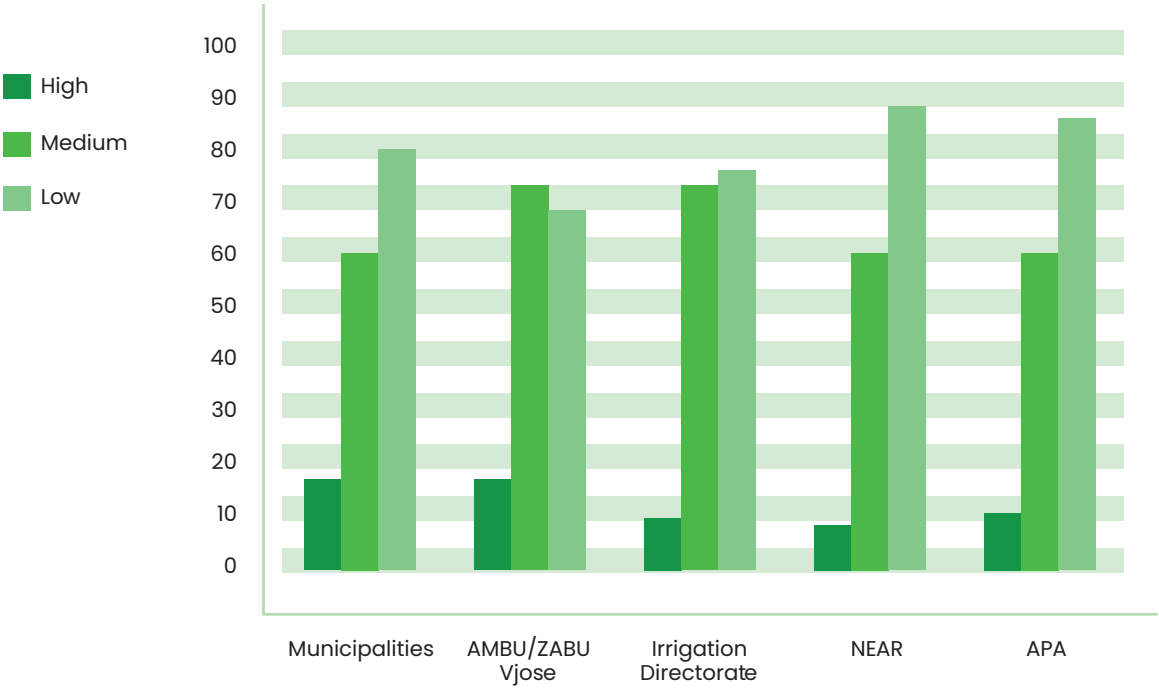

Figure 26: **Institutional responsibilities of water resources management in Vjosa Basin**

Source: Questionnaires 2023.

The Vjosa River system is a natural ecosystem in dynamic equilibrium, governed solely by natural forces. The floodplains of the Vjosa River in Southern Albania are considered one of the most magnificent river ecosystems in Europe. Natural disturbances, such as floods and droughts, are integral to the functioning of the Vjosa River ecosystem. These events can rejuvenate habitats, promote biodiversity, and facilitate nutrient cycling. For instance, periodic flooding can create new habitats for aquatic organisms and enhance the productivity of floodplain ecosystems (Xhaferri et al., 2020).

The resilience of the Vjosa River system to such disturbances is a testament to its dynamic equilibrium. There are several unique or rare natural, historical or cultural resources at the national, regional and even global/universal scales, and traditional activities and intangible cultural values that show relevant or significant examples of harmony and integration between socio-economic activities and natural landscapes. The biggest threats to the Vjosa Wild River National Park, mapped in all 12 municipalities along the main river and the tributaries, are urbanization, mining and quarrying, hydropower, industry, and agriculture. Even in line with the results of the questionnaire processing, a number of current and valid recommendations were discovered.

Figure 27 summarizes the recommendations by stakeholders in the Vjosa basin.-

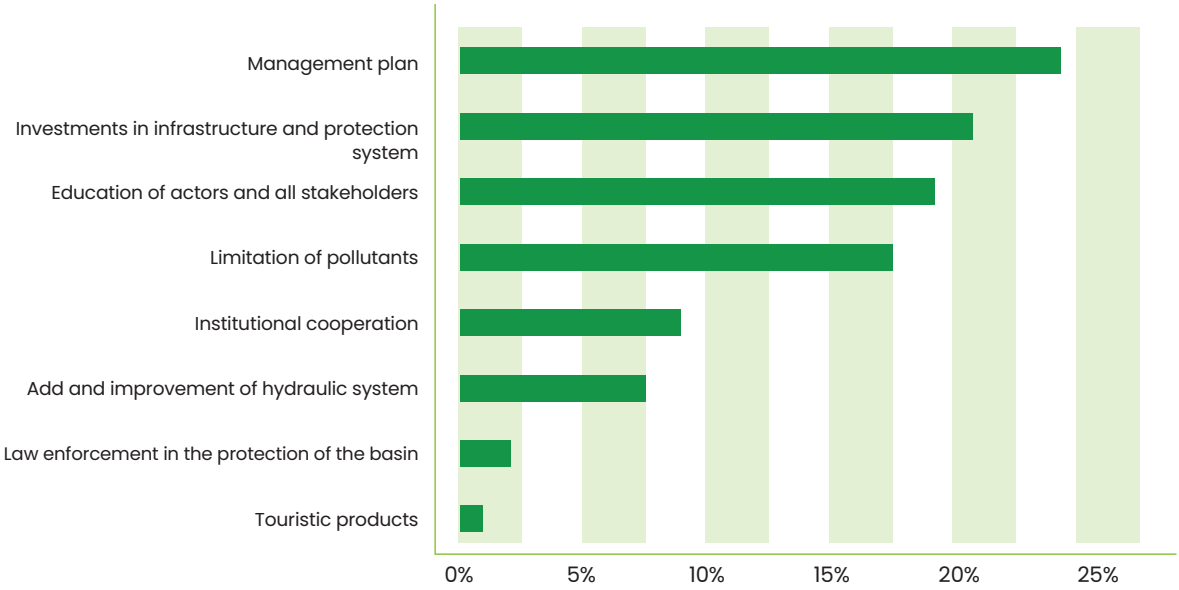

Figure 27: **Summary of the recommendations by stakeholders in the Vjosa basin.**

Source: Questionnaires 2023.

It was observed that resolving the key concerns with the basin's enhancement and preservation is linked to the management plan as a whole, even according to the questionnaire findings, which were grouped for comparable replies. The remaining suggestions are of lesser consequence and address more specific issues. However, they also support the management plan, basin protection infrastructure investments, and the simultaneous education of all parties involved, including interest groups and transient users of natural resources, as well as pollution limits for every human activity.

In many parts of the Basin River, a high level of erosion occur. It is complicated to model soil erosion due to the numerous factors which accelerate the erosion process (Zhu et.al. 2013). In terms of the basin management plan, a few of the issues found on the map along the Vjose River's path have been categorized as hot spots. According to the administrative division, the hot spots are identified by the municipality, clearly demonstrating institutional accountability in the Vjosa basin's management plan.

1. Përmet municipality Livestock grazing has resulted in a loss of forest mass in the Petran - Çarshove, Kosina-Piskovë-Kuqar's agricultural lands are intensively farmed, with varying cultivars of vegetation rotated annually. Chemical fertilizers and plant sprays also exacerbate the erosive process of humus loss and water pollution.

2. Kelcyre Municipality. Reduced forest mass in Kelcyre-Ballaban as a result of livestock grazing. Gryka e Këlcyra at the Trebeshina bottling plant for drinking water.

3. Libohovë Municipality. Loss of forest mass due to livestock grazing.

4. Gjirokastër Municipality. Glina with the Glina drinking water bottling plant. Bulo - Subash intensive use of agricultural land and reduction of forest mass due to grazing by livestock.

5. Tepelenë Municipality. Uji i Ftohte Tepelena bottling plant. Subash – Tepelene area lost of forest mass due to plant diseases and grazing of livestock. Luzat, the company for the production of asphalt with river inert and bitumen. Shelgu with loss of forest mass due to the wrong investment of institutions in its reforestation. Majkosh, the company for the production of asphalt with river inert and bitumen.

6. Memaliaj Municipality. Memaliaj - Kalivac intensive use of agricultural land and reduction of forest mass due to grazing by livestock.

7. Selenicë Municipality. The use and extraction of bitumen in the mines of Selenica, the use and extraction of oil in the wells of Romës. Mifol-Dëllinjë intensive use of agricultural land and reduction of forest mass due to grazing by livestock.

8. Mallakastër Municipality. Kute village intensive use of agricultural land

9. Vlorë Municipality. Management of the protected landscape Vjose - Nartë. Intensive use of agricultural land. Vlora Airport (Territory Development Plan of Vlora Municipality). Plan for setting up a salt treatment center (SPA and Relax).

10. Fier Municipality. Poçem with the Fontana drinking water bottling plant. Romes with oil and bituminous sand extraction.

Challenges for agricultural land, pastures, and forests are related to:

1. Limited agricultural and livestock production. These are a consequence of the existence of small farms with a high level of fragmentation and low yields.

2. The continuous use of agricultural lands, has interrupted the natural vegetation (Leiter&Toromani 2022).

3. Loss of soils due to erosion and lack of vegetation cover, especially along the river banks.

4. Loss of biomass due to livestock grazing, indiscriminate logging and deliberate burning.

5. Lack of environmental education on sustainable strategic policies of natural resources.

6. Water pollution from agricultural treatments with chemical fertilizers and pesticides, which will bring irreparable consequences if not addressed in a timely and professional manner.

7. Lack of up-to-date breeding plans for forest and pasture economies, where managers of the forest fund plan holding capacities and determine the extent of use such as for grazing, cultivation of aromatic medicinal plants, tourism, utilization of secondary materials, etc.

8. Inadequate coordination between central and local authorities in monitoring and managing forests and pastures remains an issue. The power division, particularly concerning monitoring, is unclear. The delegation of responsibilities lacks a prior allocation analysis and lacks adequate funding for functions like forest management, agriculture, and fire protection. (MTM 2020)

The extraction of minerals often causes environmental pollution in nearby areas due to gases which are sometimes emitted by burning, and due to waste spills or discharges into surrounding water bodies. The risk of Vjosa water being polluted at its middle section is high due to the discharge of polluted urban waters along the river and in its lower section due to mineral exploitation activity of Selenica region (Sovinc 2021). Mining activities involving limestone and siliceous stones result in water pollution due to solid waste. However, the most significant impact is the irreversible physical damage inflicted on the environment during the extraction process. As a result, all living organisms are forced to vacate the area due to noise pollution and dust.

Challenges regarding mineral resources and their use:

1. Preservation of the natural landscape and maintenance of the natural processes. It is a fact that the process of extracting minerals is accompanied by damage to the landscape and vegetation that covers the surface in that region and causes extreme changes in the transportantion of the sediment and erosion processes.

2. Achieving a reduction of water pollution, derived from the extraction of minerals from the underground.

    - Latest scientific approaches / state of science concerning natural resources risk management

Moreover, the construction work on a commercial airport in the Vjosa-Narta protected landscape causes significant concern about threats to the environment, the habitat, migratory birds and other living species.

3. Challenges and key issues

    - Identification what important aspects according to European standards are not addressed up to now (by national and international experts).

From the questionnaires, several opinions from the Albanian experts are remarked as a summary:

1. Auron Tare for water resources management topic was concerned with the hydropower constructions in the Nivica region.

2. Vasillaq Nikolla agriculture expert thinks that agriculture is one of the main pollutants in the area so it is necessary for the intervention of the local government.

3. Aulona Veizi, Deputy Mair of Vlora municipality thinks that the Local Action Group 'Vjona" has addressed all the problems of the Vjose Narte region through the Local Development Strategy. This strategy needs to be taken into consideration as well in the Vjosa management plan.

4.3 Management response to address the issue

Ecosystem services approach present opportunities to build constituencies for biodiversity and ecosystem management with communities who live in rural areas, but who may not be willing to support biodiversity conservation (Ingram J. et al 2012). Each ecosystem has its economic value, which refers to the value of an asset, which lies in its role in attaining human goals, be it spiritual enlightenment, aesthetic pleasure, or the production of some marketed commodity (Barbier et al., 2009). Nature-based solutions leverage natural processes to address environmental challenges while simultaneously promoting biodiversity conservation and enhancing human well-being (Lushaj et al 2024).

Traditional biodiversity conservation approaches may not have worked here due to the villagers' suspicions about hidden conservation agendas; a suspicion not uncommon in this part of the world where some people believe conservationists have prioritized the needs of species over the needs of extremely poor people (Berghöfer et al, 2017).

Issue 1

Water pollution

Measure 1

Treatment of polluted waters using processing plants before they are discharged into the river. This measure should be focused on the main cities which are located mainly near the Vjosa river. While for rural areas, this measure can be implemented for a longer period due to the current protection from septic tanks.

Measure 2

Improvement of agricultural practices according to the use of sustainable agriculture. Promoting sustainable agriculture, can only be possible when farmers adopt sustainable agriculture practices.

Measure 3

Prohibition of exploitation of mines as the processing of minerals in them creates pollution of underground water.

Issue 2

Preservation of the natural landscape.

Measure 1

Mines and oil well closure. They affect the environment in the protected areas and damage biodiversity

Measure 2

Livestock grazing with conventional forms. Farmers have to cultivate alfalfa or fodder for animal grazing.

Measure 3

Replacement of the goats with sheep, since goats are the main destroyers of the forests.

Issue 3

Loss of soils due to erosion and lack of vegetation cover

Measure 1

Afforestation of buffer zone near the river bank

Measure 2

The change of agricultural crops in areas classified as hot points by alternative land use as fruit trees.

Issue 4

Limited agricultural and livestock production.

Measure 1

Farmers will invest in organic or semi-conventional crops only if they are a competitive commercial option.

- To break even with existing agriculture methods (conventional), organic crops need to produce returns at least as high as other conventional/ agricultural options for the same area of land considered. In this exercise, a monocrop production plot of 0.1 ha is assumed although it will not be the case in reality. For instance, a management cost (such as weed control) may be incurred but with different type of inputs used, and the variable cost of agriculture may experience changes in type and frequency of used inputs and operational labor. These 'costs' are included in the amount that the organic crop must return.
- For each product should estimated breakeven price and potential performance indicators for nonconventional products

Conclusions

Prevention of the destructive effects on land, water, biodiversity, and natural resources – should be addressed not only by those who work or live in Vjosa Valley but also by relevant interest groups in its vicinity.

1. Develop a management plan for Vjosa water basin through a multi-sectoral approach, that promotes the balanced utilization of water resources in both the agricultural sector and the hydrocarbon industry.

2. Restricting mining activities in the basin requires a comprehensive and critical evaluation of existing licenses and their impacts on the river system. This evaluation should consider various environmental, social, and economic factors to ensure well-informed decision-making.

3. Orient agriculture towards a multi-functional agricultural model which positively affects good management of the rural area, the preservation of the environment and rural identity as well as the increase of employment in the area. This way, integrated farming is encouraged by optimally reducing damage to the environment.

4. Create an enabling condition for livestock food base by establishing forage systems in order to completely eliminate irresponsible grazing of livestock in forests.

5. Support farm families with alternative forms of energy security, avoiding logging.

6. Develop support programs in terms of environmental education through Regional Agency for Protected Areas (RAPAs) in the Vjosa National Park in order to raise awareness at the community level (e.g. by the creation and implementation of a Junior Ranger program).

7. Encourage local communities to create a Local Action Group (LAG) as a long-term solution towards sustainable economic development.

8. Develop joint plans for forest and pastures breeding between institutions at the local and central level. Measures to preserve the environment, ensuring the replacement of the biomass lost due to uncontrolled use of forests.

9. Improve managerial and law-enforcement capacities serving sustainable management of natural resources.

10. Increase necessary capacities of farmers and ranchers in order to inform them about sustainable practices in developing agriculture and livestock through cooperation with the extensive service at the regional directorates of agriculture.

5

Protected areas in the Vjosa Basin

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Executive Summary

The analysis of the management and governance of Albania's protected areas, with a focus on the Vjosa Wild River National Park (VWRNP), identifies critical gaps and opportunities for improvement. The findings, drawn from primary and secondary sources as well as stakeholder input, highlight challenges in governance, implementation and stakeholder engagement, but also emphasize the potential for transformative change.

The lack of a dedicated governing body for the VWRNP and the lack of adequate staff highlight a significant gap in the governance of the VWRNP. Centralized decision-making and poor coordination between agencies hinder effective conservation measures and integrated management.

The current boundaries of the VWRNP exclude important free-flowing tributaries and the wider delta area, jeopardizing the ecological integrity necessary to achieve conservation goals. An extension of the boundaries to meet the authorities' original commitments is imperative.

The 2024 Integrated Management Plan for the VWRNP lacks essential resources, including trained staff, funding and equipment. Conservation measures such as species protection, habitat restoration, invasive species control and species monitoring are not effectively implemented. Ongoing industrial activities such as mineral extraction or the extraction of water and minerals from the riverbed are in conflict with conservation objectives. Tourism in the wider Vjosa Valley can be seen as an opportunity for the development of local communities, but if it is inappropriately planned and managed and allows the construction of buildings and associated transportation infrastructure, it can become the biggest threat to the Vjosa's natural values and biodiversity.

Local communities face problems such as pollution, water scarcity and inadequate park management, which erode trust and support. Therefore, public awareness campaigns are crucial to raise public understanding of the park's biodiversity conservation priorities.

Albanian legislation on protected area is largely in line with international standards, but recent changes to the main national legislation on protected areas risk prioritizing development over conservation. Weak coordination between levels of government and insufficient political commitment hinder policy implementation.

Significant donor assistance provides an opportunity to address governance shortcomings through investment in management, capacity building and ecological restoration. Promoting sustainable tourism and improving pollution control, water management and infrastructure can reconcile economic development with environmental conservation. Improved education and stakeholder engagement are critical to fostering collective commitment to the long-term sustainability of the park.

The summarized strategic recommendations for effective management of the Vjosa Wild River National Park and sustainable development of local communities include:

1. A decentralized governance model, increased inter-agency coordination and partnerships with stakeholders are essential for effective management.
2. Ongoing research and environmental monitoring should support adaptive management and informed decision making.
3. Collaborative efforts between government authorities, local communities and international partners are necessary to preserve the unique landscape of the Vjosa River while balancing human development needs.

5.1 Introduction

Protected areas play a crucial role in the maintenance and protection of the river's ecological character, offering significant benefits from ecological, socio-economic, and regulatory perspectives. Ecologically, protected areas safeguard biodiversity, provide habitat for numerous species and maintain the natural processes that ensure water quality, flood mitigation and climate change resilience (Sustainable Development Goal 13). Socio-economically, these areas contribute to the local economy through ecotourism and sustainable resource use, by supporting livelihoods while preserving the river's natural ecosystem services. From a regulatory perspective, PAs help enforcing environmental laws and guidelines, promoting sustainable development and water resource management in line with national and international environmental standards.

Protected Areas along the Vjosa play a key role in maintaining the ecological balance and supporting the region's biodiversity. These areas act as an essential mitigation against environmental degradation, providing shelter for numerous species while maintaining the hydrological and geomorphological processes that define the river's character.

The report assesses the existing PAs, with particular attention to the recently established Vjosa Wild River National Park (VWRNP) and explores the potential for extending protected areas to incorporate better freshwater ecosystems into protected area systems, a key aspect highlighted by recent global conservation priorities.

The report also examines the legal frameworks that shape the management of the system of protected areas, both at the national level and through the lens of EU integration processes. It identifies gaps in current management practices and proposes strategic responses to effectively address these challenges.

Through detailed analysis and stakeholder feedback, the report aims to identify a pathway forward that respects the Vjosa River's ecological integrity while addressing the local population's economic and cultural needs.

5.2 Methodology

The technical report's methodology is comprehensive, integrating secondary and primary data analyses. It focuses on the unique aspects and challenges of riverine protected areas, specifically the Vjosa Wild River National Park (VWRNP). With its thoroughness, this approach aims to bridge the gap in understanding and managing riverine protection areas in contrast to their terrestrial counterparts.

Secondary data were compiled from a review of national and international legislation pertinent to riverine-protected areas. These insights provide information about the management concerns, the advantages they offer, and the constraints they face. The case studies, in particular, shed light on the peculiarities of riverine ecosystems compared to terrestrial ones and helped frame the potential challenges in transposing terrestrial protected area guidelines to fluvial systems.

Complementing the secondary data, primary data were collected to capture stakeholder perceptions within the Vjosa River Valley region. A structured questionnaire was deployed to gather empirical data from residents, with 162 completed questionnaires contributing to the analysis. The questionnaire was carefully designed to extract relevant information on several key aspects. The main aim is pinpointing critical issues in VRWNP's water resource management. The questionnaire was crucial in recognizing the challenges within the VRWNP as perceived by the local community, such as the impact of water availability on daily life, providing data essential for resource allocation and strategic planning.

The data collected facilitated the assessment of areas most vulnerable to environmental threats, helping to strategically prioritize management efforts within the reserve. In addition, the research detected the primary sources of pollution in the Vjosa River Valley, a step that is fundamental for directing conservation efforts.

Stakeholders' perspectives on various aspects of sustainable water management were also assessed, shaping the integrated approach to the management of VRWNP. Finally, an assessment of institutional effectiveness in water resource protection was carried out as a central aspect of the governance analysis for the park.

The combination of secondary data, primarily legislation reviews, case study analyses, and primary stakeholder data offers a sound methodology for addressing the complexities of managing a riverine-protected area. This approach not only highlights the particularities of the VRWNP within the wider Vjosa River Valley but also allows for a nuanced understanding of stakeholder perspectives.

5.3 Protected areas in Albania and in the Vjosa River Basin

Albania has recently made significant progress in expanding its network of protected areas, from 5.2% of the country's territory in 2005 to 16% in 2014. As of 2022, terrestrial protected areas in Albania covered approximately 18.59% (5,263 km²) of the country's land area, according to the Ministry of Tourism and Environment data.

The presence of numerous protected areas in the Vjosa River Basin, as shown in Table 12, highlights the ecological importance and varied conservation priorities of this region. These areas are categorized under different IUCN protection categories, which serve as a legal and policy framework. In Albania, protected area categories — such as national parks, nature reserves, and others—are generally aligned with the IUCN categories, ensuring consistency in conservation standards and objectives (Sovinc, 2021). This alignment supports the conservation of unique biodiversity and landscapes and facilitates sustainable development, particularly in tourism and related economic activities. Integrating these protected areas into a cohesive network enhances ecosystem connectivity, strengthens resilience, and promotes sustainable practices across the basin.

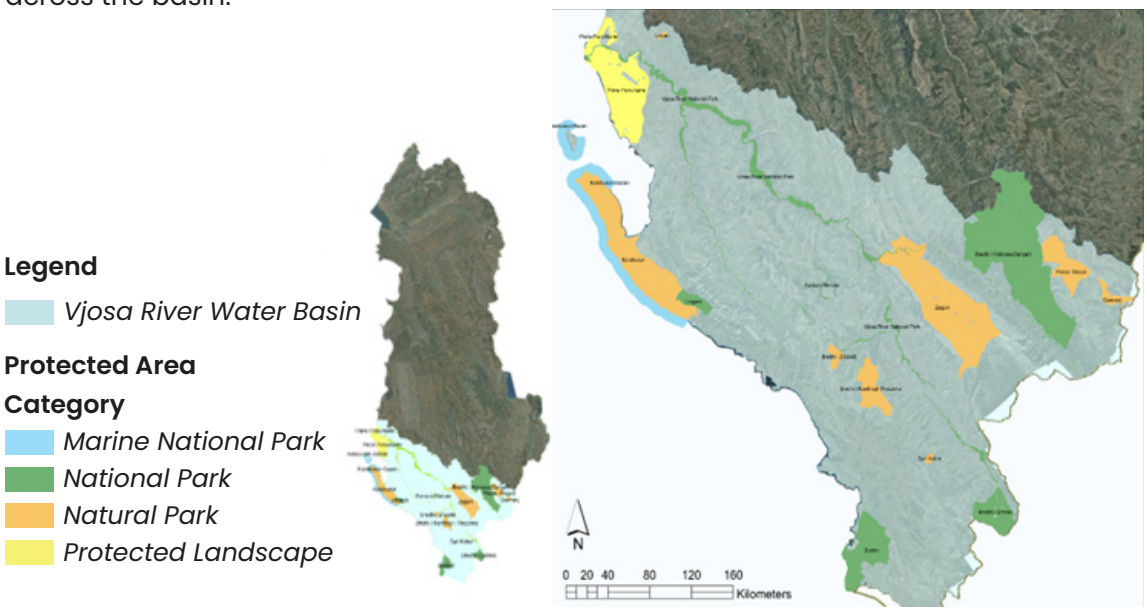

Figure 28: **Map of PA in the Vjosa River Basin**

Source: Processed with the PA latest data, May 2023

Table 12: **Protected areas located in the Vjosa River Basin**

Protected Area	Size (ha)	PA category (equvivalent to the IUCN categorisation)
Bredhi i Hotovës - Dangëllia National Park	36.004	II
Gërmenj Nature Park	1.410	IV
Bredhi i Kardhiqit-Rrëzomë Nature Park	4.303	IV
Pishë Poro-Nartë Protected Landscape	16.125	V
Karaburun-Sazan Marine National Park	12.438	II
National Park Llogora	1.769	II
Butrint National Park	8.622	II
Bredhi i Zhulatit Nature Park	936	IV
Syri i Kaltër Nature Park	293	IV
Bredhi i Sotirës Nature Park	4.928	IV
Zagori Nature Park	24.608	IV
Porto Palermo Nature Park	1.695	IV
Vjosa Wild River National Park	12.727	II

5.3.1 Vjosa Wild River National Park (VWRNP) in a nutshell

VWRNP was established by DCM no. 153 (13th of March 2023) as an IUCN Category II (National Park). The VWRNP main objective is to protect the natural dynamics of river Vjosa from the Greek border, passing through the regions Korçë, Gjirokastër, Vlorë and Fier and ending at the delta area at the Adriatic Sea. The national park comprises the main river Vjosa and three free-flowing tributaries (Drino with Kardhiq, Bënça and Shushica).

VWRNP comprises one of the most magnificent functioning natural riparian ecosystems in the Balkans, which is exceptional for their natural hydro-morphodynamic fluvial processes and characterized by its unobstructed fluvial morphology, continuity of water flow and sediment transport processes and related immense biodiversity.

Only the river (=water) and first level flooding territory is included in the national park (not the entire catchment of Vjosa). VWRNP covers a total area of 12,727 ha, consisting mainly of water surfaces (47.3 %), coastal areas and floodplains (36.1 %), land areas (9.5 %) and river terraces (7.1 %). It protects around 400 km of free-flowing river Vjosa and three tributaries and the immediate surrounding (such as floodplains, riparian habitats).

5.4 Policies and Legal Framework on Protected Areas

5.4.1 Overview of National Legislation

Albania's journey in nature conservation dates back approximately five decades, with ongoing initiatives to enhance and update legislation and protective measures since the 1990s. Furthermore, as part of its integration process into the European Union, Albania is compelled to uphold and oversee its natural ecosystems following the regulations and directives of the European Union.
Law No. 81/2017 "On Protected Areas" is the framework law, showing the broad convergence of the national biodiversity conservation legislation with that of the EU.

5.4.1.1 *Protected area categories in Albania*

Law No. 81/2017 "On Protected Areas" defines eight protected area categories in Albania, referring to the IUCN protected area category system (categories I- VI, indicated in brackets, as underlined below):

1. Strict nature reserve/science reserve (category I);
2. National park (category II);
3. Natural monument (category III);
4. Managed nature reserve/nature park (category IV);
5. Protected landscape area (category V);
6. Managed resource conservation area/multipurpose conservation area (category VI);
7. Municipal nature park (category IV);
8. Green crowns (around cities) (category V).

Each protected area category in the national law in Albania is further determined by the objective or purpose of protection, followed by the list of prohibited and non-prohibited activities. For some protected area categories, management objectives are also mentioned, but the description is not strictly divided as in the IUCN categories based on primary and other management objectives, which leaves some room for interpretation.

Table below provides the description and objectives of selected protected area categories in the Law No. 81/2017 "On Protected Areas".

Table 13: **Description and objectives of selected protected area categories under Albanian law**

Category II – National Park

Description and aims

1. A national park may be declared for *extensive* territories, usually not less than 1,000 hectares, *unique for their national and international values*, which are protected and managed for the protection of *ecosystems, species, education and recreation* (leisure, entertainment), and which regulates the sustainable use of resources by humans.
2. The level of protection is applied to the national park with the aim of preserving the territory in *its natural state, conserving the biotic communities, species and genetic resources* in order to ensure ecological stability and diversity, and where:
   - *human intensive occupation or exploitation is excluded*;
   - use of land with *intensive technologies*, means and manners *that cause fundamental changes to its biodiversity, structure and functions of ecosystems*, or that damage irreversibly the land surface is *prohibited*;
   - *construction* of urban areas, highways, railways, high voltage power lines and long-range oil and gas systems *is prohibited*;
   - *alternation of the natural state of water* reservations*, sources,* lakes *and wetland systems is prohibited*;
   - any other activity contradicting the objectives for the preservation of the area is prohibited.
3. Activities that provide for *spiritual, scientific, educational, and recreational opportunities* may be carried out in accordance with environmental and cultural requirements, but only after the approval of state institutions is obtained and if their aim is:
   - to conserve the area in its natural state or as near to its natural state as possible;
   - to treasure the ecological and geomorphological values, sacred or aesthetic objects, for which the area is taken under protection;
   - to take into consideration the needs of local residents, including fishing*, grazing* and firewood, *to the extent that they do not harm other objectives of management*.
4. Upon the written and justified proposal of the protected area authority, the National Agency of Protected Areas (NAPA) may approve:
   - *grazing and passing through of livestock* and construction of light or temporary structures to house them;
   - putting up stands, signboards, advertisements, signs and posters;
   - *sailing in boats*, canoes and other means of sailing (not motorised);
   - non-military flights in helicopters, balloons, delta planes etc.;
   - driving and parking vehicles out of the assigned roads and spaces;
   - mountain climbing, skiing, camping and lighting of fires outside the defined spaces;
   - collecting of plants, fruits, seeds and fungi;
   - performing of *seasonal tourism activities, that do not require the permanent occupation of the land*.
5. Where the park protection authority notes that the purpose for which the park was declared a national park is violated, it may temporarily restrict or prohibit the movement of vehicles, fishing and other allowed activities.
6. Upon proposal of NAPA, the Minister may adopt an instruction on procedures for temporary prohibition of allowed activities where the purpose for which the area was declared protected is violated.
7. The management plan of the national park, should clearly define, according to management zones, the detailed activities that are allowed, prohibited or that require permission from responsible authorities according to existing legislation.

Category III – Natural Monument

Description and aims

1. A natural monument may be declared for a natural formation with a surface **up to 50 hectares** (including special biological elements), a special geological and geomorphological formation, a deposit of minerals or a habitat of a rare, endangered or of particular scientific and aesthetic importance species.
2. In a natural monument, the same degree of protection shall apply as to **Strict Reserves***. The area shall be protected and managed for conservation of specific features and natural phenomena, cultural, historical and archaeological, for which it is declared a monument.
3. Natural monuments are surrounded by a buffer zone of 50 meters in width from the perimeter of the monument.
4. In accordance with the degree of protection of the monument, upon proposal of NAPA, the Minister may approve short-term special rules for visits or passing through of visitors or tourists.
5. Every 5 years, NAPA should reassess the list of nature monuments, which is approved by decision of the council of ministers under minister proposal.

*** Strict nature reserve (Category I)**

1. A strict nature reserve is declared for relatively small areas or territories, which possess some unique ecosystems, typical or representative, and/or species of flora and/or fauna of scientific importance suitable for scientific research and/or monitoring, and which have little or no human intervention at all. This category shall consist of two main subcategories; *Sub-category Ib* is potentially relevant for the Vjosa River Valley, particularly in its upper section: "Protected Area mainly managed for protection of the wildlife or Strict Nature Reserve, which is protected and managed so as to preserve their natural condition".
2. The highest level of protection shall apply to the strict natural reserves, where all human activity is prohibited and the main objectives are:
   - preservation of the biodiversity of the area shall be achieved through protection, that does not require any active management or habitat manipulation;
   - to minimize disturbances and concerns through careful planning of implementation of scientific research and other approved activities;
   - to limit contacts of the public with the area and to prevent its use for rest and leisure; and
   - to allow the presence of visitors without motorised vehicles up to a level which serves best their physical and spiritual welfare, and which ensures the quality of wildlife of the area for the present and future generations.

Category IV – Managed Nature Reserve or Nature Park

Description and aims

1. A managed nature reserve or nature park shall be declared for those territories that are *not very large* and represent areas of *active human intervention for management purposes of species and habitats*, in order to ensure the preservation of habitats and meet the specific requirements of *species of regional and local importance*, as well as areas used for research, educational and cultural purposes.
2. A nature park is declared for the following main objectives:
   - ensuring the protection of habitat conditions necessary to protect significant species, groups of species, biotic communities or physical features of the environment, *that require special intervention for optimum management*;
   - facilitating scientific research and environmental monitoring as primary activities associated with the sustainable management of natural resources;
   - enabling the local population encompassed within the area to obtain economic benefits, as one of the objectives of management.
   - establishing special areas for the environmental education of public, assessment of habitat features and efforts to manage the species in nature;
3. Within the nature park the following activities are prohibited:
   - the alter*nation of* the natural state of water reservoirs, springs, lakes and *wetland systems*;
   - the exploitation and occupation of the area with activities that are incompatible with the purposes for which it is put under protection;
4. Upon the prior written approval of the protected area authority, the following activities may be carried out:
   - driving and parking vehicles out of the assigned public roads and parking spaces;
   - collection of plants, minerals, palaeontological discoveries and stones;
   - establishment and operation of facilities for military and protection purposes.
   - placement of stands, signboards, advertisements, signs and posters, without prejudice to those that provide data on the objectives of the protected reserve;
   - skiing, camping and lighting of fires outside the designated areas.
5. In order to comply with the protective measures set forth in the management plan, the rules for short-term visits or passing through of visitors or tourists shall be approved by Instruction of the minister, upon proposal of NAPA.
6. the management plan of the nature park, should clearly define, according to management zones, the detailed activities that are allowed, prohibited or that require permission from responsible authorities according to existing legislation.

Category V – Protected Landscape

Description and aims

1. A protected landscape shall be declared for territories greater than 1000 hectares, with a well formed and harmonious landscape, with uniquely developed features and a variety of ecosystems, marine or terrestrial, and the areas within which **residential centres** carrying out activities, such as **agriculture, fruticulture, forestry, fishing** may be located.
2. The protected landscape is managed in order to preserve the landscape, biodiversity, entertainment and leisure values of the area. This category includes land/sea/water in public or private ownership.
3. In a protected landscape the degree of protection, which ensures the following main objectives, shall apply:
   - to strengthen the **balanced interaction of nature and culture for the protection of the landscape, the traditional land uses and building practices**, and the typical social and cultural manifestations of the area;
   - to provide opportunities for well-being and **economic activities that are in harmony with nature** and the preservation of cultural and spiritual values of local population;
   - to eliminate where necessary, and to prevent the use of land and performance of other activities which are deemed inappropriate in scale and/or in content;
   - to create opportunities for the public to enjoy recreation and tourism, in accordance with the character and scope of the essential features of the area;
   - to encourage scientific and educational activities, that may assist in the long-term development and welfare of local populations and ensure the wide public support for the preservation of the environment in those protected areas;
   - to bring economic benefits and contribute to the improvement of the welfare of local populations through exploitation of natural products/such as forests and fish production and services/clean water or income derived from appropriate forms of tourism.
4. Activities that alter the use of the territory, i.e., **construction**, sewage treatment in farms, interventions to areas greater than 2 hectares, construction of highways, sailing canals and urban areas, and other similar activities **may be allowed** only if the entity seeking to perform such activities **is issued the environmental permit**.
5. The written approval of the protected area authority shall constitute sufficient authorisation for excising the activities stated below:
   - use of chemicals and pesticides in agricultural lands;
   - lighting fires out of designated places and areas;
   - driving vehicles out of roads and assigned places; this rule does not apply to state agricultural and forestry vehicles and machineries, to fire engines, ambulances, to veterinary services and water management machinery;
   - organization of cars, motorbikes and bicycles racing;
   - practice of unique or traditional use of land and social organisations emanating from human settlements, local customs and religious beliefs, should be allowed upon requisition of an environmental permit.
6. The management plan of the protected landscape, should clearly define, according to management zones, the detailed activities that are allowed, prohibited or that require permission from responsible authorities according to existing legislation.

5.4.1.2 *Organizational framework for Protected Areas in Albania*

Albania's legislative and strategic framework for protection of the environment and natural resources includes the **Law on Protected Areas (No. 81/2017)** and its recent amendments through **Law No. 21, dated 22.2.2024.** Three key legal legislative backgrounds are the **Law on Environmental Protection (No. 10431),** the **Law on Biodiversity Protection (No. 9587),** and the **Law on Integrated Water Management (No. 111/2012).**

Sectorial strategies like the **General National Spatial Plan (GNSP) 2030,** the **National Strategy for Development and Integration (NSDI) 2022–2030,** and the **Agriculture, Rural Development, and Fisheries Strategy 2021–2027** further embed these objectives in spatial planning, rural development, and tourism, ensuring alignment with EU directives such as establishment and management of the Natura 2000 network

5.4.1.2.1 *The Law No. 81/2017 on Protected Areas*

The implementation of the Law No. 81/2017 on Protected Areas provides for the relevant administrative structures, with the NAPA as the central public body within the Ministry of Tourism and Environment that leads and manages the protection and management activities of all natural PAs, and the Regional Administrations of Protected Areas as the competent local bodies at the district level (in particular, RAPA Vlorë, Fier and Gjirokastër are responsible for the Vjosa Basin) that cover the management and monitoring aspects.

The municipalities that implement the Law on Protected Areas within their territory cooperate with the RAPAs. The law also provides for the establishment of management committees as oversight organizations to ensure the effective implementation of management plans. These committees are composed of representatives from municipalities, the NAPAs, and other local stakeholders from sectors such as agriculture, tourism, forestry, business, and civil society. However, currently, no overarching strategy for Protected Areas (PAs) exists to facilitate cooperation among these diverse actors.
In general, RAPAs face significant operational challenges due to limited resources. Human resources are often insufficient to cover the extensive areas within their jurisdiction, and financial resources are inadequate for carrying out all necessary management and monitoring tasks effectively. Additionally, PA staff frequently lack adequate skills to professionally fulfil their roles.

Although Law No. 81/2017 mandates that PA management should follow the Specific Plan for PAs and the Plan for the Management of the Country's Ecological Network, there is still no comprehensive study on this requirement. Moreover, most PAs in the Vjosa Basin lack an updated management plan approved by the Ministry of Tourism and Environment.

5.4.1.2.2 *Additions and Changes of the Law No. 81/2017 'On Protected Areas'*

Law No. 21, dated 22.2.2024, "On Some Additions and Changes To Law No. 81/2017 'On Protected Areas,'" is the latest legislative amendment that introduces additional provisions for the management of protected areas in Albania, directly also influencing the management framework of the Vjosa Wild River National Park (VWRNP). Key changes include updated guidelines for conservation standards, stricter enforcement mechanisms, and enhanced roles for local stakeholders in decision-making processes. This amendment aims to strengthen the legal foundation for effective management, monitoring, and sustainable use of protected areas, thus aligning more closely with EU conservation policies.

The proposed law aims to address issues identified from the implementation of the existing law by proposing the following changes in relation to protected areas:

1. To redefine the principles of managing protected areas by adding the principle of "suitability," "the principle of categorizing objectives," and "the principle of management flexibility," with the goal of enhancing the efficiency of these areas' management processes, based on the principles of the IUCN.

2. To reformulate state policies in the field of protected areas, considering the need for collaboration/interaction with other central and local government institutions, as well as civil society, to effectively administer, conserve, and protect these areas.

3. To review the functions of public institutions in order to strengthen their roles through coordination and harmonization of joint work, aiming to ensure the conservation, protection, and administration of protected areas.

4. To guarantee public access to protected areas.

5. To redefine the types of environmental protected areas according to the type of interest for which protection status has been granted, including the addition of a category for "protected areas of local/municipal interest," to facilitate their management by local government institutions.

6. To enable municipalities to manage a portion of the protected areas that are part of their respective territories they administer.

7. To reformulate the objectives for declaring territories as protected areas, with the purpose of protecting these areas through increasing public awareness, education, encouragement of scientific research activities, recreational activities, and economic activities in accordance with the principle of efficiency, but also with the objectives of the protected area.

8. To harmonize the terminology of the law with that of the IUCN.

9. To reformulate the allowed or prohibited activities in the protected area "National Park."

10 To enable residents of the area to develop economic activities that adhere to the principles of sustainable development, ensuring access and benefits while focusing on the economic growth of the region. To allow permitted urban, recreational, or industrial interventions within the area, but preserving its character.

11 To encourage and support initiatives, projects, programs, and activities aimed at improving the ecological and natural indicators of an environmentally protected area, or that have a positive impact on them.

Law No. 21, dated 22.2.2024, "On Some Additions and Changes to Law No. 81/2017 'On Protected Areas, is a step back in the process of protected area management in Albania. Several civil society actors such, PPNEA, EcoAlbania and INCA have shown their disagreement with this new amendment of the law. Among other aspect, the Article 7, which suggests amending Article 9 of the law, broadens the scope for interventions within protected areas to include urban areas, recreational activities, and various infrastructures such as roads, railways, and energy systems, including renewable energy, oil and gas facilities. Initially, PAs were not designed to accommodate such wide-ranging activities. Implementing these changes could expose these areas to development projects that could undermine their original conservation goals.

Also, the proposal to repeal Article 13, which sets out the zoning regulations for protected areas, contradicts proven management strategies that have historically preserved these regions. Zoning is crucial for balancing the preservation of natural values with the socio-economic activities of local communities. Eliminating these regulations could disrupt the delicate management balance required for both conservation and community benefits.

Furthermore, Article 6 proposes modifications to Article 8, allowing municipalities to manage at least 20% of protected area territorieswhich includes the potential for intensive infrastructure development such as hotels and other facilities. This could lead to administrative conflicts, as municipalities are tasked with specific duties and responsibilities under their organic laws, which include compliance with protected area legislation. This division of management could hinder coordinated efforts necessary for the successful implementation of VRWNP's integrated management plan, potentially fragmenting the conservation efforts and reducing the effectiveness of environmental protection measures across these areas. Finally, in the Law No. 21, dated 22.2.2024, "On Some Additions and Changes to Law No. 81/2017 'On Protected Areas, In Article 1, after point 25, the addition expressed in the point 25/1, is addressing 'excellence tourism'.

In the context of this law, excellence tourism refers to a type of tourism that provides accommodation in structures meeting the highest architectural and environmental standards, as well as exclusive high-level tourism services. And in point 36, after the word "traditional," the words "economic and tourist, aligning the objective of protection, effectiveness, and appropriateness with the characteristics of the protected area or sub-zone" are added. These changes create the possibility for the construction of five-star hotels in protected areas, including the core zones of the national parks, for example.

5.4.1 'International and EU legislative frameworks concerning protected and conserved areas

International and EU legislation concerning protected areas emphasize the importance of diverse protection mechanisms to safeguard biodiversity and natural resources.

5.4.2.1 *The Convention on Biological Diversity (CBD)*

CBD is a pivotal international agreement that has played a significant role in shaping global policies for the conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of benefits arising from genetic resources. One of the fundamental aspects of the CBD that relates to protected areas (PAs) is its focus on conserving biological diversity through the establishment and effective management of these protected areas.

The 30x30 Global Biodiversity Framework

With the conclusion of the Aichi Biodiversity Targets in 2020, a new global framework for biodiversity conservation has emerged — the 30x30 agreement, adopted as part of the Kunming-Montreal Global Biodiversity Framework during the COP15 to the Convention on Biological Diversity (CBD). This ambitious initiative aims to protect and conserve 30% of the planet's terrestrial and marine ecosystems by 2030, addressing the urgent need for transformative action to halt biodiversity loss. The 30x30 agreement expands the scope of conservation efforts beyond traditional protected areas by including Other Effective Area-Based Conservation Measures (OECMs). OECMs are areas that, while not formally designated as protected areas, deliver significant long-term biodiversity conservation benefits. These include indigenous territories, community-managed lands, and privately owned conservation areas. Recognizing OECMs, the framework acknowledges the diverse governance systems and management approaches contributing to biodiversity conservation.

The 30 x 30 agreement underscores the need for inclusivity and equity, particularly by integrating contributions from indigenous peoples, local communities, and private stakeholders. It also highlights the importance of addressing drivers of biodiversity loss, such as habitat destruction, overexploitation, and climate change, through a collaborative global effort.

5.4.2.2 *Ramsar Convention*

The Ramsar Convention, officially known as the Convention on Wetlands of International Importance especially as Waterfowl Habitat, is an international treaty established in 1971 in Ramsar, Iran. It represents one of the earliest global conservation agreements and specifically addresses the conservation and wise use of wetlands and their resources. The Ramsar Convention plays a pivotal role in conserving globally significant wetlands, and its principles are particularly relevant to Albania's natural heritage.

One of the core elements of the Ramsar Convention is the designation of Wetlands of International Importance, commonly known as Ramsar Sites. These are wetlands deemed significant for global biological diversity and for sustaining human life through the multitude of ecological services they provide, such as freshwater supply, food resources, biodiversity, flood control, groundwater replenishment, and climate change mitigation.

The Vjosa River and the nearby Narta Lagoon, are examples of ecosystems that align with the convention's objectives. These areas provide critical habitats for numerous species, offer ecological services, and hold potential for Ramsar designation, underscoring their importance in safeguarding biodiversity and supporting sustainable development.

5.4.2.3 *UNESCO World Heritage Sites*

The World Heritage Committee evaluates nominations of the sites for designation based on Outstanding Universal Value (OUV) and the site's adherence to at least one of ten selection criteria. The sites covered are listed as Natural, Cultural or Mixed Sites. The property must already have legal protection at the national or subnational level before being nominated. However not all World Heritage properties (those that were designated many years or decades ago) are legally designated as protected areas under national law. It is required to have a management authority and a management plan or system in place to ensure the property's values are preserved. The plan should address conservation, monitoring, and sustainable use.

5.4.2.4 *UNESCO Man and Biosphere Reserves*

Biosphere Reserves are designed to integrate conservation and sustainable development through a zoned approach. Biosphere Reserves are designated by UNESCO based on a nomination by national governments; the site meets criteria related to ecological, cultural, and socio-economic importance. A site must demonstrate its ability to balance conservation, sustainable use, and logistic support (research, education, and monitoring). Biosphere Reserves are structured into three interrelated zones:

1. the Core Zone is dedicated to strict protection of ecosystems, species, and biodiversity. Where only minimal human intervention is allowed.

2. the Buffer Zone surrounds the core area and supports compatible activities such as research, education, and sustainable resource management.

3 the Transition Zone is focusing on sustainable development and human activity and encourages cooperation among local communities, businesses, and stakeholders for economic and social well-being.

Biosphere Reserves are not automatically considered protected areas under the IUCN framework but the core zone (must already be legally protected at the national level) often aligns with IUCN protected area categories (e.g., Categories Ia, II, or IV), but the reserve as a whole, includes areas of active human use (buffer and transition zones). Buffer and transition zones may or may not have formal protection, depending on the national framework. It is mandatory for the Biosphere Reserve to have a management authority or coordinating body and a management plan to oversee activities across all zones.

5.4.3 EU legislation

The European Union (EU) legislative framework plays a critical role in environmental conservation, mainly through its Directives, which are legally binding legislative acts. An EU Directive sets goals that all Member States must achieve but allows each country to determine how to implement them within its national legal systems. The Habitats Directive and the Birds Directive form the cornerstone of EU nature conservation policy, obligating Member States to designate and manage Natura 2000 sites to protect critical species and habitats. Also, EU candidate states, such as Albania, must align their national legislation with EU Directives during the approximation process. Candidate countries must adopt and implement EU environmental standards before full membership, ensuring their policies, practices, and governance structures comply with EU requirements. This obligation reflects the broader integration process and demonstrates a commitment to upholding shared environmental and conservation objectives across Europe.

The European Union's water and nature conservation legislation, including the Nature Restoration Law, the Water Framework Directive, and the EU's Nature Directives, provides effective mechanisms to protect and restore free-flowing rivers. These legal instruments include obligations to prevent deterioration and ensure restoration of designated sites within the Natura 2000 network, particularly riverine ecosystems. However, despite this robust legal framework, implementation across EU Member States has often been insufficient, failing to prevent further degradation of free-flowing rivers and their natural properties (Schäfer, 2021a; Valentim et al., 2024).

5.4.3.1 *Birds Directive*

The Birds Directive Article 11 of the Directive 79/409/EEC (2009/147/EC) on the conservation of wild birds ("The Birds Directive") relates to the prevention of damage to local flora and fauna by the introduction of bird species which do not occur naturally in the wild state in the European territory of the Member States. The Birds Directive, formally known as the Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds, is a crucial piece of environmental legislation in the European Union.

It was originally adopted in 1979 and has been amended subsequently to better address the conservation needs of wild bird species across Europe. The directive plays a significant role in defining the conservation measures for birds, particularly through the designation and management of Special Protection Areas (SPAs). Applying the principles of the Birds Directive to the Vjosa River can significantly contribute to the protection and conservation of bird species and their habitats. It provides a comprehensive framework that can help ensure the ecological integrity of this unique river ecosystem is maintained. As Albania works towards EU integration, leveraging EU directives like the Birds Directive will be crucial in safeguarding its natural heritage, promoting biodiversity, and fulfilling international conservation commitments.

5.4.3.2 *Habitats Directive*

The Habitats Directive established the "Natura 2000 Network", the largest ecological network of special protected areas. It comprises special areas of conservation designated also includes special protection areas classified pursuant to the Birds Directive. The Article 22.b of the Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ("The Habitats Directive") requires the Member States to "ensure that the deliberate introduction into the wild of any species which is not native to their territory is regulated so as not to prejudice natural habitats within their natural range or the wild native fauna and flora and, if they consider it necessary, prohibit such introduction". Under the Habitats Directive, countries within the EU are required to designate Special Areas of Conservation (SACs) for the protection of habitats and species listed in the directive's annexes. Although Albania is not a member of the EU, the principles of the directive can guide conservation efforts for the Vjosa River, advocating for the establishment of SACs along its length. This would ensure the preservation of its unique habitats, which support a variety of flora and fauna, some of which are rare or endangered.

5.4.3.3 *Natura 2000 network*

Natura 2000 is a network of protected areas across the European Union established under the EU's Birds Directive and Habitats Directive. Its primary goal is to ensure the long-term survival of Europe's most valuable and threatened species and habitats. Natura 2000 is an essential tool for biodiversity conservation in the EU, providing a framework for managing both terrestrial and marine protected areas.
The Natura 2000 network is made up of Special Protection Areas (SPAs), designated under the Birds Directive, and Special Areas of Conservation SACs, designated under the Habitats Directive. For the Vjosa River, which flows through rich and varied habitats, these designations could be instrumental in conserving critical habitats for birds, fish, and other species. Similarly, Natura 2000 sites are not necessarily strictly no-use zones. Instead, they are managed in a way that integrates environmental conservation with human activities. This approach would be crucial for the Vjosa River, considering the socio-economic aspects of the region, including agriculture, fishing and potential eco-tourism. Implementing Natura 2000 directives could help balance conservation needs with local economic interests, ensuring sustainable use of the river's resources. However, as the Vjosa River flows from Greece to Albania, transboundary management is essential. However, cooperation between EU member states and neighbouring countries like Albania could be fostered to extend Natura 2000-like protections to the river.

5.4.3.4 *The Water Framework Directive (WFD)*

The Water Framework Directive (WFD) 2000/60/EC is the cornerstone of EU policy for managing inland, transitional, and coastal waters. A key component of the WFD is the establishment of a Register of Protected Areas, which identifies water bodies that require special protection. These protected areas are designated under national or European legislation to safeguard their surface or groundwater quality or to conserve habitats and species that depend directly on these waters. This integrated approach ensures that water management strategies align with broader conservation objectives, promoting ecosystem health and sustainable water use. The WFD states that water quality management be focused on river basins. Management of these basins will be achieved through management plans including the assessment of pressures and impacts caused by humans.

However, the WFD does not explicitly require Member States to take account of alien species for the assessment of ecological status of their surface water bodies. Because of this, a debate has arisen on the role of invasive species in the classification of area under the WFD. Similarly, WFD provisions do not fully rule out hydropower development and barrier construction but allow exemptions under Art. 4.7 WFD, even in rivers of high ecological value. A precedent in this regard was set by the ruling of the European Court of Justice on the case of the Schwarze Sulm River in Austria in 2016. The environmental effects of barriers in watercourses are one of the main reasons why the environmental objectives of the Water Framework Directive (WFD) were largely not met by 2018, with only 40% of the EU's surface water bodies reaching "good ecological status" or "good ecological potential". In conclusion, implementation of these legal provisions in the EU member states has been insufficient and, in many cases, not able to prevent further degradation of free-flowing rivers, their natural properties and biodiversity (Schäfer, 2021a).

The Water Framework Directive (WFD) requires member states to develop River Basin Management Plans (RBMPs) every six years, focusing on achieving good ecological and chemical status for water bodies. Despite its ambitious goals, many member states need more funding and need to overcome several institutional barriers.

5.4.3.5 *The EU Biodiversity Strategy 2030 and the Nature Restoration Law*

The main aim of the EU Biodiversity Strategy for 2030 is to halt biodiversity loss and restore ecosystems, placing Europe's biodiversity on a path to recovery by 2030. This strategy contributes to the EU's commitment to global biodiversity goals under the UN's Convention on Biological Diversity and aligns with the European Green Deal.

The European Union has adopted the Nature Restoration Law, a groundbreaking initiative to restore degraded ecosystems for the benefit of people, the climate, and the planet. This law establishes binding targets to reverse biodiversity loss and restore critical habitats, including riverine habitats, on a large scale. One of its specific objectives is River Connectivity, which targets identifying and removing barriers to restore at least 25,000 km of rivers to a free-flowing state by 2030.

5.4.4 Other European legislation

In addition to the Natura 2000 network, which is a network of ecological (conserved) areas within the European Union, the Emerald Network, based on teh provisions of the Bern Convention, is used in non-EU countries. The two networks are basically similar and are also formed on the basis of very similar lists of threatened species and habitats, for which countries are obliged to establish Natura 2000/Emerald sites and to set conservation targets.

5.4.4.1 *Bern Convention*

The Bern Convention, formally known as the Convention on the Conservation of European Wildlife and Natural Habitats, was adopted in 1979 and is one of Europe's earliest and most significant international legal instruments to conserve wildlife and natural habitats. Its main objective is to ensure the conservation and protection of wild plant and animal species and their natural habitats, especially endangered and vulnerable ones, and to promote cooperation between states. The Bern Convention requires the contracting parties to take appropriate and necessary legislative and administrative measures to ensure the conservation of habitats and the natural environment. This includes preserving the ecological quality of water bodies that support the life cycles of aquatic and semi-aquatic species; for a wild river such as the Vjosa, which is noted for its pristine ecological state and free-flowing nature, the convention advocates for the maintenance of such habitats to prevent any deterioration that might arise from development activities.
Emerald sites are areas of special conservation interest established under the Bern Convention on the Conservation of European Wildlife and Natural Habitats. The Emerald Network aims to ensure the long-term survival of Europe's most valuable and threatened species and habitats.

5.4.5 Overview of global conservation initiatives for protection of the river ecosystems

Wild rivers, which are free-flowing and relatively undisturbed by human activities, are recognized by the IUCN for their high conservation value, however there is no single IUCN protected area category that would refer only at riverine ecosystems. They support diverse ecosystems that are often more resilient to environmental changes and stressors than more heavily managed river systems. The IUCN advocates for the protection of wild rivers through various initiatives, such as the Freshwater Protected Areas Network. These initiatives focus on enhancing the conservation status of freshwater ecosystems and promoting policies that prioritize the ecological health of rivers. Conserving wild rivers presents unique challenges, including threats from dam construction, pollution, unsustainable water extraction, and climate change. The IUCN works with governments, local communities, and other stakeholders to mitigate these threats by promoting integrated water resource management and sustainable practices.

5.4.5.1 *Overview of the global mechanisms to maintain the river's connectivity*

The mechanisms to maintain river's connectivity include river-specific designations, like the National Wild and Scenic Rivers System in the United States, Canadian Heritage Rivers System and River Protection Reserves in Spain. Additionally, policies such as Mexico's Environmental Water Reserves and Water Resource Protection Areas in Zambia play a vital role in maintaining free-flowing rivers.

However, river-specific protection mechanisms differ in their primary management objectives. According to the IUCN definition, protected areas must prioritize biodiversity conservation as their primary goal. Mechanisms like the National Wild and Scenic Rivers System in the United States and the Canadian Heritage Rivers System align with this definition because they are primarily managed to conserve rivers' natural and ecological integrity. In contrast, mechanisms such as Mexico's Environmental Water Reserves and Zambia's Water Resource Protection Areas aim to ensure water availability and quality for human use, such as drinking water, agriculture, or hydroelectric power. While these areas may provide secondary benefits to biodiversity conservation, their primary purpose does not align with the IUCN's definition of the protected area.

Research and case studies indicate that while terrestrial PAs offer some incidental protection to riverine systems within their boundaries, they are not designed to handle specific riverine threats or to maintain the ecological processes unique to river ecosystems (Abell et al., 2007; Valentim et al., 2024). Factors limiting the effectiveness of terrestrial PAs in protecting rivers include:

1. Lack of a whole catchment approach.
2. Limited connectivity within PA networks.
3. Inadequate control of threats beyond PA boundaries.
4. Low relevance of terrestrial taxa as surrogates for fluvial biodiversity.

Thus, there continues to be an urgent need to separate policies and methodologies to address PA design, designation, and management specific to the conservation of riverine species and ecosystems, which are too often assembled in with terrestrial habitats or marine environments (Abell et al., 2007; Saunders et al., 2002; van Rees et al., 2021).

In addition, different countries have enacted specific laws to protect river ecosystems. Finland's Rapids Protection Act, for example, prohibits hydropower projects in designated river stretches and compensates water rights owners for economic losses incurred due to these restrictions. In Sweden similar protections exist under the Environmental Code, prohibiting hydropower development in sensitive areas. In Norway the Water Resources Act integrates strategic planning for balancing hydropower development with conservation efforts through a National Protection Plan for Water Courses (Schäfer, 2021b).

The Rights of Rivers movement emphasises recognising rivers as living entities with inherent rights similar to those of individuals or corporations. This approach is encapsulated in the Universal Declaration of River Rights (UDRR), which outlines six fundamental rights for rivers, including the right to flow, to be free from pollution, and to support biodiversity. Countries such as New Zealand and Colombia have successfully implemented this framework, granting legal personhood to specific rivers, thereby enabling local communities to enforce these rights in court. Countries like the USA, Canada, Australia, South Africa, Spain, France, New Zealand, Thailand, and Norway have successfully established fluvial PAs. These areas often report significant ecological gains, including enhanced biodiversity, improved water quality, and restored natural river functions. The table below presents some of the key issues related to their protection system and the challenges that they face in the management process.

Table 14: **Case studies on riverine protected areas**

Wild and Scenic Rivers (WSR-USA)

Conservation-management **Advantages**

1. **Conservation Success**: Protects over 21,000 km of rivers across 40 states and Puerto Rico, ensuring the preservation of free-flowing nature and water quality
2. **Diverse Values Protected**: Rivers are designated for their wild, scenic, and recreational values, which include recreation, fish, wildlife, cultural, geologic, historic values, and more
3. **Comprehensive Management**: Each designated river is supported by a Comprehensive River Management Plan to secure its protection and enhance its natural processes **Habitat Preservation**: The designation maintains essential physical habitats for native species, facilitating natural ecological functions
4. **Climate Resilience**: Contributes to increased resilience against climate change impacts **Community Engagement**: Promotes community-driven conservation projects such as dam removal and restoration of riparian buffers, enhancing river health and ecological integrity.

Conservation-management **Challenges**

1. **Constraints of WSR Designation and Areas for Improvement**
2. **Inconclusive Impact Evidence**: show that direct, measurable effects of river designation on instream biota and ecosystem health are not always clear.
3. **Research Gaps**: The effects of the WSR designation need further investigation, as significant benefits are often reported anecdotally or in scattered reports by different conservation agencies.
4. **Management Challenges**: While the system aims to protect riverine values, the complexity of managing designated rivers can vary greatly depending on local challenges and stakeholder dynamics.
5. **Potential for Improvement**: Focus on enhancing monitoring and research to better understand and quantify the ecological impacts of designation to support more effective management strategies.

Conservation-management **Advantages**

1. **Establishment**: Launched in 1984 as a cooperative, non-statutory agreement between federal, state, and territorial governments in Canada **Voluntary and Community-Driven**: Emphasizes a voluntary approach that encourages community involvement without mandating specific activities.

2. **Management Plans**: Each river under the CHRS has a tailored management plan aimed at preserving its unique and outstanding values.

3. **Monitoring and Evaluation**: Features a systematic decadal monitoring process to ensure the ongoing protection of river values, with potential de-designation if these values are not maintained.

4. **Geographic Spread**: Encompasses 41 designated rivers that extend over 11,000 km across Canada, reflecting a broad commitment to river conservation nationwide.

Conservation-management **Challenges**

1. **CHRS vs. WSR: Approaches to River Conservation**

2. **Designation Purpose**: Unlike the WSR's focus on protecting free-flowing nature and various recreational and natural values, the CHRS primarily aims to conserve rivers with significant natural values under a community-driven framework.

3. **Regulatory Framework**: The CHRS operates without statutory power, relying instead on voluntary participation and local management plans, contrasting with the WSR's more defined legislative backing through the Wild and Scenic River Act.

4. **Impact on River Management**: CHRS does not allow for impoundment within designated rivers, ensuring the natural flow and ecological integrity, a direct action not specified in the WSR system.

5. **Data and Research**: Similar to the WSR, evidence of the CHRS's benefits on aquatic communities and ecosystems remains limited, indicating a shared need for enhanced research and data collection in river conservation efforts.

Canadian Heritage River System (CHRS)

Conservation-management **Advantages**

1. **Comprehensive Protection**: Established between 1979 and 1991, Kakadu National Park protects the catchments of the South Alligator River, West Alligator River, Wildman River, and significant parts of the East Alligator River
2. **International Recognition**: Designated as a Wetland of International Importance under the Ramsar Convention and a World Heritage Site in 1981 for its outstanding cultural and natural values (BMT WBM 2010).
3. **Ecological Dynamics**: Encompasses an area of 19,816 km², featuring a dynamic fluvial system that extends from the headwaters to the river mouth, supporting diverse habitats and species (Parks Australia 2016).
4. **Regulatory Framework**: Implementation of a management plan restricts harmful activities, guiding decision-making and resource allocation to preserve the park's biodiversity (Parks Australia 2016).

Conservation-management **Challenges**

1. **CHRS vs. WSR:** Approaches to River Conservation
2. **Designation Purpose:** Unlike the WSR's focus on protecting free-flowing nature and various recreational and natural values, the CHRS primarily aims to conserve rivers with significant natural values under a community-driven framework.
3. **Regulatory Framework:** The CHRS operates without statutory power, relying instead on voluntary participation and local management plans, contrasting with the WSR's more defined legislative backing through the Wild and Scenic River Act.
4. **Impact on River Management:** CHRS does not allow for impoundment within designated rivers, ensuring the natural flow and ecological integrity, a direct action not specified in the WSR system.
5. **Data and Research:** Similar to the WSR, evidence of the CHRS's benefits on aquatic communities and ecosystems remains limited, indicating a shared need for enhanced research and data collection in river conservation efforts.

Community-based fish reserves (Thailand)

Advantages

1. **Local Empowerment**: Community-based management allows for more effective local stewardship compared to top-down approaches, leading to better conservation outcomes
2. **Increased Fish Populations**: Despite their small size (0.2 to 2.2 ha), these grassroots reserves have shown significant benefits for fish populations within the Salween River basin in northern Thailand (Koning et al., 2020).
3. **Strategic Location**: Reserves are strategically placed between the most upstream and downstream homes in villages, facilitating easier surveillance and protection by local communities (Koning et al. 2020).
4. **Effective Enforcement**: Localized penalties, both monetary and non-monetary, deter illegal fishing activities, enhancing reserve effectiveness (Koning et al. 2020).

Challenges

1. **Surrounded by High-Pressure Fishing Areas**: These reserves often exist amidst intensely fished regions, which can pose ongoing threats to the reserve's integrity and effectiveness
2. **Small Scale of Reserves**: The relatively small size of these reserves might limit their ecological impact and their ability to sustain larger fish populations over the long term.
3. **Dependence on Community Enforcement**: The success of these reserves heavily relies on local community engagement and compliance, which can vary significantly between locations and over time.
4. **Resource Limitations**: Ensuring adequate resources for monitoring and enforcement can be challenging, particularly in resource-limited settings.

Conservation-management **Advantages**

1. **Conservation and Management Goals**: These goals aim to identify Freshwater Ecosystem Priority Areas (FEPA) to maintain key ecological processes and conserve ecosystem types and species associated with rivers, wetlands, and estuaries (Driver et al. 2011).

2. **Implementation Framework**: Developed guidelines for effective protection measures across different management units, such as wetland FEPAs, river FEPAs, and associated catchment areas.

3. **Proactive and Reactive Uses**: The identified FEPA supports both proactive planning processes, such as catchment-wide planning, and reactive decision-making, such as water and land use regulations (Driver et al. 2011).

4. **Ecosystem Services Contribution**: Enhances a range of ecosystem services, including water purification, groundwater recharge, maintenance of freshwater fish populations, and disaster risk reduction (Balmford et al., 2015; Dudley et al., 2020; Feio et al., 2023; Valentim et al., 2024)

5. **Terrestrial and Aquatic Synergies**: Provides opportunities for integrating terrestrial and aquatic conservation, offering mutual benefits and supporting terrestrial species dependent on riverine ecosystems (van Rees et al. 2020; (Hermoso et al., 2015; van Rees et al., 2021)

Conservation-management **Challenges**

1. **Complexity in Designation**: The multi-faceted approach to identifying and managing FEPAs introduces complexities in coordination and implementation.

2. **Land Ownership and Use Conflicts**: The project faces challenges in areas where land is privately owned or where existing land use practices conflict with conservation goals.

3. **Dependency on Multiple Stakeholders**: Effective implementation requires cooperation across various stakeholders, which can be difficult to achieve, especially across different jurisdictions.

4. **Standardization and Monitoring Issues**: To evaluate the effectiveness of FEPAs comprehensively, consistent monitoring and standardized success metrics are needed.

5. **Financial and Resource Constraints**: Adequate funding and resources are critical for the sustained management and protection of FEPAs, which can be a significant hurdle in resource-limited settings.

Blanice River Nature Reserve

Conservation-management **Advantages**

1. **Designation Purpose**: Established in 1989 to protect the upper river network of the Blanice River from anthropogenic eutrophication and support habitat conditions for sensitive species like the freshwater pearl mussel (Margaritifera margaritifera) ((Fraindová et al., 2022)).

2. **Conservation Measures Implemented**:

- **Eradication of Mineral Fertilization**: Stopped the use of mineral fertilizers in the reserve area to reduce nutrient runoff.
- **Liming and Pesticide Application**: Ended the application of lime and pesticides to restore natural soil and water conditions.
- **Land Use Transition**: Converted croplands to traditional grasslands to promote a semi-natural landscape, enhancing biodiversity and ecological resilience (Staponites et al. 2022).
- **Landscape Outcome**: The reserve is now dominated by meadows and forests, representing a successful shift to a semi-natural environment.

Conservation-management **Challenges**

1. **Water Quality Assessment**: An assessment conducted by comparing data from before 1992 and after 2000 to evaluate the impact of the reserve's management practices on water quality.

2. **Improvements Observed**: Significant enhancements in surface water quality, indicative of successful conservation and management strategies ((Staponites et al., 2022)).

3. **Support for Biodiversity**: The improved water quality supports the survival and thriving of sensitive riverine species, particularly highlighting the conservation of the freshwater pearl mussel.

4. **Ongoing Monitoring and Management**: Highlights the need for continued monitoring to ensure the ongoing effectiveness of these conservation measures and adapt as necessary.

Source: Author elaboration from Valentim et al 2024

5.5 Gap analysis

5.5.1 Protected area system in Albania

Based on the data collected and the analyses carried out, the key weaknesses of the protected areas system in Albania are listed below:

To address the challenges posed by the complex legislative and strategic framework governing the Protected Areas in Albania, it is crucial to enhance **inter-agency coordination** between the national and regional protected area agencies and to strengthen the capacity of the central institution (NAPA) to streamline efforts across diverse laws and strategies.

Strengthening **local involvement through participatory governance models** is essential to integrate local actors in planning and management processes, fostering community ownership and engagement.

Building capacity by investing in training and human resources is necessary to effectively manage protected areas and water resources. Additionally, implementing robust monitoring systems with indicators and digital platforms can enable real-time tracking of biodiversity, tourism activities, and water resources, ensuring informed decision-making.

Also, promoting **policy integration by aligning national and local policies** (vertical integration) and fostering **collaboration across ministries and sectors** (horizontal integration) will create a cohesive and efficient framework for sustainable management and conservation efforts.

The **recently amended Law on Protected Areas** opens protected areas to broader development activities, potentially leading to environmental degradation. This development focus can clash with conservation efforts, putting stakeholders such as local communities and environmental groups in difficult positions. Insufficient political will, fragmented coordination across different government levels, and limited stakeholder engagement exacerbate these issues, making it challenging to enforce conservation policies effectively.

5.5.2 Vjosa Wild River National Park

IUCN has developed a global standard for the identification and promotion of well-managed protected areas, called the IUCN Green List of Protected and Conserved Areas (hereafter: GLPCA). This standard can serve as a basis for verifying the gap analysis in the achievement of the objectives for which the VWRNP was established.

The IUCN GLPCA is based on four pillars:

- **Pillar 1:** the protected area has an effective and equitable governance system in place.

  For the VWRNP, it is unfortunate to note that even after more than two years since its establishment, the protected area still has no management body, no manager and no staff. Some management tasks are carried out by staff from neighbouring protected areas, which not only undermines the work of the protected area, but also does not produce effective results for the VWRNP. Management tasks are spread over three geographical units managed by three RAPAs. Cooperation between RAPAs for the management of the VWRNP is poor, e.g. the VWRNP does not have a common way of carrying out monitoring or a strategy for visitor guidance. Decisions on the VWRNP are taken in Tirana, mainly at NAPA and in cooperation with the Ministry responsible for nature. The governance model is highly centralised. Cooperation with local stakeholders is weak.

  Similarly, there is no allocation for funding of the VWRNP in the state budget for 2025, further undermining the park's management and conservation objectives. Financial and resource constraints are a pragmatic reality that VRWNP must face. Securing sustainable funding streams and allocating resources efficiently will be critical to the implementation of the Integrated Management Plan (IMP).

- **Pillar 2:** the boundaries of the site are sufficiently comprehensive and include all the key elements for achieving the conservation objectives

  When signing the Memorandum of Understanding on establishment of the VWRNP, the Albanian authorities committed that the boundaries of the National Park would include not only the main Vjosa River and three tributaries (Shushica, Drino and Benca) but also other free-flowing tributaries, including the estuary part of the Vjosa River. This has not happened so far, and it would be reasonable to call on the authorities to fulfil their part of the bargain, as the ecological character of the free-flowing river depends on the flow of water and sediment coming from all tributaries.

- **Pillar 3:** the protected area is managed; there is an appropriate plan for this, the tasks under the plan are carried out and the status and performance of the park's objectives are monitored

  The Integrated Management Plan for the VWRNP was adopted in October 2024, but the capacity to implement the works and tasks under this plan is not ensured. Thus, no active measures for species and habitat protection are implemented in

the park, there is no invasive alien species control plan, no targeted monitoring of indicator species or habitat monitoring, no visitor management, etc. Enforcement is carried out in a very haphazard manner, with staff neither having the necessary equipment nor the necessary skills. Cooperation with the local community and stakeholders is very limited. Industrial abstractions of water and minerals are still taking place in the VWRNP, despite the restrictions imposed by the DCM establishing the park. There are virtually no visitor facilities in the park and the park has very limited engagement with the local community.

Pillar 4: achieving nature conservation results

Unfortunately, the VWRNP is still more of a 'paper park' than a properly governed and managed protected area. There are no concrete results, in particular no evidence that the conservation status of any species or the condition of habitats has improved as a result of the establishment and management of the park, nor can there be. A slightly better picture is expected in the future, as Albania has received tens of millions of euros in donor aid thanks to the establishment of the VWRNP, mainly to tackle environmental problems (water and soil pollution, waste disposal sites and sewage systems...).

5.5.3 Public perceptions analysis in relation to the Vjosa Wild River National Park.

A structured questionnaire formed the primary research component of the report, with 162 completed surveys providing insights into local community perceptions of water resource management.

Demographics of respondents on Vjosa Basin

The majority of respondents to the survey are from regions adjacent to the Vjosa River—45.7% from Vlore, 27.2% from Tepelenë, and 21.6% from Përmet—indicating these areas' strong engagement and direct interest in the VRWNP. These regions are key to the VRWNP's management, reflecting their stake in the river's wellbeing. Other regions like Gjirokaster, Tiranë, Fier, Këlcyrë, and Këlcyrë are less represented, suggesting a lesser impact from VRWNP or lower survey awareness. The concentrated feedback from Vlorë, Tepelenë, and Përmet underscores the importance of tailoring the VRWNP's management to these areas' specific concerns and needs for effective implementation.

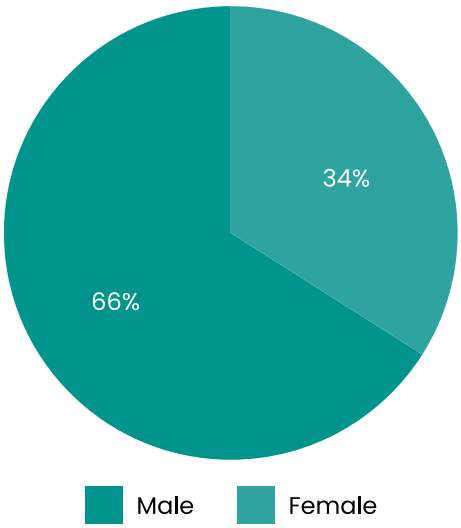

Figure 29:

Gender composition of respondent (N=162).

Source: Local stakeholder's survey

Survey results indicate that 66% of the respondents are male, 34% are female, which could suggest that men might be more involved or have greater access to the survey medium, or it might reflect the gender dynamics of engagement in issues related to water resource management in the Vjosa River Basin area. However, for a more comprehensive understanding of community needs and perspectives, it would be beneficial for future surveys to aim for a more balanced gender representation.

This could potentially unveil different priorities and insights, which is important for inclusive management planning in the VRWNP.

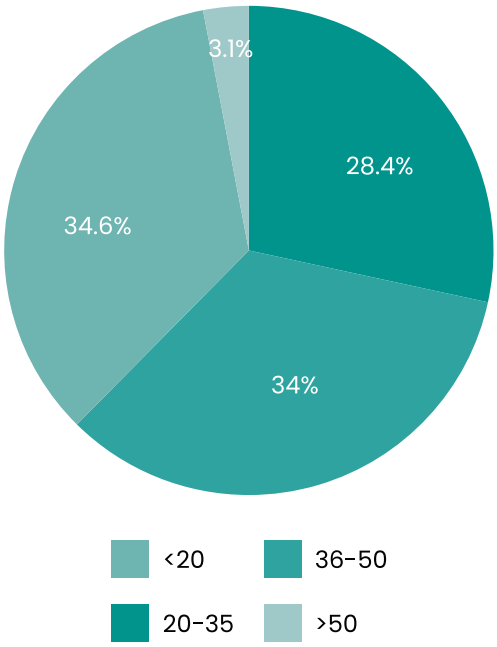

Figure 30:

Age distribution among respondents

Source: Local stakeholder's survey

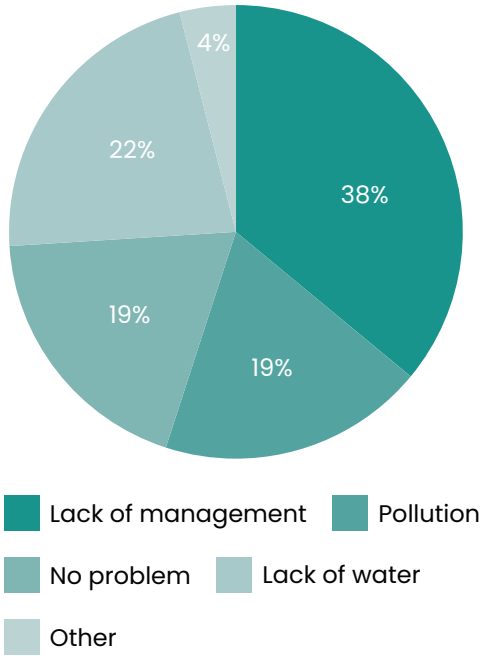

Figure 31:

Main issues concerning water resource management in percentage.

Source: Local stakeholder's survey

The age distribution among respondents is as follows: 34.6% are under 20 years old, 28.4% are between 20-35, 34% are between 36-50, and a smaller portion, presumably around 3%, are over 50. This distribution shows a relatively even spread across the younger and middle-aged groups, with less representation from the over-50 demographic. The strong involvement of younger individuals could indicate a higher level of engagement or concern among the youth and middle-aged adults about water resource management in the VRWNP. The lower participation of older adults could suggest a gap in outreach or engagement with this age group. For the VRWNP management plan, considering the priorities and perspectives across age groups is essential, especially since younger respondents may be the future factors in these water resources. Additionally, capturing the insights of older individuals could provide historical context and long-term observations of changes in water management practices.

High levels of corruption in Albania, as indicated by a Corruption Perceptions Index score of 37 (Transparency International, 2023), undermine trust in public institutions and significantly impact the Vjosa Wild River National Park (VWRNP) governance. This erosion of trust diminishes public confidence in enforcing conservation policies, leading to scepticism about the government's ability to manage protected areas effectively. Corruption facilitates selective enforcement of environmental regulations, allowing unauthorized development and resource exploitation. The lack of transparency and accountability weakens stakeholder engagement, creating barriers to collaborative governance and threatening the long-term preservation of the Vjosa River's unique ecosystem.

Based on the information provided in the questionnaire and the previous analysis made in this technical report the following questions have been elaborated regarding protected area management and the Vjosa River. Question six on the questionnaire asks to the respondents to mention their main issues concerning water resource management in the region. This question can directly relate to the Vjosa River's current management challenges.

1. **Lack of management**- This is the most frequently cited issue, with 70 respondents making up 38.3% of the total. It is the most pressing concern and points to a perceived deficiency in the effective administration of water resources. This could relate to insufficient policies, enforcement, or governance structures, and suggests a need for a more robust management framework within the VRWNP.

2. **Lack of water**- mentioned by 40 respondents, accounting for 21.9%, the scarcity of water is a significant concern. This issue is multifaceted and could involve insufficient water supply, drought, overuse, or allocation issues. It highlights the importance of developing sustainable water use practices and improving water conservation efforts within the VRWNP.

3. **Pollution**- With 19.1% of the responses, pollution is a significant concern. It indicates that nearly one-fifth of the respondents are worried about contaminants affecting water quality, which could stem from industrial discharge, agricultural runoff, or inadequate waste disposal. This concern is essential to address in the VRWNP management plan through strict regulation and monitoring of potential pollution sources.

4. **No problem**: Interestingly, 24 respondents (13.1%) do not perceive any problems with water resource management in their region. This could indicate satisfaction with current management practices or a lack of awareness about

5. **Other**: A smaller group of 8 respondents (4.4%) have concerns that fall outside the specified categories. This suggests that there are other miscellaneous issues affecting some individuals, such as waste disposals and erosion, however, it may require further investigation to understand and incorporate into comprehensive management strategies.

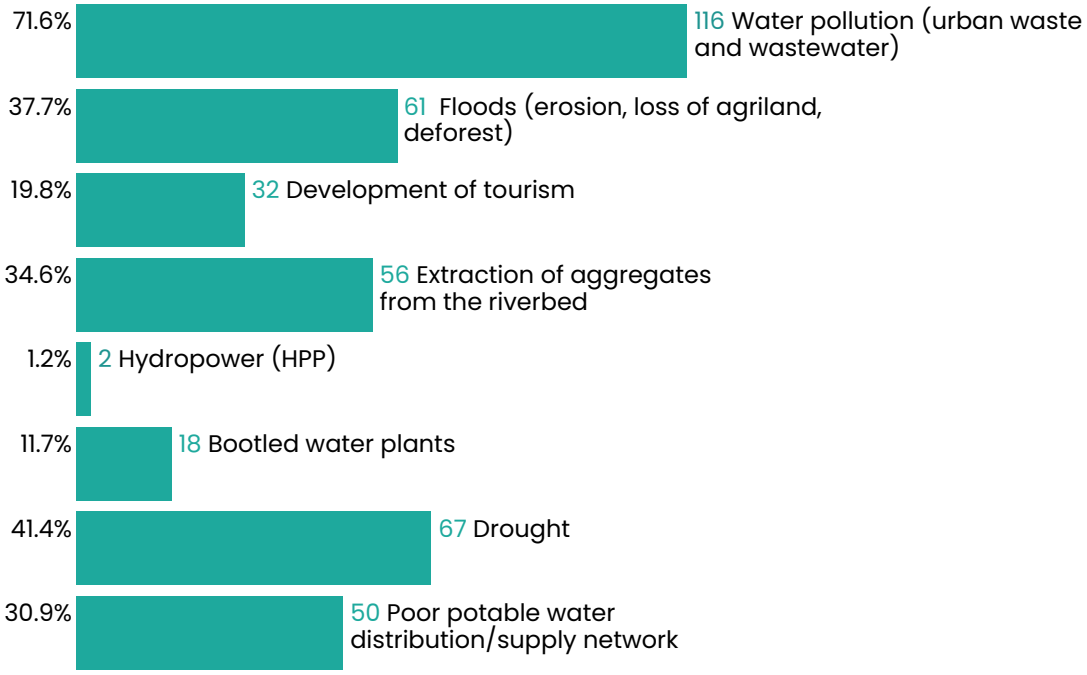

Figure 32: **Water resources in risk and its related factors in Vjosa Basin.**

Source: Local stakeholder's survey

Most respondents indicate significant challenges in managing water resources in the Vjosa Basin, particularly emphasising the lack of management and pollution. The high percentage of concerns around management indicates a critical need for reviewing and potentially overhauling current management approaches, focusing on creating an integrated, sustainable water management plan. Such a plan should incorporate pollution control, efficient resource allocation, stakeholder engagement, and conservation strategies to effectively manage the VRWNP's water resources. Additionally, considering that a notable portion of respondents did not indicate any issues, there may be a need for increased public awareness and education about the challenges facing water resources in the region. In addition, water resources at risk and its related factors in Vjosa Basin are explored to help in planning resource allocation in the VRWNP.

Most respondents (71.6%) have identified water pollution as the primary issue, specifically from urban waste. They are followed by concerns about flooding and erosion (37.7%), which could be linked to tourism development and its environmental impact. The capture of inert materials from the riverbed (34.6%) is also a significant concern, likely indicating the disruption of natural river dynamics and potential ecological harm. Other notable issues include hydro energy projects (1.2%), which, while not as frequently mentioned, still represent an essential aspect of water resource management due to their potential impact on ecosystems. Inadequate water distribution networks (30.9%) and scarcity (41.4%) are significant problems. This indicates that a substantial portion of the population experiences difficulty accessing water, affecting daily living and agricultural practices.

Linking this to the broader context of water management in the Vjosa Wild River National Park (VRWNP), the survey highlights several critical topics for consideration in the integrated management plan:

1. Pollution Control: Strategies must be in place to prevent urban runoff and waste from contaminating water sources.

2. Flood Management: With a substantial percentage worried about flooding and erosion, it is clear that the management plan should incorporate robust flood mitigation and riverbank stabilization measures.

3. Resource Extraction: The capture of inert materials suggests a need for regulating extraction to prevent ecological damage.

4. Hydro energy: While not a widespread concern, the impact of hydro energy projects on the natural flow and ecosystem health cannot be ignored.

5. Water Distribution is a significant concern, which should prompt the plan to improve infrastructure to ensure consistent and equitable water distribution.

6. Water Scarcity: Given its prevalence, measures to address water scarcity, such as water-saving technologies and drought-resistant crops, could be vital.

The analysis of these concerns should guide the development of a holistic approach to managing the VRWNP, ensuring the conservation of its natural heritage and the sustainable use of its resources for the benefit of local communities.

The Figure 33 show results on the primary sources from which respondents obtain drinking water. This seeks the main source of drinking water, which is relevant to ensuring sustainable water supply in the protected area.

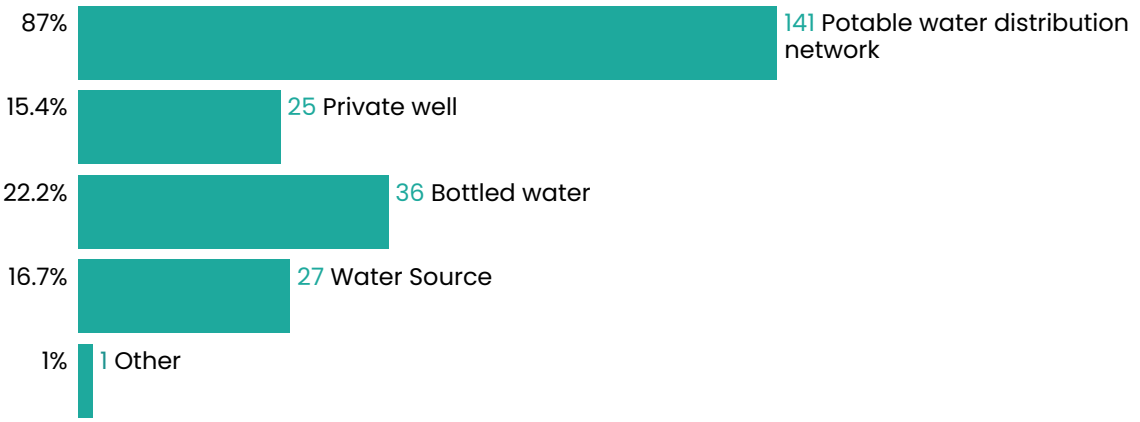

Figure 33: **Where do you get your drinking water.**

Source: Local stakeholder's survey

The majority, representing 87% (141 respondents), rely on the public water distribution system, indicating that this is the most trusted and widespread source. Bottled water is the next most common source, used by 22.2% (36 respondents), which may suggest concerns about the reliability or quality of tap water or be a choice of convenience.

Private wells are used by 15.4% (25 respondents), and a smaller segment, 16.7% (27 respondents), obtain water directly from natural sources. Notably, these percentages add up to over 100%, indicating that respondents could select multiple sources for their drinking water.

This information is crucial for the management of the VRWNP for several reasons:

1. **Infrastructure and Accessibility:** The heavy reliance on public water distribution systems suggests that maintaining and improving this infrastructure should be a key focus for park management, ensuring consistent and clean water supply.

2. **Water Quality:** The use of bottled water by a significant minority implies concerns about water quality, which the park management must address, potentially by implementing water purification initiatives or community education programs.

3. **Sustainability:** The use of private wells and direct natural sources can have implications for sustainability, particularly in terms of groundwater depletion and the ecological impact of water extraction. Management strategies could include monitoring and potentially regulating the use of these sources to ensure they are sustainable.

4. **Community Engagement:** Engaging with the community on issues of water quality, conservation, and infrastructure development is essential to foster sustainable practices and support for VRWNP initiatives.

In the Figure 34 are identified water-related challenges such as pollution, flooding, and hydro energy, which are directly relevant to the river's management plan.

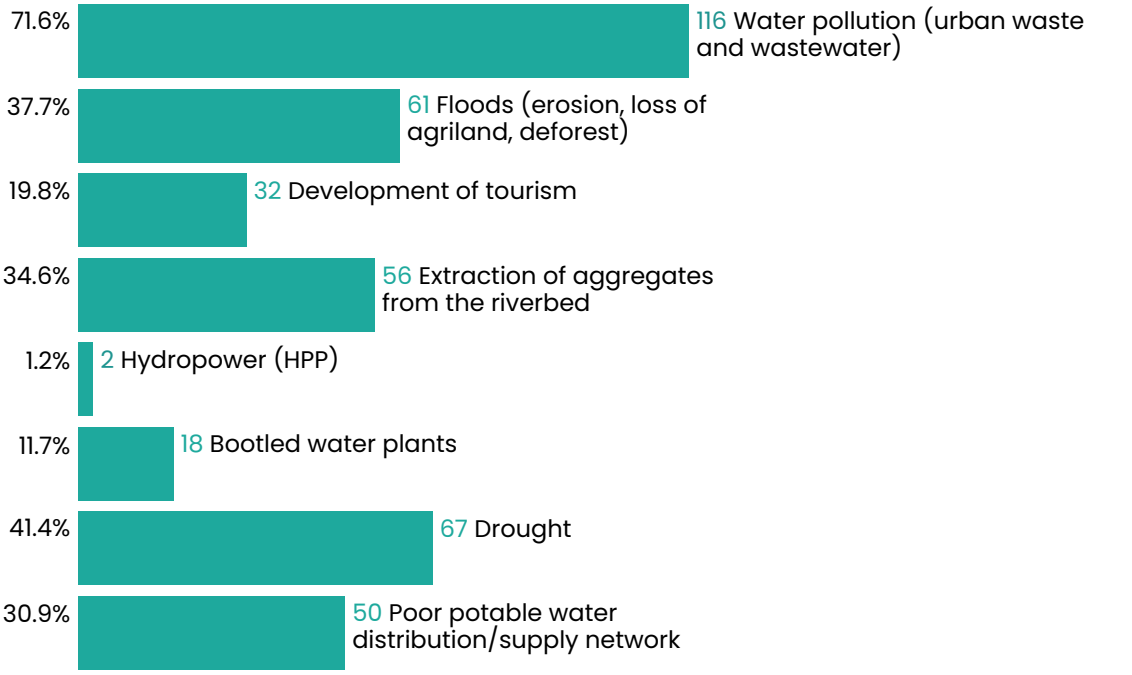

Figure 34: **Primary concerns regarding water resource management within the Vjosa Basin.**

Source: Local stakeholder's survey

The survey showed the following concerns regarding the Vjosa River: **71.6%** of respondents identified water pollution, specifically urban waste, as their primary concern. **41.4%** of respondents were concerned about drought, highlighting the relevance of climate change and its impact on water availability. Flooding and erosion issues were significant for **37.7%**, reflecting the importance of effective water management for flood prevention and response. **31%** of respondents identified a weak distribution network, emphasizing the need for improved infrastructure to ensure consistent water supply. Tourism and development impacts were cited by **19.8%** of respondents, indicating concerns over the strain on water resources and infrastructure due to these activities. Water infrastructure issues were noted by **11.1%**, and finally, hydro energy projects were a concern for only **1.2%** of respondents, suggesting limited awareness or direct experience with these projects. These results highlight a critical gap in understanding the primary purpose of the Vjosa Wild River National Park, which is the protection of biodiversity and natural processes.

Most of the identified challenges relate to threats that also affect humans. At the same time, the intrinsic values of the park, such as the protection of native biodiversity and the preservation of natural ecosystems, appear to be underappreciated. This underscores the need for greater public education and awareness about the park's fundamental goals to ensure a more holistic understanding and support for its conservation efforts.

Participants were asked to select up to two alternatives and choose the most important factors they believe are most responsible for the issues affecting the Vjosa River.

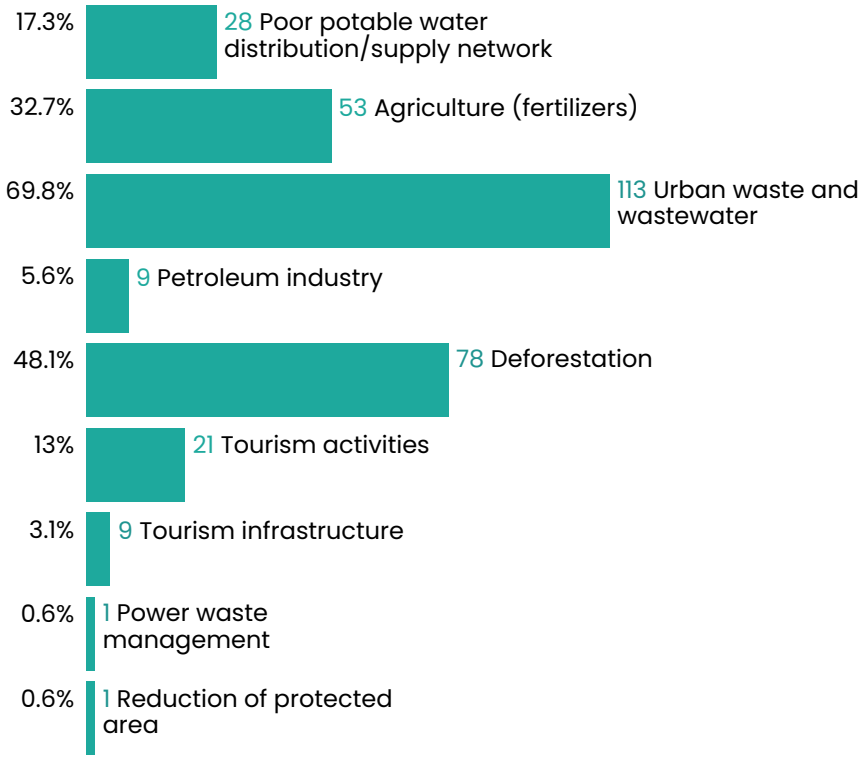

Figure 35: **The most important factors affecting the Vjosa River.**

Source: Local stakeholder's survey

The findings highlight key areas of concern among respondents, with **69.8% identifying urban waste** as the most significant contributor to the river's issues, followed by **tourism activities (48.1%), agricultural impacts such as pesticide use and soil fertility (32.7%)**, and **weaker water distribution infrastructure (17.3%)**. While these aspects are critical for the health and management of the Vjosa Wild River National Park (VWRNP), it is important to clarify that these are primary concerns raised by local communities and not the core objectives of the integrated management plan for the VWRNP. The park's primary aim is to protect biodiversity, natural processes, and the ecological integrity of the Vjosa River and its tributaries.

Nonetheless, these community-raised concerns about urban waste, pollution, and agricultural impacts should not be dismissed; they must be addressed by the relevant institutions responsible for managing these issues, such as municipalities, water basin agencies, and environmental authorities, in alignment with the existing legislative and strategic frameworks. For instance, urban waste management falls under the **Law on Environmental Protection (No. 10431)** and related municipal responsibilities. At the same time, agricultural impacts are covered by the **Agriculture, Rural Development, and Fisheries Strategy (2021–2027),** which emphasizes sustainable farming practices. Tourism-related concerns must be balanced with conservation needs as outlined in the **National Strategy for Tourism Development (2024–2030).**

The integrated management plan for the VWRNP is focusing on maintaining the river's ecological character and biodiversity by emphasizing intrinsic values, such as preserving natural habitats and species. However, given the interconnected nature of these issues, the plan must also advocate for better coordination among institutions and stakeholders to ensure that urban waste, tourism, and agriculture do not compromise the park's primary objectives. A collaborative approach, leveraging the multitude of legislative instruments like the **Law on Protected Areas (No. 81/2017)** and the **General National Spatial Plan (GNSP 2030),** will ensure that these community concerns are adequately addressed by the appropriate entities while allowing the VWRNP to focus on its core mission of biodiversity conservation. Public education and awareness campaigns can also help bridge the gap in understanding the park's primary aims and the role of other institutions in managing anthropogenic pressures.

Respondents in the region are asked to rank the importance of various aspects of sustainable water management, directly informing the integrated management approach for VRWNP.

Figure 36 shows respondents' views on the importance of different aspects of sustainable water resource management in the Vjosa Basin.

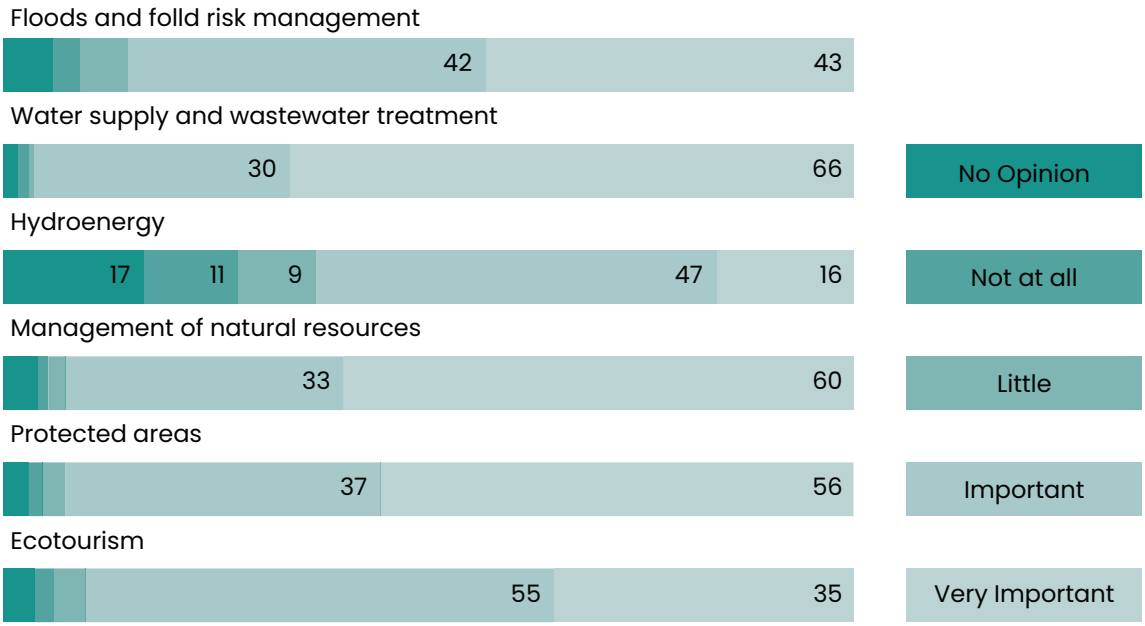

Figure 36: **Importance of different aspects of sustainable water resource management in Vjosa Basin.**

Source: Local stakeholder's survey

These findings highlight the community's prioritization of flood management, water supply, and sustainable management of natural water resources as key areas for the VWRNP management plan. Floods and Flood Management received the highest number of responses in the "Very Important" category, reflecting significant concern among respondents about the impacts of floods and the need for effective flood control. However, it is important to emphasize that floods are a natural process and one of the reasons for which the National Park was established—to preserve the river's ecological dynamics, including natural flooding regimes. Mitigating flood impacts in the Vjosa River basin should prioritize nature-based solutions (NBS) rather than relying solely on traditional engineering approaches.

Nature-based solutions, such as restoring wetlands, reconnecting floodplains, and enhancing riparian vegetation, can play a critical role in managing flood risks while maintaining the natural hydrological processes of the river. For example, floodplains act as natural buffers, absorbing excess water during flood events and reducing downstream flooding (IPCC, 2019; IUCN, 2020). Similarly, riparian vegetation can stabilize riverbanks, reduce erosion, and slow water flow, mitigating flood intensity (WWF, 2021). These measures align with the principles of the Law on Protected Areas (No. 81/2017), which advocate for maintaining the natural state of ecosystems and supporting ecological stability.

Incorporating NBS into the VWRNP management plan would provide multiple co-benefits, such as enhancing biodiversity, improving water quality, and supporting ecosystem services that benefit both nature and local communities (European Commission, 2021). Public engagement and education should focus on raising awareness about the value of these natural processes and how NBS can address concerns about floods in a way that aligns with the park's conservation goals. This approach would ensure flood management contributes to ecological preservation and community safety, creating a sustainable framework for managing one of the Vjosa River's most critical natural dynamics.

Finally, performance of institutions responsible for water resource protection, which is essential for governance analysis is evaluated.

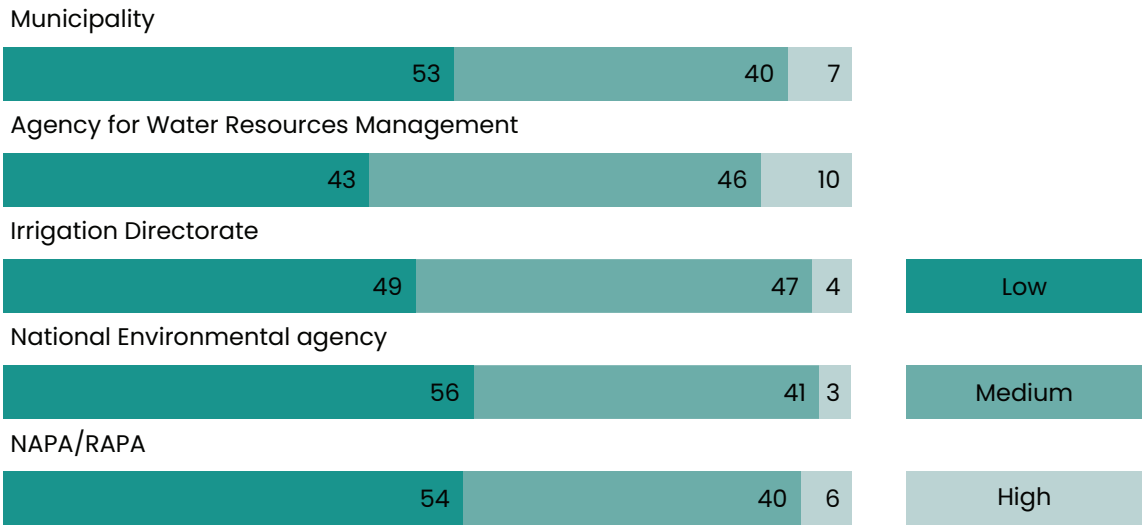

Figure 37: **Public perception on the responsible institutions performance for water resource protection.**

Source: Local stakeholder's survey

Municipality

The Figure 37 shows that low satisfaction is predominant for the municipality, with fewer respondents indicating medium satisfaction and an even smaller percentage selecting high satisfaction. This indicates a significant gap in public trust regarding the municipality's efforts in water resource protection. Given the municipality's critical role in managing urban waste, maintaining infrastructure, and enforcing local environmental regulations, this dissatisfaction reflects public concern about inadequate performance or communication. For the VWRNP, this could pose challenges in achieving effective waste management and community engagement, requiring urgent transparency, collaboration, and service delivery improvements.

Analyses of the AMBU/(Vjosa River Basin Authority) responses

The AMBU/ZABU Vjosa responses are more evenly spread, with medium satisfaction being the most common, followed by low satisfaction, and a smaller proportion indicating high satisfaction. This suggests that while the Vjosa Basin Authority is perceived as moderately effective, significant portions of the public still view its performance as lacking. As the body responsible for managing water resources in the basin, AMBU must address these perceptions by improving basin-wide coordination, ensuring transparent decision-making, and actively engaging with local stakeholders. For the VWRNP, enhanced public trust in AMBU is critical for implementing sustainable water management strategies and preventing resource conflicts.

Analyses of the responses given by the Irrigation Directorate

The Irrigation Directorate has the highest percentage of low satisfaction ratings, with medium satisfaction trailing behind, and very few respondents indicating high satisfaction. This highlights widespread public concern about the Directorate's effectiveness in managing irrigation systems. Ineffective irrigation practices can seriously affect water allocation, especially in a protected area like the Vjosa River, where over-extraction or poor practices can disrupt ecological balances. The Directorate must prioritize sustainable irrigation management, align its operations with conservation goals, and collaborate with other stakeholders to address these concerns. Public dissatisfaction in this area could hinder efforts to balance ecological preservation with agricultural needs in the region.

Analyses of the responses given by the National Environmental Agency (NEA)

The results show that low satisfaction dominates responses for the NEA, with fewer respondents indicating medium satisfaction and the smallest percentage selecting high satisfaction. This reflects public dissatisfaction with the NEA's environmental protection and monitoring performance. As the agency responsible for enforcing environmental standards, this perception raises concerns about its ability to support the VWRNP's objectives effectively. The NEA must improve its on-ground enforcement capacity, increase transparency, and ensure more active collaboration with local stakeholders. For the VWRNP, the NEA's perceived ineffectiveness could undermine conservation efforts and water and biodiversity regulations enforcement.

Analyses of the responses given by the NAPA/RAPA-s

The responses for NAPA/RAPA-s indicate a relatively balanced distribution, with high satisfaction leading, followed by medium satisfaction, and a smaller portion of low satisfaction. This suggests that while their efforts in managing protected areas and biodiversity conservation are recognized and appreciated by a segment of the public, there are still significant concerns among other respondents. For the VWRNP, this presents an opportunity for NAPA to build on its strengths by reinforcing its management efforts, addressing gaps in stakeholder engagement, and improving its visibility and communication strategies. Consistent performance and community involvement further solidify public support and enhance the park's conservation outcomes.

Impact of Public Perceptions on the VWRNP

The varying public perceptions of these institutions reflect their effectiveness and trustworthiness in managing water and environmental resources, which directly impacts the success of the VWRNP. High dissatisfaction levels for the municipalities, NEA and the Irrigation Directorate highlight gaps in waste management, environmental enforcement, and water allocation, all of which are critical to the park's management plan. Conversely, the relatively higher satisfaction with NAPA/RAPA-s indicates that they are seen as a cornerstone for conservation. However, they must collaborate with other agencies to bridge gaps in coordination and performance. These perceptions underscore the need for institutional reforms, improved public communication, and integrated governance to align efforts with the park's biodiversity and sustainability goals.

5.6 Management responses

5.6.1 For the system of Protected Areas in Albania

Following the desk research and primary data findings we outline in the table below the main challenges and corresponding management responses aimed at improving the effectiveness and sustainability of the protected areas in the Vjosa Basin. It identifies specific areas of concern, such as insufficient staff capacity development, lack of comprehensive management plans, insufficient promotion of sustainable tourism, and the need for more effective community engagement and education. For each issue identified, the table proposes strategic actions to address these challenges through professional development, stakeholder collaboration, and the improvement of both infrastructure and promotional efforts. These management responses are critical to ensure the long-term preservation and prosperity of the Vjosa Basin's ecological and socio-economic environment.

Issue 1

Insufficient Capacity Development in National and Regional Protected Area Agencies

There is a critical need to ensure the ongoing development of technical and logistical capacities among personnel at the National Agency of Protected Areas (NAPA) and Regional Administrations of Protected Areas. Currently, staff may not be adequately equipped or up to date on the latest methodologies and technologies required for effectively planning, managing, promoting, and monitoring protected areas. These issues could hinder conservation efforts' overall efficacy and responsiveness within the agency.

Measure 1

Continuous Professional Development Programs
Develop and implement a continuous professional development program that includes regular training sessions, workshops, and seminars. These programs should cover the latest trends and technologies in conservation management, policy updates, and effective area management practices. This will ensure that the staff's skills and knowledge are current and comprehensive.

Measure 2

Partnerships with Academic and Research Institutions
Establish partnerships with universities, research institutions, and other conservation organizations. These partnerships can facilitate staff access to cutting-edge research, new methodologies in environmental management, and opportunities for collaborative projects.

Measure 3

Implementation of a Mentorship and Leadership Development Program
Create a mentorship program that pairs less experienced staff with seasoned experts in specific areas of protected area management. Additionally, develop a leadership training program to prepare senior staff for greater responsibilities.

Measure 4

Technology Upgrades and Access to Tools
Provide ongoing access to the latest tools and technologies relevant to protected area management. This includes Geographic Information Systems (GIS), remote sensing technology, and data management software.

Issue 2

Lack of Comprehensive Management Plans

The need for management plans in Protected Areas (PAs) arises because effective conservation often requires holistic planning beyond a single area, even when focusing on a specific site like the Vjosa Wild River National Park (VWRNP). While an Integrated Management Plan (IMP) for VWRNP does exist, the effectiveness of its implementation may depend on the broader context of Albania's conservation framework, which includes other connected or neighboring PAs.

Measure 1

Establish an Integrated Planning Task Force
Form a task force comprising members from the National Agency of Protected Areas (NAPA), regional environmental agencies, water resource management bodies, and other relevant stakeholders. This task force will be responsible for overseeing the development and revision of management plans to ensure they align with the Water Resources Management Plan for the Vjosa Water Basin.

Measure 2

Conduct Comprehensive Environmental Assessments
Implementation: Perform thorough environmental assessments to gather current data on biodiversity, water quality, land use, and socio-economic factors affecting the Vjosa Basin. This information will serve as the foundation for both new and revised management plans.

Measure 3

Stakeholder Engagement and Public Participation
Develop a framework for active participation by local communities, NGOs, and other stakeholders in the planning process. This should include public consultations, workshops, and regular updates to keep the community informed and involved.

Measure 4

Develop and Implement Training Programs
Initiate training programs for all agencies involved in the management of the Vjosa Basin. These programs should focus on integrated management practices, conflict resolution, and adaptive management techniques to address changing environmental conditions.

Measure 5

Monitoring and Evaluation Systems
Establish robust monitoring and evaluation systems to regularly assess the effectiveness of the management plans and make adjustments as necessary. This system should include indicators for ecological health, water quality, and community engagement.

Issue 3

Insufficient Promotion and Revenue Generation from Sustainable Tourism

Sustainable tourism forms such as ecotourism and agro-tourism are under-promoted, impacting potential revenue streams.

Measure 1

Development and Implementation of a Targeted Marketing Strategy
Develop a comprehensive marketing strategy that highlights the unique aspects of each PA, focusing on their ecological significance and the sustainable tourism opportunities they offer.

Measure 2

Partnership with Eco-Tourism Operators
Establish partnerships with eco-tourism operators and local businesses to create and promote tourism packages that align with IUCN standards. These packages should offer visitors authentic and low-impact tourism experiences, such as guided wildlife tours, bird watching, and cultural heritage tours.

Measure 3

Enhancement of Visitor Facilities and Services
Invest in enhancing the infrastructure and visitor services within the PAs to improve the overall tourist experience. This can include developing visitor centres, improving signage, offering educational programs, and ensuring that facilities are eco-friendly and enhance the natural experience without disrupting the environment.

Issue 4

Revenues generated within PAs are not adequately reinvested, affecting the sustainability of these areas.

Measure 1

Ensure that revenues generated within the PA are reinvested in the area itself, supporting improvements in management, monitoring, and promotion of the PAs, and contributing to the welfare of local communities.

Issue 5

Lack of Community Engagement and Education

There is a need for greater educational and awareness initiatives to highlight the significance of the PA network in the Vjosa Water Basin.

Measure 1

Advocate for educational and awareness initiatives that emphasize the role of the PA network in conserving biodiversity and fostering sustainable growth within local communities.

Issue 6

Stakeholder Collaboration and Empowerment

There is insufficient collaboration among stakeholders, which hampers effective management and sustainable development.

Measure 1

The establishment of a multi-stakeholder forum will enhance communication and collaboration among all parties involved, ensuring that diverse perspectives and expertise are incorporated into the management of PAs. It will also build stronger relationships and trust among stakeholders, which are crucial for the long-term sustainability of conservation efforts.

Issue 7

Lack of a Defined Unique Selling Proposition (USP)

The region lacks a clear USP that integrates ecotourism and sustainable development principles.

Measure 1

Elaborate a unique selling proposition that encompasses both ecotourism and sustainable development principles while maintaining the ecological integrity of the Vjosa Basin.

Issue 8

Need for an Inclusive Management Approach

Current management practices do not fully consider the various ecosystem services provided by the Vjosa Basin.

Measure 1

Encourage an inclusive management approach that considers various ecosystem services within the Vjosa Basin, fostering favorable economic, social, and environmental benefits for local communities.

5.7 Conclusions

- In light of the analysis of primary and secondary sources as well as the questionnaires completed by stakeholders whose responses related to the management of the VWRNP, the following conclusions can be drawn regarding the management and governance of protected areas in Albania, with a focus on the Vjosa Wild River National Park (VWRNP):

- Lack of and weak management capacity is one of the weaknesses of the protected area system in Albania; the lack of a dedicated management body and sufficient staffing for VWRNP highlights a significant governance gap for this newly established national park.

- The centralized decision-making approach limits the engagement and responsiveness of local stakeholders, which reduces the effectiveness of conservation efforts. Poor inter-agency coordination impairs management effectiveness, which is particularly evident in VWRNP, where the lack of collaboration between the three RAPAs managing the park hinders integrated management practices.

- The current boundaries of the VWRNP do not include critical free-flowing tributaries and the estuary, undermining the ecological connectivity and integrity required for effective conservation. Fulfilling the original commitments to include these areas is essential to achieving the Park's conservation objectives.

- The development and implementation of protected area management plans is essential for achieving the conservation objectives of protected areas in Albania. The Integrated Management Plan for VWRNP, adopted in 2024, lacks the resources necessary for its effective implementation, including trained staff, funding and equipment. Important conservation measures, such as invasive species control, habitat restoration and species monitoring, remain largely unimplemented. Industrial activities such as mineral extraction continue in the VWRNP, contradicting conservation goals.

- Local communities along the VWRNP face significant challenges, including pollution, water scarcity and inadequate management, which need to be addressed to build trust and support for the park. Awareness campaigns are crucial to increase public understanding of the primary conservation objectives of the protected area and to emphasize biodiversity and ecological dynamics over anthropocentric concerns.

- While the Albanian legal framework for protected areas is largely in line with international standards, there is a risk that recent legislative changes prioritize development over protection. A lack of political will and fragmented coordination between levels of government hinder the implementation of conservation policy.

- The significant donor assistance Albania receives for environmental management and protected area administration provides an opportunity to address identified gaps in protected area management through targeted investment in administration, capacity building and ecological restoration. Developing a decentralized governance model, strengthening inter-agency coordination and leveraging partnerships with stakeholders are critical for effective management of the VWRNP.

- The findings from 162 stakeholder interviews underline the need for increased engagement and education to ensure that all stakeholders understand the environmental and economic importance of the Vjosa River. There is a clear need to improve management practices, particularly in areas such as pollution control, water resource management and infrastructure development. Furthermore, the promotion of sustainable tourism is proposed in order to make economic use of the Vjosa's natural attractions while preserving its ecological integrity.

- Finally, continuous research and environmental monitoring are considered crucial to assess the impacts of both natural and anthropogenic changes to support informed decision-making and adaptive management practices. The ultimate goal for management of the VWRNP should be to maintain the ecological integrity of the Vjosa River while balancing the needs of human development in the wider Vjosa River Basin.

- This requires the commitment of all stakeholders, including government authorities, local communities and international partners, to work together for the long-term sustainability of the Vjosa's unique landscape.

6

Ecotourism in the Vjosa Basin

Expert: Dr. Klodian Muço

Executive summary

This technical report on the development of the ecotourism sector in the Vjosa Valley has been prepared within the framework of the ESPID4Vjosa Programme, implemented by Euronatur and EcoAlbania, with financial support from the Austrian Development Agency (ADA). The objective of this study is to evaluate the potential and opportunities for the development of ecotourism as an industry that can contribute to the conservation of biodiversity, economic development and protection of the natural environment of this rich and ecologically important area.

Albania has considerable potential for the development of tourism in general, with the tourism sector identified as a key area for the country's economic development, contributing approximately 20% of GDP by 2023. Ecotourism presents a novel avenue for sustainable development and economic advancement, contingent on the avoidance of any adverse impact on natural resources. This is particularly pertinent in the context of protected areas such as the Vjosa Valley. As indicated in the Global Ecotourism Network report (2020), ecotourism represents a significant proportion of the global tourism market, accounting for approximately 20-25%. The Vjosa Valley encompasses a multitude of ecologically diverse regions, home to over 1,000 species of flora and approximately 200 species of fauna. Additionally, the valley serves as a habitat for 13 internationally endangered fauna species, underscoring the significance of this region as a biodiversity hotspot.

The analysis of tourism data for the Gjirokaster region indicates that approximately 25,000 tourists per year from Europe and the region visit the Vjosa Valley, motivated by an interest in the area's natural and cultural attractions. This figure represents a double-digit growth rate for 2023. It is estimated that for every 1,000 tourists visiting the Vjosa Valley, approximately 30 to 40 direct and indirect jobs can be created in the tourism and agriculture sectors. Furthermore, ecotourism provides a foundation for agritourism, which in turn offers opportunities to gain familiarity with traditional lifestyles, crafts, and local foods. An analysis of the development of tourism in Albania has revealed that the sectors of agrotourism and ecotourism have experienced the most rapid growth in terms of visitor numbers in recent years. However, this growth has been accompanied by a series of challenges.

The hasty shift towards this form of tourism, devoid of a strategic plan for the advancement of ecotourism in the Vjosa Valley, could result in a significant expansion that would inevitably lead to environmental degradation. Conversely, this could result in irreparable damage to a protected area such as the Vjosa Valley.

In order to address these challenges, it is recommended that a sustainable infrastructure be developed and that investments be made in ecotourism opportunities. This approach could result in a sustainable increase in visitor numbers and economic benefits without causing harm to the natural environment. Furthermore, it is recommended that the legislation on tourism in protected areas be revised and that cooperation with the local community be enhanced with a view to developing tourism infrastructure that is environmentally sustainable. In conclusion, this technical report on ecotourism with a focus on the Vjosa Basin identifies shortcomings in the institutional aspect and suggests measures that can be implemented by central and local institutions, the academic world and the local government that extends along the valley in question.

6.1 Introduction

6.1.1 General Overview

Ecotourism is a form of tourism that has gained significant popularity in recent decades as a means of experiencing the natural and cultural heritage of pristine regions while engaging with the environment in a responsible and sustainable manner (Buckley, 2009; Garg & Srivastav, 2021; Ismail et al., 2021).

This type of tourism is renowned for the opportunities it presents for the conservation of natural resources and the sustainable development of local communities, while simultaneously offering an educational experience for visitors (De Zoysa, 2022; Huang et al., 2023; Blanton et al., 2024).

The Global Ecotourism Network (GEN, 2020) posits that ecotourism can be defined as responsible travel to natural areas that protect the environment, support the socio-economic well-being of local populations, and create opportunities for learning and understanding nature through interpretations and educational activities.

Fennell (2004) defines ecotourism as a form of tourism based on natural resources, with a primary focus on experiencing and learning about nature. It is ethically managed to have a low impact and support local development. In this context, ecotourism represents a significant opportunity for transforming the development of the tourism sector in Albania, offering new avenues for sustainable growth. However, in order to fully comprehend the function and prospective impact of ecotourism in Albania, it is essential to elucidate certain pivotal terms utilized throughout this report, such as "mass tourism."

This phenomenon encompasses the movement of vast numbers of organized tourists who visit renowned destinations for recreational purposes. It is characterised by the use of standardised packages (Abram & Waldren, 2021) as well as an increase in air traffic, which has resulted in significantly reduced ticket prices. This is an important factor in the context of mass tourism (Naumov & Green, 2014). The Albanian Riviera is a popular summer tourist destination in Albania. The term "nature-based tourism" encompasses all forms of tourism where the primary attraction is a reduced natural environment.

Such activities include nature walking, mountaineering, rafting and more, where the natural environment is left undisturbed and serves an educational and recreational purpose. As posited by Buckley (2021) and Newsome & Perera (2023), nature-based tourism represents a form of tourism that prioritises visits to pristine natural environments, conferring social, mental and environmental benefits. The concept of sustainable tourism entails the management of resources in a manner that fulfils the economic, social and aesthetic needs of the present generation, while simultaneously ensuring the preservation of cultural integrity, essential ecological processes, biodiversity and life support systems (United Nations Sustainable Development Knowledge Platform).

The objective of this type of tourism is to achieve a balance between economic development and the conservation of natural resources, as well as respect for the environment. In the Albanian context, Albania has traditionally been a well-known destination for beach tourism (Kadiu et al., 2021), with the majority of visitors opting for short stays and minimal expenditure. As evidenced by INSTAT data (2024) and the statistical yearbook (2023), Albanian tourism has experienced a notable surge in recent years, reflecting a shift from mass beach tourism towards a diversification of activities and destinations.

The Vjosa River Basin represents a significant potential for mountain tourism and ecotourism. The Vjosa River is regarded as one of the last remaining undammed rivers in Europe, with its tributaries originating in the mountains of Greece and flowing naturally into the Adriatic coast of Albania. The river creates an ecosystem that is rich in both national and global biodiversity.

Tourism in the Vjosa River Region has exhibited a gradual increase, particularly in recent years, as nature and wildlife tourists have begun to engage in activities such as hiking and rafting, with a primary focus on enjoying the natural environment and the cultural values of the area (Statistical Office of the Municipality of Gjirokaster, 2024; Information Office, Gjirokaster Prefecture, 2024).

The development of ecotourism in the Vjosa Valley presents a promising avenue for diversifying the Albanian tourism sector, offering a sustainable alternative to mass beach tourism. The designation of the Vjosa River ecosystem as a National Park will facilitate the conservation of biodiversity, promote sustainable development and enhance the well-being of the local community. It is imperative that local communities are engaged and empowered if ecotourism in this region is to succeed.

By incorporating local residents into tourism initiatives and emphasising the value of conserving natural resources, while also providing economic incentives through responsible practices, ecotourism has the potential to become a catalyst for sustainable development. Community-based tourism initiatives provide visitors with the opportunity to stay in accommodations managed by local residents, enjoy traditional cuisine, and engage in cultural exchanges that highlight the unique heritage of the Vjosa community.

This report will examine the opportunities and challenges of ecotourism development in this region, proposing a framework for nature conservation and sustainable tourism development. This framework is presented as an alternative that supports not only tourism, but also the well-being and economic development of the communities in the area.

6.1.1.2 Purpose of the study

The objective of this report is to provide an in-depth analysis of the opportunities and challenges related to the development of ecotourism in the Vjosa River Basin, part of which has recently been designated a national park (the Vjosa Wild River National Park, comprising mainly the river and the first level floodplain areas and three tributaries).

- The objective of the first part of this report is to provide a comprehensive review of the ecotourism sector in Albania, along with an analysis of the national and local policies and strategies that directly or indirectly influence the growth of ecotourism and sustainable tourism in the country.

- Section 2 will present an analysis of the current situation of the ecotourism sector in Albania, with a particular focus on the opportunities and challenges related to the development of ecotourism in the Vjosa Valley. This section will also undertake a review of the existing tourism situation and tourism infrastructure in this valley, as well as an assessment of the plan for the promotion of nature-based tourism in this area. In addition, the potential of the region's natural and cultural resources will be evaluated.

- Section 3 will analyse the political, legal and institutional framework of the ecotourism sector, including national and local policies that can support the development of ecotourism in the Vjosa Valley. Furthermore, this section will examine the policies and legislation that regulate the protection of nature and the utilisation of natural resources, with the objective of achieving sustainable and responsible development that respects the natural environment.

- Section 4 will present a detailed analysis of the shortcomings of the ecotourism sector in Albania, with a particular focus on the challenges faced in the Vjosa Valley. This section will identify the principal obstacles to the development of ecotourism, including the absence of infrastructure, difficulties in the management of natural resources and the lack of comprehensive involvement of the local community in decision-making processes.

- In Section 5, the measures and recommendations to address the identified gaps will be discussed. These include the development of strategies for improving tourism infrastructure, the involvement of the local community and the assurance of sustainable management of natural resources.

- Section 6 is devoted to the Vjosa Wild River National Park and Valley Tourism Master Plan, which aims to establish a globally recognised model for sustainable tourism. The plan seeks to strike a balance between the preservation of nature and the provision of tangible benefits for local communities. It prioritises low-impact, high-value tourism, guided by key principles such as biodiversity conservation, responsible business practices, and adherence to global sustainability standards. Furthermore, the plan emphasises respectful engagement with local culture and the natural environment, fostering economic opportunities while protecting the valley's unique ecosystem for generations to come.

- The final section (Section 7) will summarize the key findings and recommendations for institutions and stakeholders involved in the management and development of ecotourism in the Vjosa Valley. The objective is to ensure that this sector contributes to the sustainable economic development of the area while preserving the environment.

6.1.1.3 Methodology

This technical report is structured around two core standpoints: firstly, the analysis of the national and regional tourism context; and secondly, insights drawn from the 'Vjosa Wild River National Park + Valley Tourism Master Plan', which forms an integral part of the recently approved Integrated Management Plan for the VWRNP. The report commences with an exhaustive examination of the broader tourism sector in Albania, with a specific focus on the formation of "tourism regions." This concept, which is enshrined in recent national policies, is of pivotal importance for the structuring and promotion of tourism in Albania.

It is noteworthy that the recently enacted Law on Protected Areas permits the construction of 5-star hotels within certain protected regions. This presents a complex interplay between the dual objectives of fostering high-end tourism and maintaining ecological balance. This analysis examines the implications of such legislative developments, with a particular focus on their potential influence on tourism patterns and investments, particularly in ecologically sensitive areas such as the Vjosa Valley.

Furthermore, the analysis assesses the potential consequences of these developments on the distinctive landscape of the Vjosa Valley, where any transition towards mass tourism must be considered alongside the necessity of preserving its natural and cultural heritage. By examining these dynamics, the report contextualises how Albania's evolving tourism framework could impact the Vjosa region and its communities.

Furthermore, the report synthesises the findings of the standalone study, entitled 'Tourism Management Plan for the Vjosa Wild River National Park and Valley', which provides critical insights into the opportunities and limitations of tourism development in the region. This plan, which is consistent with the overarching Integrated Management Plan for the VWRNP, delineates a clear distinction between the tourism development permitted within the National Park, where activities are highly restricted, and the wider Vjosa Valley, where more expansive tourism opportunities exist.

To achieve this, the methodology incorporated several different approaches. A preliminary bibliographic review of existing studies on tourism and ecotourism was conducted, with a particular focus on the identification of sustainable practices that apply to the Vjosa Valley. A review of the legal frameworks, by-laws, and international reports was conducted to assess their implications for tourism and environmental conservation in Albania. Particular attention was paid to the correlation between Albania's tourism policies and the preservation of its natural heritage.

Statistical data from official sources were subjected to analysis to evaluate the potential of the ecotourism sector as a driver of sustainable economic development.

Because of the paucity of empirical data, the study was obliged to rely exclusively on verified statistics, which revealed significant shortcomings in the reliability and availability of the data. Furthermore, the report was refined based on the reflections and feedback from stakeholders during field consultations, ensuring that it addressed practical concerns and was aligned with the region's socio-economic realities.

This methodology has facilitated a nuanced comprehension of the potential for tourism in the Vjosa Valley, underscoring the necessity for a delicate equilibrium between the advancement of sustainable tourism and the safeguarding of the region's invaluable natural and cultural riches.

6.2 Context Analysis

To properly understand tourism planning in the Vjosa Valley, a clear distinction needs to be made between the narrower area, which comprises the Vjosa River and generally only the first level of the floodplains and its three tributaries and is included within the boundaries of the Vjosa Wild River National Park, and the broader area for tourism development, including the necessary tourism infrastructure (small-scale accommodation, catering facilities, as well as most of the trails and paths for visitors), which comprises the Vjosa Valley (or Vjosa River Basin). Simply put: the development of tourism, including recreational activities, on the river is very limited due to the need of nature conservation and the preservation of the intrinsic value of the Vjosa, and tourism is therefore planned 'away from the river' towards the periphery of the Vjosa River Valley.

Ecotourism can be considered today as one of the best models for the sustainable development of a given place. It creates added economic value and increases the well-being of people less harmful to the environment. The use of natural resources for tourism purposes is experiencing rapid development in the Vjosa Valley. Currently, the most common types of ecotourism practiced in the valley are rafting, hiking, canoeing, mountaineering, thermal baths, bird watching, horse riding, and agri-tourism. Concurrently, a variety of activities of the inhabited regions of the Vjosa Valley are made available under the area's rich cultural, historical, and religious heritage. The typical Mediterranean climatic conditions in the Vjosa Valley, with rainy and mild winters and hot and dry summers, favour the diversification of nature-related tourist activities throughout the year. This has underlined the need to promote the area and its values, including natural values, cultural heritage values, and other special aspects of culinary tourism, such as eno-gastronomy.

These activities may take place in the Vjosa valley. Tourism activities will spread from the river to the edge of the valley, where voluntary associations have been created of companies operating in the field of tourism, handicrafts, agri-tourism etc. The best structured association of this type is "Pro Përmet", which operates in Përmet and Këlcyra municipalities.

Projections indicate that over the 10-year period spanning 2025 to 2034 the income generated from activities within the Vjosa valley will increase by 400%. This is set to commence with an estimated income of approximately €850,000 in 2025, rising to an estimated €3,400,000 by 2034.

It is anticipated that the year 2027 will yield net profits, with an estimated value of approximately 1,000,000 euros by 2034.

Table 15: **Activities Income Projection in Euros (2025 – 2034)**

Source: AKZM (2024)

Revenue	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Interpretation & Visitor Experience	250500	275550	303105	333416	366757	403333	443776	488154	536969	590566
Map and Brochures sales	12500	13750	15125	16638	18301	20131	22145	24359	26795	29474
Donation boxes &online donations	10000	11000	12100	13310	14641	16105	17718	19487	21436	23579
Guided tours	12000	13200	14520	15972	17569	19328	21259	23385	25723	28295
Visitor center ticket sales	180000	198000	21780	239580	263538	289892	318881	350769	385846	424431
Restaurant/ café sales	30000	33000	36300	39930	43923	48315	53147	58462	64308	70738
Education programs	6000	6600	7280	7986	8785	9663	10629	11692	12882	14148
Total Revenues	837166	1129826	1442879	1731450	1898223	2414175	2548761	2879493	3022793	3374661

Table 16: **Activities Costs' Projection (2025 – 2034)**

Source: AKZM (2024)

Cost	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Management	567166	434988	413338	465612	535933	519716	775887	665752	673527	770079
Governance (VWRNP Foundation)	132400	133972	135574	137207	139073	140772	142505	144274	146080	147924
Interpretation & Visitor Experience	333500	2449250	280800	286416	292144	297987	303947	310026	316226	322551
Tourism	649462	884872	222200	289000	322325	520464	527596	644908	653467	772347
Total Costs	1682528	3903082	1051912	1178235	1289475	1478938	1749935	1764959	1789300	2012901

The scenarios related to the management and development of tourism within the Vjosa valley, including the Vjosa Wild River National Park begin with government and foreign investments (donors or foreign investors) to establish a foundation for activities based on ecotourism, which will be managed by the Albanian government. In the subsequent phase, private businesses and local investors will also participate, enhancing the tourist offerings while maintaining a commitment to sustainable and ecologically responsible tourism (AKZM, 2024).The growing trend of these activities is a positive step forward to the economic growth of the Vjosa valley, but it faces the following obstacles and challenges: although the demand for tourism activities classified as ecotourism or agri - tourism is increased, there are still deficiencies in recognizing the natural potentials and making them available for sustainable tourism.

The tradition of classical "economic development" establishes a proportional relationship between "economic benefits and environmental damage", which means that in the free-market economy there is generally a belief that "environmental damage is an inevitable consequence of economic development". This mentality is the main risk to sustainable development in the Vjosa Valley as well and it can be overcome through environmental education and by promoting economic activities that create economic benefits.

This would lead to sustainable development, either for the current local community or for future generations thanks to the creation of complementary activities related to tourism. Likewise, Albania in general, the rural population exodus is strongly expressing in the Vjosa valley as well. The vicinity with EU Member state Greece has maximised this phenomenon over the last 30 years.

This situation puts at risk the implementation of any development strategy for the area due to loss of human resources. Under a global world, maintaining the authenticity of local food, plant and animal products, which is the main guarantee for maintaining the quality flag of local gastronomy as an essential attraction for ecotourism and agri - tourism, is a particular challenge. This challenge may be even stronger considering the potential restrictions from establishing the VWRNP. The lack of ability to create networks of ecotourism and agri - tourism stakeholders is an obstacle to the development of these activities and to the economic, social and environmental sustainability.

6.3 Policies and Legal Framework

6.3.1 National legal framework

The legal basis in Albania consists of Law no. 93/2015 "On Tourism", as amended. In addition, within the framework of the National Strategy for Development and Integration (SKZHI), the Republic of Albania has approved a sectoral strategy named "National Strategy for the Sustainable Development of Tourism (NSSDT) 2019 - 2023".

Institutions Responsible for Tourism Policies

Ministry of Tourism and Environment

Tourism Advisory Committee for the Private Sector

National Tourism Agency

National Coastal Agency

The tourism sector inspectorate

Local government units (municipalities)

Standardization commission of tourism activities

Legal Framework

Law no. 93/2015 "On Tourism", as amended

CoM Decision No 155, 13.03.2023, "for declaring the natural ecosystem of the river Vjosa a national park, category II"

Com Decision No. 22, 12.01.2018, "the approved criteria and procedures for the certification of agrotourism activities and the construction of structures.objects that serve agrouturism"

Strategy Framework

National Strategy for Development and Integration 2030

National Strategy for the Sustainable Development of Tourism (NSSDT) 2019 - 2023

National Strategy on Biodiversity Protection 2012-2020

Figure 38: **National Strategy for the Sustainable Development of Tourism**

Source: AKZM (2024)

The strategy defined by the NSSDT is the basis for the action plans for the development of ecotourism and agrotourism, and there is even a legal basis for the latter, from Council of Ministers Decision No. 22, 12.01.2018. This strategy contains *"the approved criteria and procedures for the certification of agrotourism activities and the construction of structures/objects that serve agrotourism"*. The action plans contained in the aforementioned strategy provide the methodological and administrative basis for the development of agrotourism as one of the most promising forms of sustainable tourism.

This is also due to the possibility of directly involving farmers in this type of activity, which guarantees a capillary increase in revenues while connecting communities with the territory.

The NSSDT has classified the "Vjosa-Zagoria area", i.e. the 441 km^2 area between the sanctuary of Këlcyra and the Greek border, as *"a priority area for tourism development"*. The recent legislative amendments (specifically, Law no. 81/2017 "On Protected Areas", as amended by Law no. 21/2024, effective 22/02/2024) have the potential to compromise the protective approach of protected areas.

This is because investments aimed at more intensive development of tourism in the protected areas in question may now be permitted. Under the vision of *"Albania, a welcoming, attractive and authentic tourist destination, for sustainable development of the country's economic, natural and social potential"*, the strategy identifies three groups of tourism types, namely "coastal tourism", "nature tourism" and "thematic tourism". "Ecotourism" is considered as one of the three tourism types of the "natural" sub-sector. The "development of the nature tourism program and the creation of new products" is known as one of the specific objectives of the strategy.

With reference to the legislative base, the Ministry of Tourism and the Environment is the principal public body responsible for the definition and implementation of tourism policies in Albania. Other responsible bodies in the field of tourism, related with the Ministry of Tourism and the Environment, are:

- Tourism Advisory Committee for the Private Sector
- National Tourism Agency
- National Coastal Agency
- The tourism sector inspectorate
- Local government units (municipalities)
- Standardization commission of tourism activities.

Nature tourism refers to travel activities that revolve around experiencing and enjoying natural environments. The goal is often to immerse oneself in scenic landscapes, wildlife, and outdoor recreation. Examples include hiking in national parks, bird watching, or sightseeing in natural areas.

Ecotourism, on the other hand, is a more sustainable approach to traveling in natural areas, often guided by principles of conservation, community involvement, and education. It's designed to minimize environmental impacts while providing positive contributions to local communities and ecosystems.

6.3.2 European Tourism Policy

The current European tourism policy is based on the European Agenda for Tourism 2030, adopted at the end of 2022, which aims to make tourism greener, more digital, and more sustainable.

In the agenda, the EU Council developed its vision for the future, while reminding that before the COVID-19 pandemic, the EU tourism ecosystem represented 15.8 % of employment and that over 99 % of the economic actors of this ecosystem are micro, small, and medium-sized enterprises. The agenda comes with five priorities:

- Enabling policy framework and governance;
- Green transition;
- Digital transition;
- Resilience and inclusion;
- Skills and support for transition.

The European Agenda for Tourism 2030 describes voluntary concrete actions for the Member States, relevant public authorities, the Commission, and other stakeholders in the tourism ecosystem to take and encourage, in accordance with the principle of subsidiarity and within the remit of their competences.

6.4 GAP analysis

6.4.1 Current situation and challenges

6.4.1.1 *Vjosa Basin*

The Vjosa Valley is situated across three counties (Fier, Vlora and Gjirokastra) and 13 municipalities: Libohova, Përmeti, Këlcyë, Gjirokastra, Tepelena, Memaliaj, Mallakastër, Fier, Vlora, Selenica, Himara, Kolonja and Dropulli.

The Vjosa Valley population benefits from a variety of ecosystems provided by the Vjosa basin. This basin is one of Europe's last large free-flowing river systems, making it an attractive destination for natural tourism. Additionally, the basin contains two UNESCO World Heritage sites with significant cultural value (Berat, Gjirokastra), two national parks, several protected areas, and a diverse range of cultural, historical, and archaeological sites.

On March 13th, 2023, the Vjosa River was declared a national park, according to IUCN category II. The park includes over 400 km of free-flowing river, riverbanks, and land surface of the 12,727-ha. Despite the Vjosa, the park includes its 3 branches, Drinos, Bënça, and Shushica rivers, totalling (Figure 38). This makes it the unique, wild river focused national park in Europe.

The proclamation of the Vjosa River as a national park represents a historical and significant moment for nature conservation in Albania and beyond. It provides greater protection for the ecosystems and the cultural, historical, and archaeological heritage. Additionally, it presents an opportunity and challenge for sustainable tourism development that respects the environment and all the assets within the Vjosa basin.

Figure 39: **Vjosa Wild River National Park**

The Vjosa River and its tributaries is home to over 15 types of priority river habitats of European interest, as defined by the Habitat Directive - NATURA 2000 (EU Directive – Natura 2000). Additionally, there are 7 priority habitat types (EUNIS, IPA) with high floristic values. The river and its branches serve as biological corridors for many aquatic creatures, including fish, amphibians, reptiles, and aquatic invertebrates, effectively acting as a living artery between the sea and the land.

Despite unique natural and cultural values, the Vjosa basin's great wealth has been consistently damaged by human activity, which continues to persist. Furthermore, climate change has started to impact river flows and disrupt natural balance due to rising temperatures. Historically, pollution of water and the environment surrounding riverbanks has been the primary issue affecting Albanian rivers, including the Vjosa River, in terms of human activity; the presence of microorganisms above the rates permitted by European standards, identified as total coliforms and heterotrophic bacteria, indicates that human activity is the primary source of pollution in the Vjosa River. (Hamzaraj et al., 2014).

As previously stated, the amendment to the legislation pertaining to protected areas, which allows construction of the 5-stars hotels and related infrastructure even in the core zones of the national parks, has created a potential for deterioration of the situation as a result of the risk posed by the activities of public and private actors. Threats to the Vjosa River include solid waste disposal, sewage discharge, discharge of polluted water from aquaculture activities, as well as for the operation of inert material collection points (gravel extraction, bitumen production, extraction of water for irrigation and water bottling etc).

There are also several other businesses such as production of paints, slaughterhouses, or shoe production which dispose of their wastewater into the Drino River (tributary of Vjosa River) without filtering. Their cumulative effect constitutes a threat to the quality of water resources and the organisms living in them.
Considering the characteristics outlined, the main challenge for ecotourism remains sustainability, implying human management and exploitation activities (as indicated below) as the main determining factor in the ecotourism development and / or ecosystem deterioration.

6.4.1.2 *Physical and digital Infrastructure*

The roads outside the main corridor along the Vjosa River, which connect the main residential areas, are in poor condition. Although the Albanian Government and international organizations have intervened to improve the quality of the existing roads, the situation of the physical infrastructure remains a serious problem. The development plans of the municipalities located along the Vjosa basin, particularly in the upper and middle reaches, reveal significant deficiencies in road connectivity between residential centres. It is important to note that the status of the National Park inside the Vjosa basin necessitates that any infrastructural development and tourist flow must not have negative impacts on the river ecosystem. Despite the current situation, both physical and digital infrastructure require significant improvement in the medium term.

The physical infrastructure of the Vjosa Basin varies along its extent. In the lower flow, both the main branch and other branches have more developed road infrastructure. However, this is not the case in the middle and upper parts of the basin. The ease of accessibility of connections between main municipalities is not necessarily indicative of the same ease of accessibility of infrastructural connections between main municipalities and their administrative units (villages).

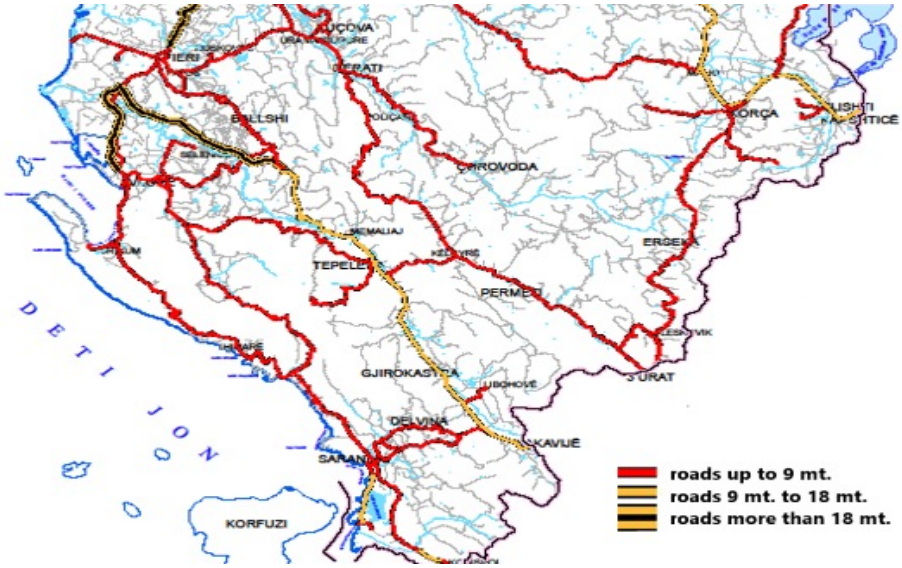

Figure 40: **Roads Network in Vjosa Basin (Albanian Road Authority)**

If planned with conservation standards in mind, the road and bridge construction can promote eco-tourism by providing access to areas that can be developed in a sustainable way. However, this is not the case with the planned Airport of Vlora, which is expected to be completed in 2025 and whose construction has not been planned with environmental considerations in mind. The airport of Vlora along with the roads and auxiliary infrastructure, which facilitates the connection between countries and the development of classical tourism, would have a negative impact on the declared Protected Landscape Vjose – Narte but also to the adjacent VWRNP.

While roads and bridges can pose significant threats to ecosystems, careful planning and innovative design can mitigate these impacts and even contribute positively to environmental conservation. The key lies in integrating ecological principles into transportation planning, promoting sustainable infrastructure development that balances human mobility with the preservation of natural habitats and biodiversity.

Digital infrastructure is a crucial asset for territorial development, particularly in tourist areas that require access to high-quality connectivity and digital services. Therefore, the Vjosa basin, which hosts a national park with a focus on ecotourism development, should also be equipped with quality digital connectivity in both urban and rural areas. While urban areas may have satisfactory connectivity, the same cannot be said for rural areas, where connectivity is either absent or of very poor quality.

From the data available, fixed broadband coverage for both population and family, as given in the figure below, in the 2013-2020 periods has increased more than twofold. Fixed broadband penetration remains well below the EU average and other penetration levels of neighbouring countries, albeit growing by 10%-15% annually.

Population Coverage indicates the percentage of the total population with access to fixed broadband services. It reflects how many individuals live in areas where fixed broadband is available. Population Coverage is often higher than Household Coverage in regions where multiple individuals share a single broadband connection or where there is significant access to public internet services (e.g., schools, libraries). Family (Household) Coverage indicates the percentage of households subscribing to fixed broadband services. It reflects how many families can access broadband at home. The data indicate that in this specific case, regional coverage is very low both in absolute value and in relation to family coverage.

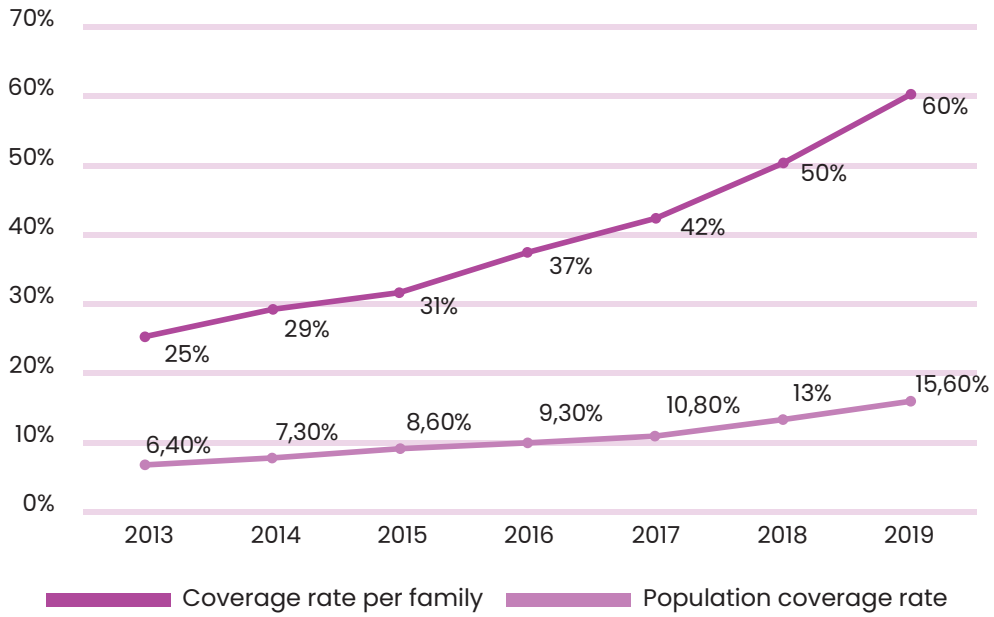

Figure 41: **Quality services of digital infrastructure**

Source: Min. of Infrastructure and Energy, 2020

Territorial coverage is significantly lower for 4G at 21% and 55.6% by the operator. Most of the 4G coverage is concentrated in urban areas. According to the quality of services conducted by AKEP during 2019, mobile operators are taking measures to extend 4G coverage in rural areas, focusing mainly on those areas where 3G coverage has not been very good.

6.4.1.3 *Institutional organization (central and local level)*

The ecotourism principles call for the establishment of a well-defined institutional framework that clearly outlines and divides responsibilities and roles for the design and implementation of operational and regulatory activities, while promoting coordination between the relevant authorities.

In the context of local governance, the municipal authorities bear the sole responsibility for the organisation and development of tourism. Prior to the most recent legislative amendments of 2024, the organisational and managerial structure of tourism at the local level was constituted by territorial branches of tourism development. Given the ambiguity of their role and the potential for conflict of interest with other organisations with responsibility for tourism, currently at the local level only municipalities operate as the responsible authority for the field of tourism. In accordance with the stipulations of the legislation, local government units are obliged to fulfil the following duties and responsibilities:

1. The creation of an inventory of the main tourism resources of the local government unit and an inventory of tourism enterprises at the local level;
2. The submission of the inventories mentioned in point a) of this article to the minister responsible for tourism on a periodic basis (every six months), for the creation of a database at the national level;
3. The provision of supporting infrastructure for tourism business activities at the local level, enabling tourism enterprises to comply with standards;
4. The contribution to the development of various types of tourism at the local level, such as cultural tourism, agrotourism, etc. Furthermore, in addition, local government units are expected to play an active role in the diversification of the tourism product, in cooperation with all central and local institutions, as well as interest groups. They are required to provide information, as part of the tourism statistics system, to the minister responsible for tourism and to collaborate in the implementation of measures aimed at ensuring the provision of primary healthcare services for visitors and tourists within the jurisdiction of the local government unit, in accordance with the standards set forth by the Ministry of Tourism and the Ministry of Health.

From an institutional standpoint, the entity in question confronts a series of challenges that are closely intertwined with a dearth of coordination and planning. The competitiveness of the sector is weakened by the lack of well-defined rules and regulations of tourism activities, the absence of any form of classification, licensing, certification, and monitoring system enabling higher standards and quality in the sector, and unfair competition due to high level of informality. Considering the multidisciplinary relevance on ecotourism, effective cross-sectoral coordination is essential. This is particularly important for policies related to water and the environment, health, energy, agriculture, industry, spatial planning, and land use. It requires multi-level cooperation between interest groups and greater cross-border collaboration between countries on the use of ecotourism resources.

6.4.1.4 *Record and register of tourist accommodation structures*

The recording and registration of accommodation structures is a priority set by the European Union's Agenda 2030. This priority aims to formalise the tourism market and, secondly, to develop appropriate statistical analyses with databases that correspond to reality. This is not an easy challenge, as the housing structures in the Vjosa basin in general, and in the villages of the Vjosa basin in particular, have a relatively high degree of informality.

In this regard, the Albanian government has amended the Law on Tourism to register accommodation structures classified and certified by a third party (as in Albania, accommodation structures were self-classified). Self-classification is now a criminal offence punishable by fines up to the suspension of tourist activity. While the registration of accommodation structures may increase formality, the government's attempt to develop tourism with formalized 'five-star' accommodations near or in protected areas does not align with the necessary characteristics and protection that should be afforded. Experts warn that this poses a significant risk to the Albanian nature and its sustainability.

6.4.1.5 *Human resources skills*

This issue relates to the need to familiarise the actors involved in the transition to a green, digital and inclusive vision of tourism, and to support the information and training of human resources involved in SMEs. Such an issue represents a major challenge, as almost all tourism stakeholders, public and private, are uninformed and unprepared for the necessary changes in the conception and management of natural resources, the comprehensive vision of tourism and the digitalisation processes required for the development of sustainable ecotourism activities. This information and skills lack is observed not only in direct providers of tourist services, in supporting agencies (tourist guides, tourist promoters), but also in local, public, and private institutions.

6.4.2 Ecotourism theories

Ecotourism is growing in popularity as people become more conscious of the ecological environment, yet it still poses issues and challenges for the environment's sustainable growth (Buckley, 2021; Newsome & Perera, 2023; Mbaiwa & Stronza, 2009). In order to address these obstacles, a study of the ecotourism literature is required in order to identify the main research questions and future lines of inquiry. Ecotourism study is a broad, multidisciplinary area that crosses several academic fields (Carreira & Amaral, 2017). The concept of ecotourism is centred on the interaction between humans and nature, emphasizing experiences that foster respect, education, and conservation (Buckley, 2009; Fennell, 2004). Ecotourism theory holds that through immersive experiences in natural environments, individuals develop a deeper connection with ecosystems and become more inclined to support environmental protection efforts.

In this context, the development of ecotourism in Vjosa Wild River National Park is also worthy of consideration. Recent theoretical and empirical studies indicate that the development of ecotourism should proceed from the concept of community-based tourism.

Community-based tourism (CBT) is a sustainable tourism model that is developed, managed, and operated by local communities, often in rural or culturally rich areas. The concept places emphasis on the empowerment of communities to assume a leading role in the development of tourism, while simultaneously promoting the preservation of culture, the sustainability of the environment, and the distribution of economic benefits in a manner that is equitable. The principal elements of CBT are as follows:

1. **Community Ownership**: Local people are actively involved in the decision-making, planning, and management of tourism activities. Furthermore, the cultural and environmental preservation of the area is of paramount importance. The tourism experience serves to highlight the unique traditions, heritage, and natural resources of the community in a manner that does not exploit or degrade them.

2. **Economic Benefits**: Revenue generated from tourism is distributed within the community, thereby contributing to improved livelihoods and local development.

3. **Sustainability**: The objective of CBT is to minimise any negative impact on the environment and culture while simultaneously fostering long-term social and economic stability.

In essence, CBT facilitates meaningful connections between visitors and the community, while ensuring the community's well-being and resilience.

While the concept of CBT appears initially attractive and promising, its practical implementation is subject to various challenges that may negate the advantages of the CBT project. The implementation of the CBT project is not without its challenges.

These include:

1. discrepancies between the expectations of tourists and the needs of the communities in which they visit;
2. competition between local communities for the use of natural resources;
3. reliance on seasonal tourism for a significant proportion of the local population's income;
4. the legal status of communities as either managers or simply as a workforce in the territory;
5. the necessity for local communities to form partnerships in order to reduce their dependency on more powerful external partners.

It is imperative to enhance the capacity and quality of local communities in order to enhance tourist satisfaction and to facilitate the absorption of the positive impact of tourism activities. In order to optimise the positive impact of community-based tourism, it is essential to enhance coordination and interaction between local communities and other relevant parties. This should be done in order to ensure that community-based tourism is regarded as a highly strategic concept in the context of tourism development. In light of the distinctive features of the Vjosa Wild River National Park, it can be posited that this ecosystem presents a singular opportunity to integrate community-based tourism (CBT) principles.

The park's status as the last remaining free-flowing river in Europe, along with its rich biodiversity, makes it an optimal location for CBT initiatives that integrate conservation with local economic and cultural development (Planeterra, 2023).

As we anticipate the future of tourism, we need to be true to the sustainable development principles and prioritize cultural acceptability, environmental compatibility, and economic stability. It is imperative that the travel and tourism industry adopt a proactive approach to risk management, adaptation, resilience, and decarbonisation. Doing so will enable the industry to navigate the evolving competitive landscape and build a groundwork for future competitiveness and relevance. (CREST, 2020). Furthermore, as evidenced by the research and development of ecotourism, the exploration of sustainable development is increasingly reliant on research methods drawn from a range of disciplines to inform the formulation of policy. It is imperative to establish a methodology for evaluating the economic value of ecotourism and quantifying it in a reasonable and scientific manner, as this is a fundamental challenge in the advancement of ecotourism.

6.4.3 Questionnaire results

A questionnaire campaign was conducted for the Vjosa River National Park with the objective of gathering valuable insights from a variety of stakeholders (public and private). The campaign was designed to serve multiple purposes, including the identification of ecological issues, the understanding of the social and economic impact of the park, the evaluation of tourism and infrastructure needs, and the exploration of the effectiveness of existing policies.

In consideration of the data obtained from the questionnaire, it can be concluded that the most sensitive issues pertaining to the development of tourism in the Vjosa Valley are those of water pollution, infrastructure deficiencies, the inefficiency of public administration, and the promotion of ecotourism.

In response to queries regarding the most significant threats to the quality of Vjosa's water, the local community identified pollution from urban waste and sewage as a primary concern. Agriculture (28%), weak water supply network (16%), erosion or deforestation (10%) or tourism are encountered as problems, but over 43% of those interviewed think that urban waste and sewage are the main problem of the water quality of the river Vjosa.

When queried about the challenges encountered by the tourism industry in the Vjosa Valley, the respondents identified the dearth of an efficient road network as a primary impediment to the integration of foreign and domestic tourists.

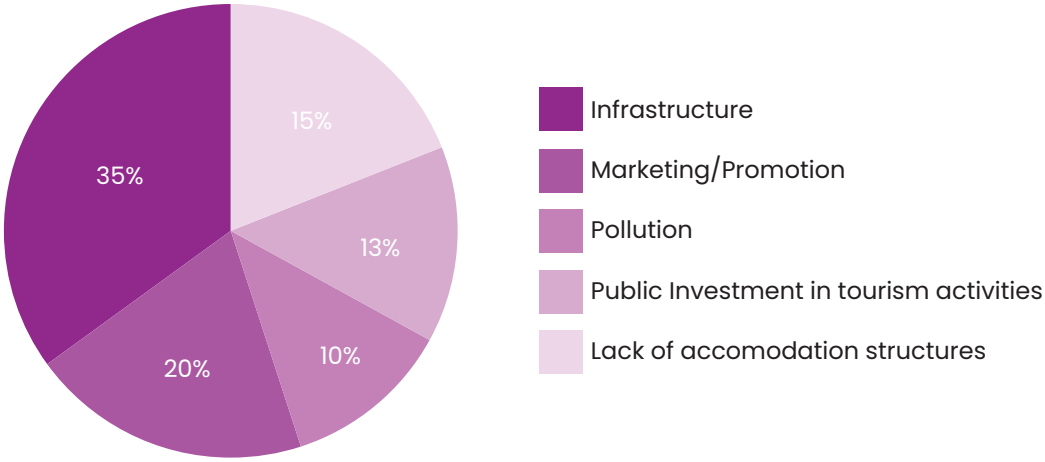

Figure 42: **The tourism challenges in Vjosa Valley**

Inquiries into the efficacy of managerial practices among select public entities responsible for water management have yielded a mixed response from the community. While a slight majority (39%) perceive these entities to be operating at an average level of efficiency, a notable proportion (53%) view their performance as below average. At the same time, the community is looking to public administration as a necessary solution to two major problems: the flooding of the Vjosa and the management of natural resources as a whole (water, forests, economic exploitation, etc.).

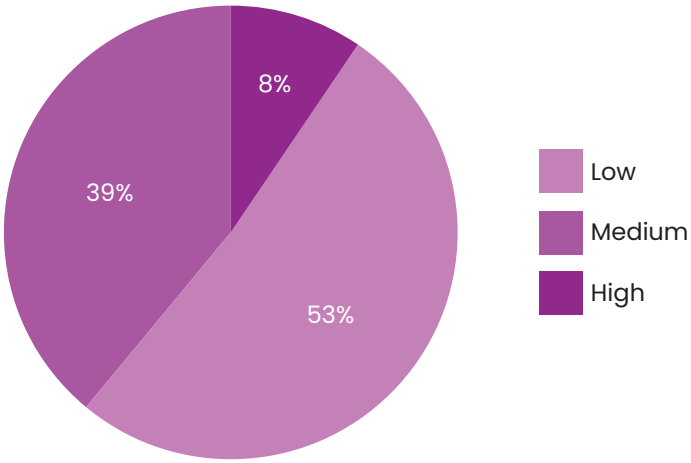

Figure 43: **Public Entities Efficiency about Vjosa Valley**

In response to queries regarding the requirements of the Vjosa Valley for the advancement of ecotourism, the interviewees posited the necessity for the cultivation of the existing human capital to advance the territorial brand, considering that the majority of respondents (over 50%) perceive the challenges associated with tourism development in the Vjosa Valley to be rooted in the inadequate management of natural resources by both public and private entities. Furthermore, the interviewed panellists advocate the use of a multitude of information channels, including television, face-to-face interactions, and educational events, to disseminate messages on responsible, ecological, and sustainable tourism practices.

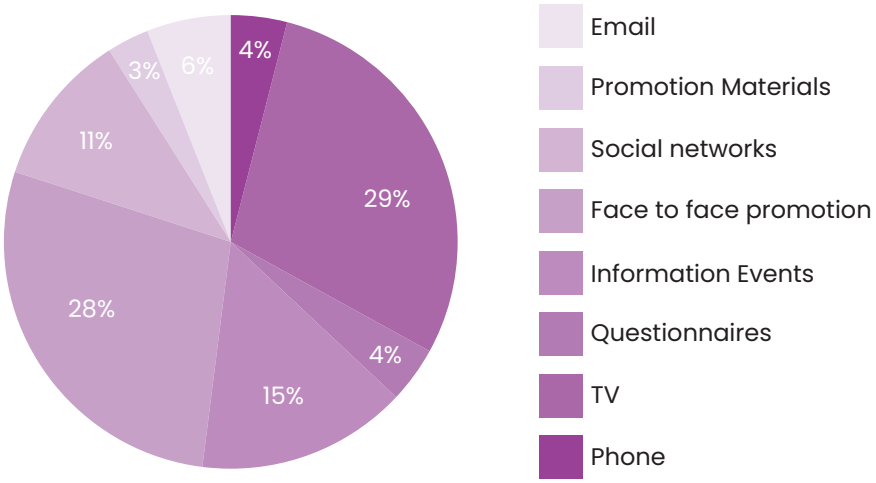

Figure 44: **Information Channels Vjosa Valley's Promotion and Information**

6.5 Shared Vision and Guiding Principles for Development of Tourism in the Vjosa Valley

Uniting the Vjosa River Valley under a single plan that provides guidance for development of the tourism in the wider Vjosa valley and emphasizes very strictly controlled and limited tourism activities in the minor part of the Vjosa Wild River National Park requires a shared vision and set of guiding principles for the development of tourism in the region, which are presented in the Vjosa Wild River National Park + Valley. Tourism Master Plan which defines also the vision for tourism in the wider Vjosa valley landscape: "The vision for tourism in the Vjosa Valley is to become a globally recognized model for sustainable tourism, through innovative management of the VRWNP as well as sustainable tourism development that protects nature and improves the lives of communities in the valley".

The guiding principles necessary for laying an effective foundation for the park are listed below and include the following recommendations:

- Align with protected area objectives and policy document for biodiversity preservation to ensure biodiversity conservation is the number one priority.
- Encourage the establishment of destination management and marketing organization (DMMO) to embed sustainable tourism to develop and flourish, aligning with the National Sustainable Tourism Strategy.
- Align tourism development activities with global sustainable tourism criteria and SDG goals
- Promote responsible business models that wherever possible engage and benefit local people, reduce impact on natural assets and deliver conservation benefits
- Use baseline data and a monitoring program to assess and minimize negative impacts on nature, culture and host communities.
- Forge partnerships that help to protect and enhance the valley's natural, cultural and economic assets.

The strategic direction of the Tourism Master Plan for the Vjosa valley, including the VWRNP, focuses on sustainable tourism that supports the protection of the Vjosa Wild River National Park while stimulating local economic development through tourism. The target markets align with the above, but focus on markets that are high-value, low impact travellers, seeking unique natural and cultural experiences that are sustainable and provide local benefits.

The unique wild and scenic nature of the park and valley are increasingly of interest to visitors who want to share in the serenity of the park and the people and culture that surrounds it.

Local communities also want to share their region with others and in doing so help to enhance their local employment and economic benefits, fund the protection of the park and celebrate local cultures.

However, as with inviting anyone into one's home, the community ask visitors to follow five simple tenants:

- Respect hosts and the cultural practices of the region;
- Bring the baggage that holds your clothes, and leave all other types of baggage at home;
- Protect the natural environment of the valley, leaving only footprints and taking only photo as well as of course, some local souvenirs;
- Enjoy the unique, scenic, tranquil and adventurous landscape and help make sure your children can return to do the same;
- Respect other visitors to the landscape so that they can enjoy it as much as you.

These are the tenants that visitors are asked to adhere to when visiting the Vjosa Valley, and also the guiding principles for tourism development in the valley, with a focus on establishing high quality, high value, low impact tourism. The type of visitors the valley seeks to attract are therefore those that seek out sustainable, nature-based tourism experiences where they can engage with local people in meaningful ways that benefit both visitor and host, while protecting the environment of the valley.

This market is therefore the focus of the Tourism Master Plan recommendations which are divided into three 'Pillars' (Financial, Human Capital and Governance & Policy), all of which support Sustainability as the core foundation for tourism in the landscape.

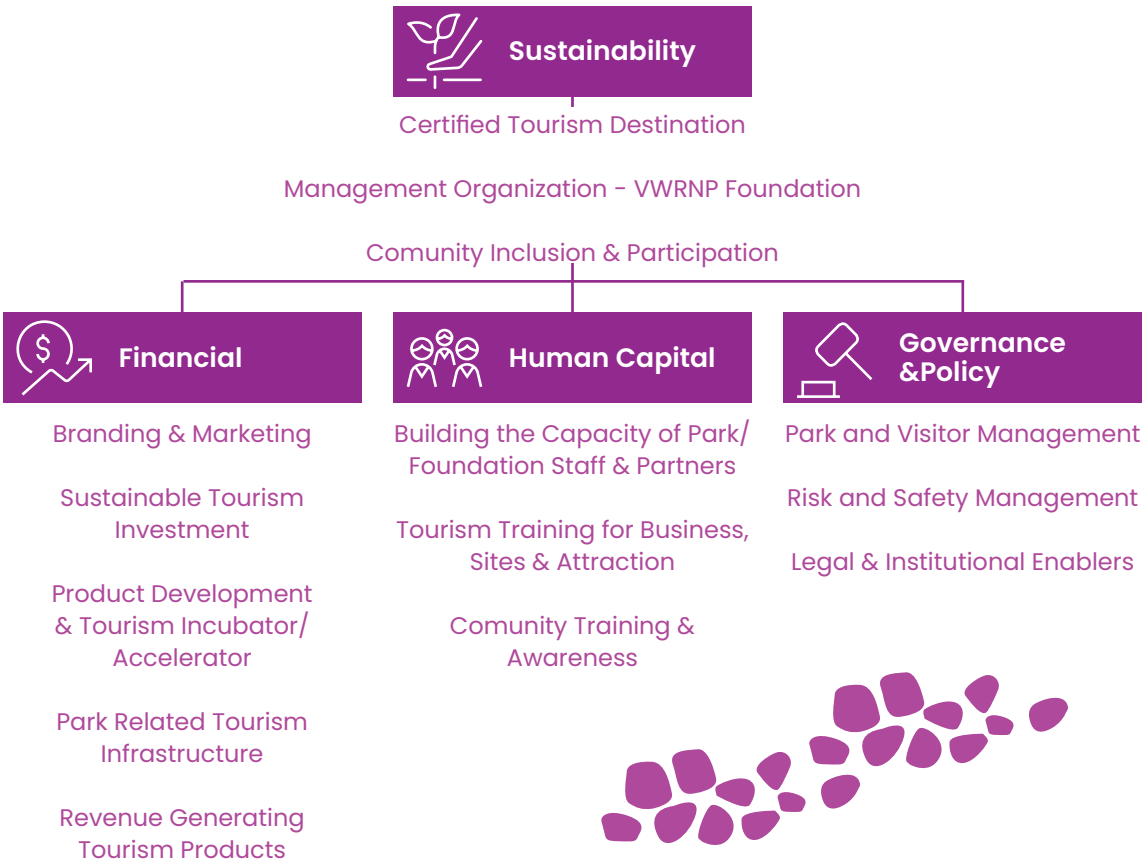

Figure 45: **Sustainability scheme**

6.6 Management response to address the identified problematics

Possible issue 1

Institutional organization (central and local level)

Management Response to Address the Issue

Establishment of clear communication channels between central and local institutions. This can include regular meetings, electronic communication platforms, and designated liaison officers to facilitate information flow.

Joint Task Forces and Committees comprising representatives from both central and local institutions to address specific issues or projects. These platforms can facilitate coordination and decision-making.

Alignment of Policies and Priorities between central and local levels to avoid conflicts and promote synergy in implementation efforts.

Legal Framework and Support that clarifies the roles and responsibilities of central and local institutions in coordinating activities. Legal provisions can help enforce collaboration and accountability.

Possible issue 2

Digital infrastructure

Management Response to Address the Issue

Internet Connectivity:
Establishing reliable internet connectivity is fundamental. This can be achieved through various means such as satellite internet, wireless broadband, fibre optics, or even innovative solutions like mesh networks. Governments, NGOs, and private sector entities can collaborate to fund and implement connectivity projects.

Infrastructure Investment:
The government should prioritize investing in digital infrastructure in remote areas, including building and upgrading telecommunications networks, establishing data centers, and deploying necessary hardware such as towers and cables.

Policy and Regulation:
Implementing favourable policies and regulations can incentivize private sector investments in remote areas. This may include subsidies, tax breaks, or regulatory frameworks that encourage competition and innovation in the telecommunications sector.

Possible issue 3

Road infrastructure

Management Response to Address the Issue

Environmental Considerations:
Consider environmental factors during the planning and construction phases. This includes minimizing deforestation, mitigating soil erosion, and preserving wildlife habitats.

Budget Allocation:
Allocate sufficient funds for road infrastructure development in rural areas. This could come from government budgets, international aid, or public-private partnerships.

Maintenance:
Implement a regular maintenance schedule to ensure that roads remain in good condition over time. This includes repairing potholes, clearing debris, and ensuring proper drainage.

Possible issue 4

Vjosa River pollution

Management Response to Address the Issue

Waste Water, Waste, and Sewage Management:
To clean residential and commercial wastewater before it is released into rivers, wastewater treatment plants must be installed and upgraded creating efficient waste management programs to stop solid waste from getting into waterways. This includes proper collection, recycling, and disposal of waste, as well as promoting public awareness about littering. Urban sewage systems should be upgraded to stop raw sewage from entering rivers. This can involve separating stormwater from sewage, repairing leaky pipes, and expanding sewage treatment infrastructure.

Industrial Regulations:
Enforcing strict regulations on industries to control and treat their effluents before releasing them into rivers. This can involve implementing pollution control measures, such as installing effluent treatment plants and regularly monitoring discharge.

Agricultural Practices:
Promoting sustainable agricultural practices to reduce runoff of fertilizers and pesticides into rivers. This can include encouraging organic farming, precision agriculture, and implementing buffer zones along water bodies.

Riparian Zone Protection:
Protecting and restoring riparian zones (the areas adjacent to rivers) to prevent erosion, filter pollutants, and provide habitat for wildlife. This can involve reforestation, establishing vegetative buffers, and implementing erosion control measures.

Public Awareness and Education:
Educating the public about the importance of clean rivers and their role in protecting them. This can involve campaigns on water conservation, pollution prevention, and responsible recreational activities.

Monitoring and Enforcement:
Implementing robust monitoring programs to regularly assess water quality and identify sources of pollution. Strong enforcement of environmental regulations is essential to ensure compliance and deter illegal dumping.

International Cooperation:
Collaborating with Greece on transboundary rivers to address shared pollution issues. This can involve bilateral or multilateral agreements, sharing of data and technology, and coordinated efforts to mitigate pollution.

Possible issue 5

Indiscriminate exploitation of natural resources

Management Response to Address the Issue

Regulatory Frameworks:
Albanian Government need to enact and enforce strict regulations on the extraction and use of natural resources. This includes laws regarding mining, logging, fishing, and other resource-intensive industries. Regulations should aim to prevent overexploitation, habitat destruction, and pollution.

Sustainable Management:
Implementing sustainable management practices in industries such as forestry, agriculture, and fisheries is crucial. This involves techniques like selective logging, rotational grazing, and quota-based fishing to ensure that resources are harvested at a rate that allows for natural regeneration.

Economic Incentives:
The Albanian Government can provide economic incentives for businesses and individuals to adopt sustainable practices. This can include tax breaks for environmentally friendly activities, subsidies for renewable energy projects, and grants for conservation initiatives.

Possible issue 6

Registration of structures providing tourist services

Management Response to Address the Issue

Outreach Programs:
Local administrations often conduct outreach programs to educate accommodation providers about registration requirements and procedures. These programs may include workshops, seminars, or informational sessions where officials provide guidance on legal obligations and benefits of registration.

Registration Requirements:
Establishing clear registration requirements for accommodation structures is crucial. This might include documentation such as proof of ownership or lease, compliance with safety regulations, and payment of applicable fees.

Incentives:
Some local administrations offer incentives to encourage accommodation providers to register their properties. These incentives could include tax breaks, access to marketing support, or priority listing on official tourism platforms.

Enforcement and Compliance Checks:
Regular inspections and compliance checks help ensure that registered accommodation structures meet safety and quality standards. Inspectors may visit properties to verify compliance with regulations and address any violations.

Penalties for Non-Compliance:
Implementing penalties for non-compliance with registration requirements can incentivize accommodation providers to register their properties. Penalties might include fines, suspension of operating licenses, or other punitive measures.

Possible issue 7

Human resources (HR) skills

Management Response to Address the Issue

Training and Education:
Provide comprehensive training to stakeholders (public and private) and accommodation structure staff members on ecotourism principles, local flora and fauna, conservation techniques, and cultural sensitivity. This education should empower stakeholders to act as ambassadors for responsible tourism practices.

Community Engagement:
Encourage stakeholders to engage with local communities in a respectful and culturally sensitive manner. HR can facilitate partnerships with local organizations, involve community members in ecotourism initiatives, and support local economic development through employment opportunities and partnerships.

Understanding of Ecotourism Principles:
HR professionals involved in ecotourism should have a strong understanding of ecotourism principles, including conservation ethics, community involvement, and sustainable practices.

Conflict Resolution and Mediation:
Develop strategies for resolving conflicts that may arise between tourists, staff, and local communities. Local professionals should be adept at mediation and conflict resolution to ensure that disputes are handled peacefully and in a manner that upholds the principles of ecotourism.

Professional Development:
Support stakeholders in their professional development by providing opportunities for training, skill-building, and career advancement within the field of ecotourism. Encourage employees to pursue certifications and qualifications related to sustainability and tourism management.

6.7 Conclusions

The Vjosa valley is a valuable ecosystem as its nature values and importance go beyond the boundaries of Albania. In addition to the natural values, the Vjosa Valley is a significant mixture of historical, archaeological, cultural, and culinary values. The most important part of the Vjosa Valley, the Vjosa River and its three tributaries, was therefore designated as the unique Vjosa Wild River National Park in 2023. The vast majority of the national park, over 90% of the water surface of the Vjosa River and its three tributaries with floodplains, is thus an area where planning and implementation of tourism and recreational activities is severely restricted due to conservation objectives. It is therefore envisaged that the development of eco-tourism should be directed towards the peripheral areas of the Vjosa valley, where there are many natural and cultural features and where the necessary tourist infrastructure, including accommodation and food and drink facilities, should also be located. Thus, this area can be utilised with respect, preserving it as a valuable asset for future generations in the concept of sustainable development.

However, throughout the political transition period in Albania, overexploitation of the natural resources of the Vjosa basin, has been noted in water pollution, deforestation, and significant damage to flora and fauna, especially in the lower part of the basin. Similarly, climate change is expected to harm the natural habitat of the river, which may reflect serious consequences to the local economy.

It is therefore necessary that all governmental, central, and local structures (but also all other interested parties) take measures to preserve the Vjosa National Park and even to take restoration actions when needed. Having the natural values in the Vjosa valley at their best condition can be the basis for the economic development of the valley, whereas the tourism could be the primary sector.

The European Union's guidelines for the future of tourism advocate the sustainable development of ecotourism. This policy is also echoed by the latest scientific research on tourism, especially after the period of the COVID19 pandemic, which should make people more aware of the importance of preserving biodiversity, purity, and nature.

The development of ecotourism in the Vjosa Valley, which is closely linked to the Vjosa River ecosystem, has been and continues to be, the subject for pressures originating from human activity. These pressures have the potential to disrupt the balance between conservation and protection of the ecosystem, whether on legal grounds (for example, the recent change in the Law on Protected Areas or the construction of the Vlora airport), or on informal ones, such as industrial and agricultural activities without the license requisite.

It is not possible to engage in ecotourism without a protected and properly managed ecosystem. As is widely acknowledged, the development of ecotourism in the Vjosa Valley is still in its infancy. To facilitate the sustainable growth of this sector, while simultaneously reducing the potential negative impact of tourism on the surrounding environment, this study proposes the following priorities and recommendations:

1 Establishment of effective organisational and coordinating structures between central and local institutions is a crucial element in the development of ecotourism. When central and local legislation aligns with ecotourism objectives, it establishes a unified framework that enables effective action, resource allocation, and enforcement. Such coordination can streamline policies around protected areas, sustainable land use, and responsible tourism practices, ensuring that development aligns with environmental conservation. However, as seen in debates on legislative amendments for protected areas, alignment often remains more rhetorical than actionable. To move beyond proclamations, central and local institutions need to establish clear roles, responsibilities, and mechanisms for collaboration. This could include joint committees, regular policy reviews, and shared data platforms, which foster accountability and consistent implementation. Through cohesive organizational structures, ecotourism efforts can become more grounded, impactful, and sustainable, directly benefiting both the environment and local communities.

2 Infrastructure development - both physical and digital - is indeed essential for fostering a sustainable relationship between people and nature. Stakeholders are increasingly emphasizing the need for projects that support tourism growth while prioritizing environmental conservation. On the physical side, building eco-friendly pathways, visitor centers, and waste management facilities can improve accessibility without compromising natural landscapes. Meanwhile, digital infrastructure, such as interactive maps, online educational resources, and digital monitoring systems, can enhance visitors' experience and awareness, encouraging responsible tourism. Digital tools can also help monitor visitor numbers, manage traffic in sensitive areas, and provide real-time data for resource management. Balancing these infrastructure developments with environmental impact reduction will require innovative, low-impact construction techniques, careful site planning, and community involvement to ensure that projects benefit both the environment and residents.

3 Environmental pollution (especially in the lower course of the Vjosa River) is a pressing issue with far-reaching implications. Beyond the direct impact on tourism, which requires intervention at both central and local government levels, the contamination affects the river's ecosystems and the health of communities relying on it. Pollution harms the appeal of the area as a tourist destination and its role as a vital ecological corridor. Addressing this issue comprehensively will likely require coordinated policy measures, improved waste management practices, and community engagement to restore and preserve the river's ecological integrity.

4 Raising awareness among the local population is indeed crucial for protecting the Vjosa River ecosystem, as it encourages sustainable practices that benefit both the environment and the community. Highlighting the natural values of the area - its biodiversity, clean water resources, and natural beauty - can foster a sense of pride and responsibility among residents. By informing the community about the positive impact of a healthy ecosystem on social well-being and public health, awareness campaigns can help people see beyond the immediate economic benefits of tourism. Leveraging diverse information channels like TV, social media, and community events can effectively reach different segments of the population, ensuring a broad and inclusive approach to education. Such efforts can create behavioural changes that not only improve environmental stewardship but also build a community culture cantered around the preservation of natural resources for future generations.

5 Establishing a comprehensive registry of accommodation structures, alongside creating extensive databases on natural resources and their evolution, would indeed be valuable for both environmental management and research. By systematically tracking accommodation sites, visitor numbers, and their impact on natural resources, authorities can better understand the relationship between tourism and environmental change. For researchers, such data would provide a clear, scientific foundation for studies on environmental impact, conservation efforts, and sustainable development. This information could also support evidence-based policy decisions, helping to mitigate environmental degradation while promoting responsible tourism.

7

Climate Changes In The Vjosa Basin

Expert: Prof. Dr. Romeo Hanxhari

Executive Summary

Climate change is occurring and is no longer just an important issue for the future but for the present. These changes have complex consequences, as they involve not only a rise in the global average temperature by 1.35°C compared to the pre-industrial period, but also a shift in the entire chain of other climatic elements, which in turn alters all other natural elements, leading to subsequent social and economic impacts associated with these changes.

The Vjosa Basin, like the entire territory of Albania, has a typical Mediterranean climate, characterized by two fundamental elements:

- a mild and wet winter, and a hot and dry summer;
- precipitation concentrated mainly in the cooler half of the year. These major climatic characteristics are not expected to change drastically. However, the main rule of climate change is that 'wet areas are becoming wetter, and dry areas are becoming drier.'

Consequently, several important features are changing and continuously worsening, making the climate of this basin more prone to extreme events and triggering chain reactions in natural ecosystems and human systems. Such negative changes in climatic elements include:

- a shift towards a generally drier climate but with more intense rainfall in the form of downpours during both winter and summer;
- increased weather extremes in both main seasons, and simultaneously, an unusual presence of events from different seasons throughout the year;
- a continuous decrease in snowfall at the higher elevations of the Basin and a reduction in the extent of the cryosphere (snow and ice) and its duration throughout the year;
- more frequent and intense heatwaves, like those experienced over the past 10 years;
- more frequent and severe cold spells than before;
- more intense and unexpected rainfall in the form of downpours in both seasons;
- more intensive droughts across the basin; etc.

These changes will lead to:

- environmental changes in the Vjosa delta, including increased sea water temperatures, a tendency towards acidification, gradual sea encroachment, and salinization of coastal groundwater, as well as changes in marine biodiversity;
- potential changes in surface and groundwater quantities;
- significant changes/losses in terrestrial and freshwater biodiversity in the Vjosa Basin;
- increased urban flooding due to more frequent, intense, and unexpected rainstorms, such as the one that occurred in Vlorë in April 2024;
- more severe flooding in the lower reaches of the Vjosa River; etc.

The economic consequences of this chain of environmental changes are related to reduced yields of certain cereal crops, such as wheat, increased exposure of agricultural crops to climate stresses such as higher risks from pests and diseases, pollution from tropospheric ozone, and heat stress, as well as increased health costs and expenses for natural emergencies, etc.

Report No. 6 of the Assessment, or Assessment Report 6 (AR6), of the IPCC (the UN's scientific body that reflects the conclusions of scientific research from experts around the world working in the field of climate), published in 2022, is the most reliable primary source of data on climate change. It is also the First Assessment Report on the Mediterranean, published by UNEP in 2022.

The legal framework, National Strategy, and Action Plan of the Republic of Albania, developed in 2022, are in line with all international policies following the Paris Agreement of 2015, and specifically with the EU's climate change policies, updated with the European Green Deal of 2020. The UN, through the IPCC, as well as the EU, have two active strategies for combating climate change: mitigation and adaptation.

The climate change mitigation strategy aims to keep the global average temperature increase to no more than +2°C, while it has already risen by +1.35°C compared to the pre-industrial period. To achieve this, the amount of greenhouse gas emissions released into the atmosphere by each country must be reduced.
Measures to accomplish this include: protecting natural areas, increasing the use of solar energy, improving energy efficiency in buildings through thermal insulation, overall energy conservation, promoting public transport over private transport, encouraging alternative transport modes instead of those using fossil fuels (e.g., gasoline), phasing out energy production from coal/oil/gas power plants, minimizing energy production from reservoir-based hydropower plants due to significant environmental and ecological impacts, reducing the ecological footprint of sectors such as agriculture, industry, and tourism, protecting wetlands because they have high biodiversity and absorb large amounts of carbon dioxide, ending deforestation, increasing forest areas or sustainable forest management, increasing the consumption of local agricultural products and avoiding products from distant areas due to their high ecological footprint, reducing the consumption of livestock products such as meat in tourist menus due to the high ecological footprint of livestock, and promoting agricultural products such as vegetables.

These measures for Albania are detailed at the central level by the government in the INDC document that the country has submitted to the UN.

The second strategy, adaptation to climate change, is based on the conclusion that 'climate change is occurring, and consequently, we need to adapt to it,' which involves altering many elements of our way of life, infrastructure construction practices, and management methods.

More can and should be done in this regard, such as increasing measures to make the cities in the Vjosa Basin more resilient to floodwaters by avoiding flooding, making agricultural flood-prone areas more resilient by avoiding certain crops, enhancing shading and cooling water surfaces in cities to adapt to heatwaves, and maintaining natural meanders in riverbeds that flow through cities to mitigate river flow speed, among other actions.

Adaptation is particularly challenging to understand, accept, and implement because it involves fundamental changes in lifestyle, planning systems, infrastructure, administrative and technical procedures, and construction practices. Therefore, it requires more attention, ongoing professional training, information dissemination, and well-thought-out communication processes.

Currently, Albania has a National Adaptation Plan and is detailing local adaptation plans for climate change, which is a legally vital element. The National Adaptation Plan is under review, and draft plans have been prepared for 8 municipalities in the Vjosa Basin. The adaptation plans for Vlora, Fier, and Permet are being finalized. Adaptation plans need to be implemented for all municipalities in the Vjosa Basin, and it is more appropriate if the local plan currently being developed is designed within the context of the Vjosa Basin (UNDP, 2020).

7.1 Introduction

Climate change represents the greatest non-military threat humanity has ever faced. This threat has the capacity to challenge all natural and social systems upon which human existence as a natural species and as a social being is based.

The UN has two active strategies to fight climate change: mitigation and adaptation. In 2015, the UN activated the Paris Agreement, which aims to mitigate, i.e., to limit the increase in global average temperature to no more than +2ºC compared to the pre-industrial period, while it has currently risen by +1.35ºC. To achieve this, all signatory countries have submitted the INDC, commitment document) which formalizes each country's contribution to reducing greenhouse gas emissions by 2030. Albania's initial commitment was to reduce greenhouse gases by 11.5% by 2030 compared to 2009 levels. The revision of this commitment has increased Albania's target to 20% by 2030.

At the same time, the UN has globally recommended the drafting of the national strategies of adaptation to climate change, which aim to modify human social and economic systems, making them resilient to adapt to the ongoing climate changes. In this regard, more can and should be done, especially in increasing measures to adapt to rapid flooding caused by heavy rainfall. The Vjosa National Park has the potential to positively impact this commitment, adding additional value and new quality.

Protected areas help mitigate the negative impacts of land use changes, which contribute to the increase of greenhouse gases in the atmosphere. They also prevent biodiversity loss, which is a consequence of negative land use changes. Climate change threatens the economic existence of local communities in the Vjosa River Basin. While implementing the principles of effective protected area management and maintaining the Vjosa River in its natural state inherently supports climate change mitigation, adaptation to climate change requires planning and implementing changes in the functioning of the economic and social life of the communities.

Climate change has complex consequences. It is not just about the increase in global average temperature but also the entire chain of natural, social, and economic impacts associated with it. The 'AR6' - Assessment Report 6 by the IPCC, published in 2022, is the most reliable source of data on climate change. This report highlights that in the terrestrial ecosystems of the Mediterranean region, which are highly reliable in terms of climate change impacts, the consequences include changes in ecosystem structure, species migration towards the north or higher altitudes, and alterations in phenological phases.

The report emphasizes that data on the impact of climate change on freshwater ecosystems, such as the Vjosa River, are insufficient to draw definitive conclusions. The same report indicates that, with high reliability in connection with climate change, there are negative impacts on human systems in the Mediterranean region, particularly on food production capacities related to water availability limitations, declines in livestock health and productivity, and productivity in fisheries or aquaculture resources.

Damage to key economic sectors is moderately reliable in connection with climate change. A decline in economic productivity related to livestock and agriculture would push the community either towards emigration or increasing the impact on the region's natural resources, which would pose a long-term threat to the quality of the region's natural ecosystems. This makes it urgent to identify and activate an action plan for adaptation to climate change for the economic activities of the communities.

The aim of this report is to help the national institutions on how to build a scientific based strategic document for the sustainable management of the water resources of the Vjosa basin, which is crucial for the sustainable management of the National Park of Vjosa and provide for effective adaptation and mitigation of the climate change impacts.

7.2 Climate change

7.2.1 Methodology

To compile this report, several methods were used through which various elements were analyzed.

1. The current state of climate change across the Vjosa River Basin, including of course the river's mouth, and the consequences so far.
2. Forecasts for climate change trends up to the years 2030 and 2050, and the corresponding consequences.
3. Perceptions of stakeholders regarding the current level of climate change in various areas of the Vjosa River Basin, as well as the visible consequences on water availability and the increase in climate-related risks.
4. Analysis of deficiencies and identification of responses.

As a reference basis for data, the official national documents of the Republic of Albania were primarily used, which are a requirement under the Paris Agreement. Specifically, these are Albania's Fourth National Communication, the revised INDC, and the Climate Change Strategy and Action Plans 2019.

The technical data on climate change in the Vjosa River Basin area are based on the IPCC's Sixth Assessment Report, specifically AR6. Since this official technical document is the result of all scientific research on climate change conducted by scientists worldwide and considering that these studies are evaluated based on their reliability, the Assessment Report is the foundational document referenced by experts and decision-makers globally. The first Assessment Report from the IPCC was published in 1999, and fortunately, the AR6 report was gradually released by the UN throughout 2022, allowing us to access updated data and conclusions with high certainty and reliability. The sections are complemented with maps and graphics taken from Annex I of the AR6 report.

Since the entire territory of the Vjosa River Basin falls within the Mediterranean region, a highly valuable data source is also the report prepared by UNEP, published in November 2020, titled 'Climate and Environmental Change in the Mediterranean Basin – Current Situation and Risks for the Future. First Mediterranean Assessment Report.' Additionally, all laws, strategies, and other legal acts on climate change have been analyzed at the European Union level, regional level, and national level.

The collection of data on the perception of climate change and its connection to the daily life and future economic activities of the community was carried out through questionnaires answered by stakeholders in the Vjosa River Basin area.

The interpretation of these results concerning the issues addressed in the questionnaire has been included in the relevant sections of this report, such as changes in water quantity in local sources, changes in snowfall amounts, changes in snow cover in mountainous areas, and the relationship between climate change and the occurrence of floods, among others.

The report also includes a brief gap analysis, which considers all the weaknesses in the system concerning the measures to combat the climate change in the Vjosa River Basin. This gap analysis has been supplemented with the corresponding responses, which also cover all the component elements of the system.

The report begins with an SPM - Summary for Policymakers, which synthesizes the main elements of the entire issue, presented in a straightforward language suitable for any level of understanding of climate change issues.

7.2.2 Key Issues

7.2.2.1 *The Vjosa Park and its Potential Impact on the National GHG Inventory and the Achievement of the INDC Targets for Albania*

The "National Inventory of Greenhouse Gases (GHG) of Albania" analyzes the responsible sectors, some of which are influenced by and influence the existence and management of the Vjosa National Park: such sectors include 'energy' and 'AFOLU Agriculture, Forestry, and Other Land Use".

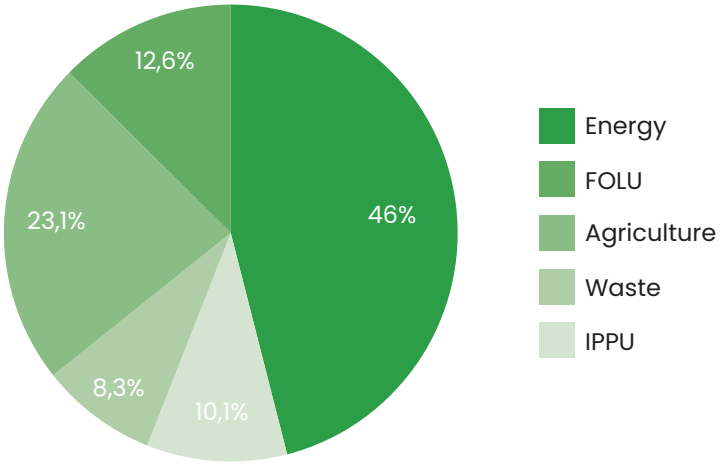

Figure 46: **The Contribution of Sectors to GHG Emissions in Albania**

Source: National Inventory of Greenhouse Gases (GHG) of Albania

Energy contributes approximately 46% of GHG emissions in Albania. The INDC scenario for the energy sector is based on the NDC scenario, also known as the combined strategy, calibrated with actual quantitative data based on the years 2015-2019. The NDC scenario considers several elements together, some of which have a direct link to climate change and actions against it: increasing the use of natural gas to reach a target of 8-10% by 2030, improving energy efficiency by 15% by 2030, and increasing the use of renewable energy sources to achieve a 42.5% share by 2030 (National Inventory of GHG of Albania).

The suspension of the construction of hydropower plants (HPPs) in the Vjosa Park territory will have a contradictory impact in this regard, depending on the long-term or short-term perspective, and on the consideration of the impact on the 'energy' sector or the 'AFOLU' sector in terms of GHG emissions.

From the short-term perspective, the construction of hydropower plants could have a positive impact on achieving the 42.5% target for renewable energy by 2030, which is a positive contributor to reducing GHG emissions because it decreases the consumption of electricity from imports, which primarily originates from fossil fuels in our neighboring countries.

However, from a medium- and long-term perspective, a well-managed protected area sustainably reduces greenhouse gas emissions locally, thus ultimately offsetting the energy produced by hydropower. Additionally, preserving forested areas and other landscapes with water for potential HPP reservoirs eliminates the negative impacts of these reservoirs on land use, biodiversity loss, and coastal erosion. Consequently, this contributes to increased CO2 sequestration by forested areas, thereby playing a decisively positive role in the AFOLU sector of Albania's GHG inventory.

The contribution of the Vjosa Basin to the forecasts and targets of the INDC can also be related to energy efficiency and renewable energy. The increase in energy efficiency through the implementation of the NEEAP – National Energy Efficiency Action Plan, which envisions a 15% improvement in efficiency by 2030, is significant. The primary focus in this regard is residential consumption, which is managed based on the 'degree day' concept, allowing for a preliminary assessment of the annual thermal energy required for heating. The NEEAP and the Albanian Energy Code for Residences divide the national territory into several zones, according to some variables like for example the number of the residential consumers, residential consumption, etc. The Vjosa River Basin covers three zones outlined in this national zoning , specifically Zone 1 in the lower Vjosa basin, Zone 2 in the middle reaches of the Vjosa River Basin, and Zone 3 in the upper Vjosa River Basin. Since the main variable in the above calculations is the number of residential consumers, which increases with the decrease in the average number of people per household, driven by rising living standards and population aging, residential consumption in the Vjosa Basin could increase. This may lead to a higher carbon footprint in the area, and consequently, a response should be to intensify measures to improve energy efficiency, particularly focusing on thermal insulation in urban settlements in the upper reaches.

7.2.2.2 *The State of Climate Change in the Vjosa River Delta and the Risks*

The first Mediterranean Assessment Report has identified the Mediterranean as a 'climate change hotspot,' with a 20% higher temperature increase compared to the global average. This designation as a hotspot is based on several data points and facts.

Using the analogy method for the entire Mediterranean region, it can be confidently stated that this data is highly relevant for the Vjosa River delta area, including the Narta Lagoon as a product of sediment accumulation from the Vjosa during the Holocene.

Currently, the temperature increase in the Vjosa River delta area is +1.54°C, while the global average is +1.35°C. The forecast for 2040 at the global level is +2.2°C. This temperature increase has cascading consequences across the entire ecosystem and human systems. As a result, coastal areas face increased risks of disasters, including flooding and coastal erosion, as well as salinization of the Vjosa delta and associated aquifers, which support food security and the quality of life for local communities. These exposures are further exacerbated by plans to develop hotel structures in the area.

Currently, sea water temperature in this area has increased by +0.4°C, and the forecast up to 2100 is for an increase ranging from +1.8°C to +3.5°C (I-st Med AR), with hotspots of this increase in the Adriatic Sea and the entire eastern Mediterranean. This current increase, in addition to causing the displacement of alien species from southern regions towards the coastal area of the Vjosa delta, and consequently the northward migration of native species in the Adriatic, also leads to several other consequences.

Firstly, this leads to increased ocean acidification, with direct impacts on biodiversity and, subsequently, on the fishing and tourism industries. Currently, the pH of sea water has decreased by -0.1 compared to pre-industrial times, while the forecast for 2100 is a decrease of -0.4, which has the potential to result in changes affecting up to 80% of marine biodiversity in the Vjosa delta (I-st Med AR),.

Secondly, the increase of 1.54°C in global air temperature and the rise in sea water temperature have led to a rise in sea level, also due to the additional effect of thermal expansion. According to the First Mediterranean Assessment Report (2020), the sea level has risen by 2.8 mm per year over the past 30 years, resulting in an increase of 8.4 cm. Since the impacts of climate warming have started to manifest throughout the industrial period, though they have intensified in recent decades, the sea level has risen by about 16 cm over the past 100 years. The forecast is that the rate of sea level rise is accelerating, reaching 10–30 cm by 2050. This will lead to the salinization of groundwater in the coastal area. These changes will exert increased pressure on delicate ecosystems and on the economy and society. Particularly in the Vjosa River delta area, the impact is expected to be significant.

7.2.2.2 *Current and Future Changes in the Water Sector Caused by Climate Change and Their Associated Impacts*

The AR6 Report in its Annex I provides a wealth of synthesized data on climate change and its impacts on representative areas of the globe. In Figure AI.35 of this Annex, changes in water-related issues linked to climate change are analyzed in a synthesized manner, along with the resulting impacts on natural ecosystems and human systems. When discussing physical changes, the report's increase/decrease refers to changes in the amount or frequency of measured variables, while the level of confidence refers to the belief that the respective change has occurred in the manner described.

For the variable 'total precipitation,' it can be stated with full confidence that the trend will be decreasing for the Vjosa Basin. This is also confirmed by the First Mediterranean Assessment Report. The forecast for the quantitative aspect, with average confidence/security, is that the average annual precipitation will decrease by -10 to -15% under a +2°C temperature increase scenario compared to the pre-industrial period.

For the variables 'intense rainfall' and 'flooding due to rainfall', it is assessed with maximum confidence that there will be an increase. The First Mediterranean Assessment Report also estimates that intense rainfall will increase by 25%, while the occurrence of intense rainfall outside the summer season will increase by 30%.

For the variable 'cryosphere', specifically 'snow and ice cover,' current trends are assessed with high confidence as being 'in decline.' This means that 'snow-covered days' in mountainous areas have decreased, and snow cover can now only persist at higher elevations above sea level. This finding in the AR6 report is corroborated by the perceptions of stakeholders who responded to the questionnaire during the preparation of this Report as part of the 'ESPID4 Vjosa' project. Most respondents have expressed that they believe and perceive there is less snowfall than before and that snow cover in mountainous areas has been reduced.

Regarding the variable 'river flows and discharge from springs', the AR6 assesses with low confidence that it is currently in decline. This is another argument that calls for caution when it comes to the decision making for the project of the water outtakes from Shushica, due to the general impact on the discharges in the Vjosa river. Similarly, with low confidence, the forecast is also expected to show a decrease. There are two options for evaluating these findings.

Given the level of confidence assigned by AR6 to this conclusion, the first option might be that studies on this aspect are still incomplete, preventing a reliable conclusion. In the questionnaire conducted as part of our report with stakeholders across the Vjosa Basin, 60% of respondents expressed the belief that 'there is less discharge from the area's springs,' with some even stating that 'all springs have less water than before.' Examples given include 'Kroi i Daiut,' 'Hamit Muco' spring, Uji i Zi, Ujëvara e Sopotit, and the springs of Nivica, among others, where the quantity is perceived to ,have decreased. This is an alarming signal that necessitates more structured monitoring of their liquid discharge quantities.

The second option regarding the low confidence with which the AR6 report assesses the decline in spring discharge would be good news for the Vjosa Basin ecosystem, as well as for the economic systems connected to it. This option would suggest that the quantity of water in the tributaries and the main flow of the Vjosa River is more influenced by geological construction factors and the hydrogeological and geomorphological aspects of the basin than by climatic conditions and changes in them. The folded geological structures, specifically with a sequence of anticlines and synclines affected by longitudinal tectonics that have resulted in the overlap of the northeastern limbs over the southwestern limbs, establishing tectonic contact between water-permeable limestone layers and clay layers that act as a barrier to the emergence of groundwater, enable that generally in the southwestern slopes of the mountain ranges 'Trebeshinë – Dhëmbel – Nëmerckë' and 'Shëndëlli – Lunxhëri – Bureto,' the spring discharge quantities are not influenced or dependent on the decline in total precipitation or the reduction in the presence of the cryosphere.

For the variable 'floods from rivers/streams', which is different from 'flash floods', it is assessed that, with low confidence, it is currently in decline. While the forecast for the future also suggests a decline, this time with medium confidence. This assessment does not fully align with the evaluations of the respondents during the survey, where 50% perceive a connection between climate change and an increase in river floods.

For the variable 'droughts', both the current assessment and the forecast for the future are given with high confidence. Current trends indicate that droughts have increased in duration and frequency. The forecast for the future also shows an increase. This exposes agriculture, particularly in the lower sector of the Vjosa basin, to negative impacts. In the context of the survey conducted with stakeholders as part of the ESPID4 Vjosa project, the majority of respondents agree with the finding that 'droughts are more frequent than before across the entire Vjosa basin'.

"For the variable's 'groundwater' and 'soil erosion and sedimentation', there are no assessments of current trends. However, for the future, it can be said with low reliability that they will be negatively impacted. It is likely that the groundwater level will be affected but not fundamentally, considering the previously mentioned hydrogeological and geomorphological conditions. On the other hand, soil erosion and the amount of solid discharge in surface streams are likely to increase, given the trend of increasing precipitation in the form of downpours, the current level of surface exposure due to inherited deforestation, and the lithological conditions where flysch formations are widely present throughout the basin.

The water quality variable has not yet been assessed for either current trends or the future.

7.2.2.2 *Current and future changes related to terrestrial and freshwater ecosystems*

The AR6, in the Annex I, in Figure AI.07, observes changes in the distribution of plant functional types during the period 1700-2020 are presented. These changes in plant functional types are indicators of the alterations that have occurred in the function and structure of biomes.

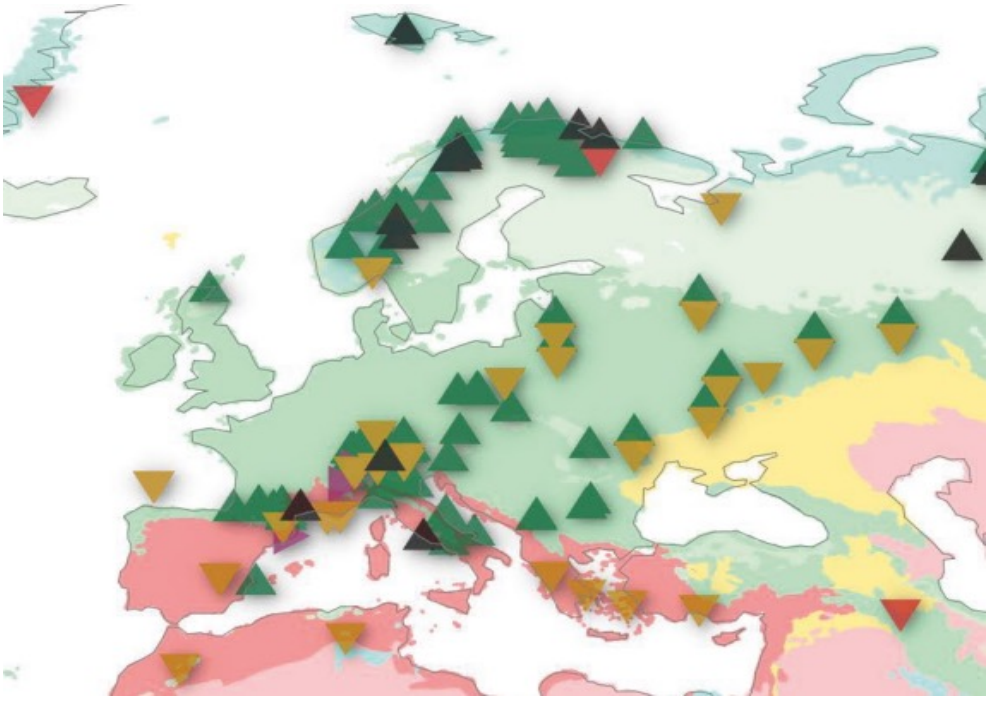

Figure 47: **Changes in the distribution of plant functional types during the period 1700-2020**

Source: AR6

According to these findings, there is a clear observation of a 'decline/reduction in forest cover' in the Vjosa River Basin during this period up to the year 2020.

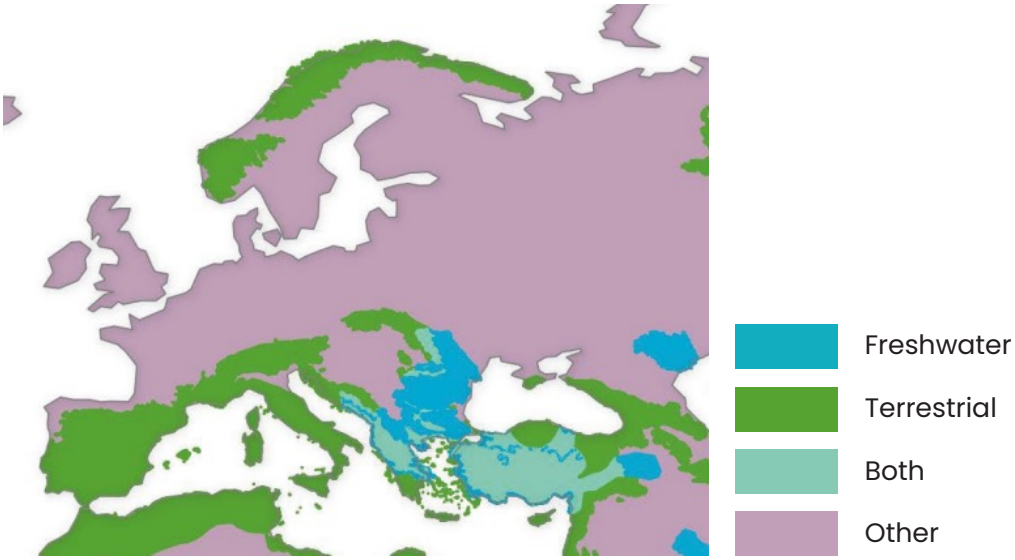

Figure 48: **High Conservation Importance Areas & the Number of People Associated with them**

Source: AR6

In the assessment regarding the number of people living in areas of high importance for protection, between 'areas with important terrestrial ecosystems' and 'areas with important freshwater ecosystems,' the Vjosa River Basin is classified as an 'area where both' types and importance overlap. Consequently, the IPCC, through AR6, considers the Vjosa River Basin to be among the 'priority areas for nature conservation,' based on AR6's argument that these areas contain a high number of species found nowhere else (endemic). Globally, such areas cover less than 1/7 of the Earth's surface, indicating their increased significance.

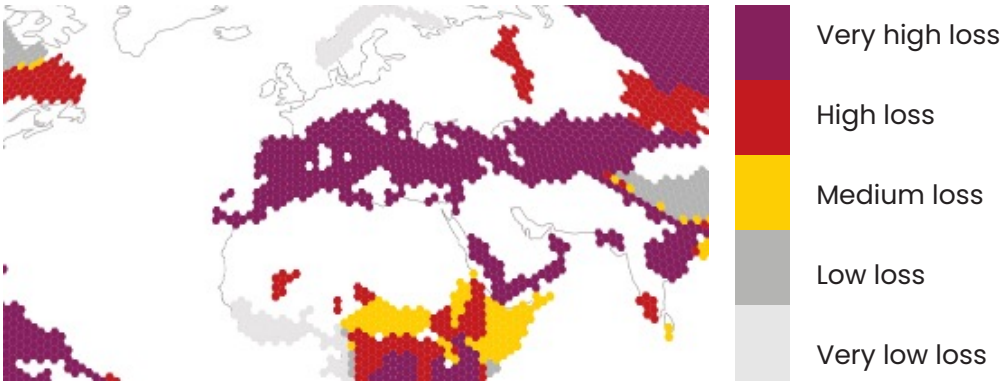

Figure 49: **Forecast of Habitat Loss under a Scenario of Global Temperature Increase of +1.5°C**

Source: AR6

This map presents and projected habitat losses of climatically suitable area in terrestrial biodiversity hotspots. Projected loss for present day (around 1°C warming) and at global warming levels of 1.5°C. The map shows the regional distribution of losses in five categories of loss (very low loss 0–20%, low loss 20–40%, medium loss 40–60%, high loss 60–80%, very high loss 80–100%).

In Annex I of WGII of AR6, the 'prediction for habitat loss in a scenario of a global temperature increase of +1.5 °C' is assessed, and it is estimated that for the Vjosa River Basin, this loss will be 'high,' specifically in the range of 60–80%. It is already known that the global average temperature has increased by +1.3 °C compared to the pre-industrial period, and the targeted level for temperature stabilization is 'no more than +2 °C.' This implies that a biodiversity loss of 60-80% is nearly inevitable for the Vjosa River Basin.

Figure 50: **Projected Losses in Biodiversity under a +1.5°C Global Temperature Increase**

Source: AR6

Colour shading represents proportion of species for which the climate is projected to become sufficiently unsuitable that the species becomes locally 'endangered' and at high risk of local extinction within a given pixel across their current distributions at a given GSAT warming level, based on underlying data (Warren et al., 2018). Areas shaded in deep orange and red represent a significant risk of biodiversity loss (areas where climates become sufficiently unsuitable that it renders >50% and >75% of species at high risk of becoming locally extinct, respectively). The maps of species richness remaining have been overlaid with a landcover layer (2015) from the European Space Agency (ESA) Climate Change Initiative. Areas with a landcover identified as agriculture are 5% transparent, such that the potential species richness remaining if the land had not been converted for agriculture shows as pale shading of the legend colours (very pale yellow to very pale red). These paler areas represent biodiversity loss due to habitat destruction, but with a potential to be restored, with yellow shading having the potential for restoration to greater species richness than orange or red shading.

The Living Planet Index Report 2024 clearly documented that freshwater species declined for approx. 70% since 1970. Furthermore, projections indicate that the risk of biodiversity loss in terrestrial ecosystems and freshwater ecosystems is high, with further losses ranging from 25-50% to 50-75%

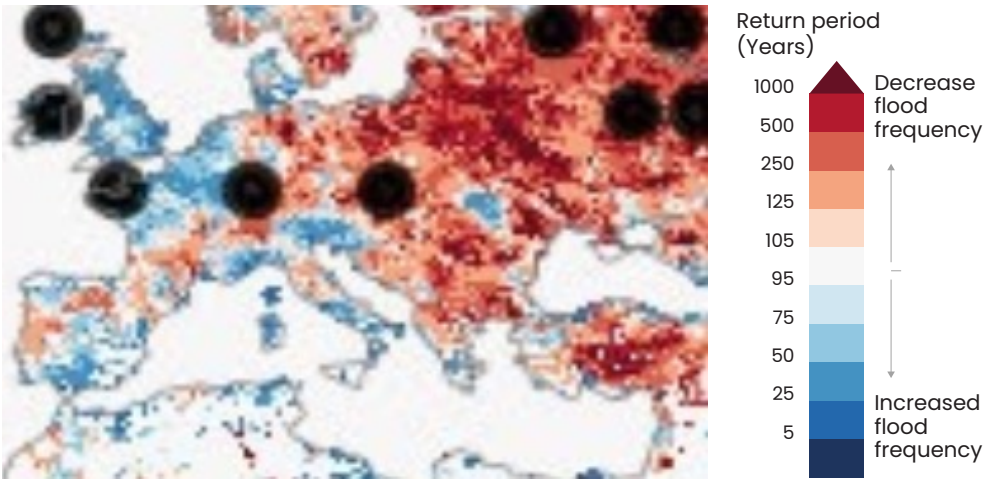

Figure 51: **Projected Changes in River Flooding for the Period 2071-2100 compared to 1970-2000**

Source: AR6

The refined model shows a decrease in the frequency of floods compared to an increase in their intensity.

Figure 52: **Historical Risk and Projected River Flooding & Exposure to It, Goldewijk et al., 2010, 2011**

Source: AR6

For the downstream section of the Vjosa River, the risk is assessed as very high, taking into account climate change and population density.

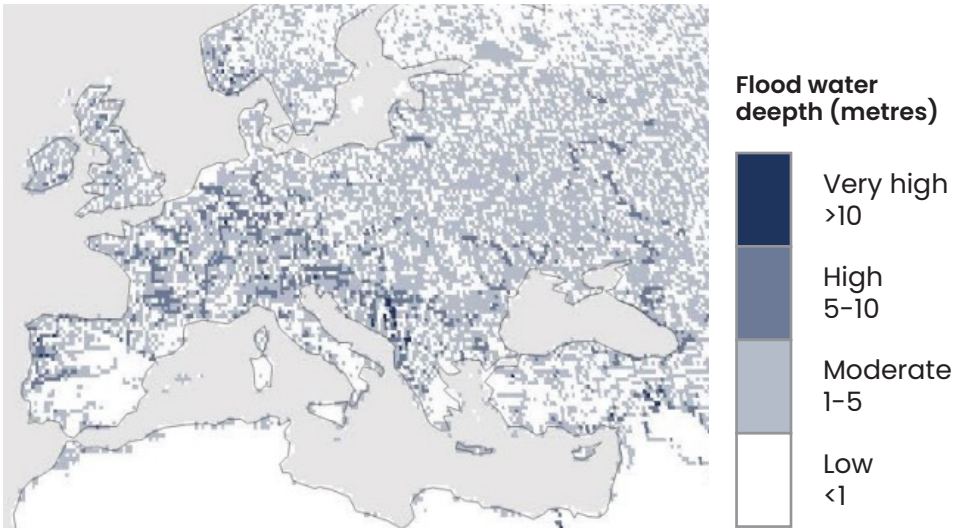

Figure 53: **Modeling of river flood depth (Tanoue et al., 2016, 2021)**

Source: AR6

The modeling results indicate that the predicted future depth will be high, ranging from 1 to 5 meters.

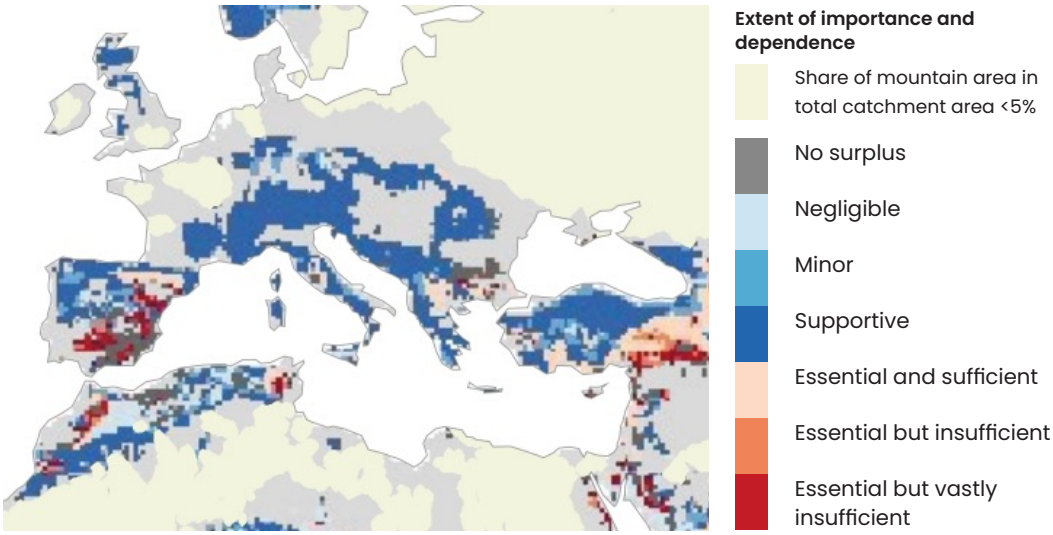

Figure 54: **Mountain areas importance for water resources of lower-lying areas for 2041-2050**

Source: AR6

In Annex I of AR6, the 'importance of mountain areas for the water resources of lower-lying areas' for the period 2041-2050, under the SSP2-RCP6.0 scenario for the Vjosa River Basin, is assessed. The connection between the mountain area (upper reach) and the water resources of the lower area (lower reach) is evaluated as 'supportive,' meaning that the role is not critical and that water resources are sufficient. This implies that the water resources of the upper reaches of the Vjosa River Basin can be managed autonomously, as there is no risk that the population in the lower reach of the Vjosa will suffer from water shortages.

7.2.2.3 *Analysis of the exposure of agriculture and livestock to climate stress*

In Annex I of AR6, the impacts of climate change on economies and agricultural crops are analyzed. Unexpected production losses in all production systems have been steadily increasing since the 1960s. The major causes of this increase are climate risks, including droughts, floods, and storms. Over the past 30 years, global agricultural production for major crops has decreased by 4-10%, and this can be attributed to climate change with high reliability.

In the Vjosa River Basin, it can be stated with high confidence that currently all cereal crops, including wheat and maize, are negatively affected in terms of productivity. For the near future, with high confidence, it can be said that under a scenario of a +2°C temperature increase, the negative impact will worsen for wheat crops, while for maize crops, the deterioration cannot yet be confirmed.

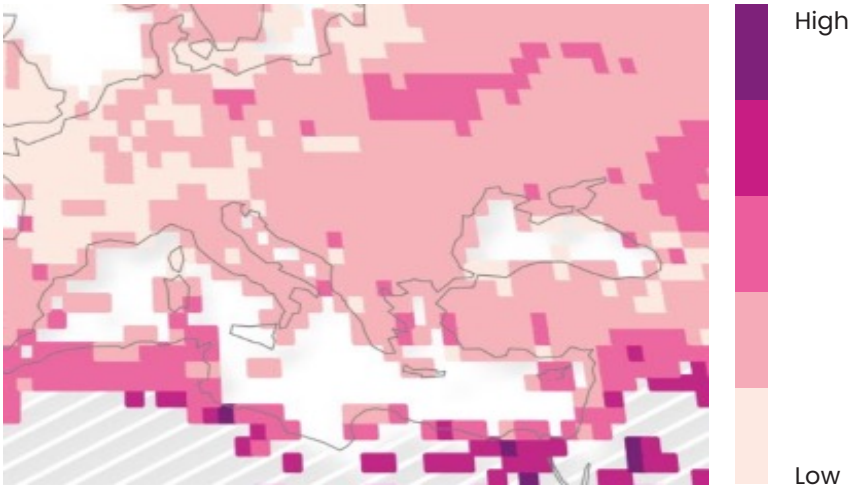

Figure 55: **Average exposure of wheat crops to five climate-related environmental stresses**

(drought, ozone, diseases and insects, heat stress, and soil nutrients) Source: AR6

In the analysis of wheat production exposure to the five main climate-related stresses, the overall risk is average. However, when examining the risks separately, it is observed that the risks of 'high' exposure in the Vjosa River Basin are presented by stresses such as 'diseases and insects,' 'ozone,' and 'heat stress.".

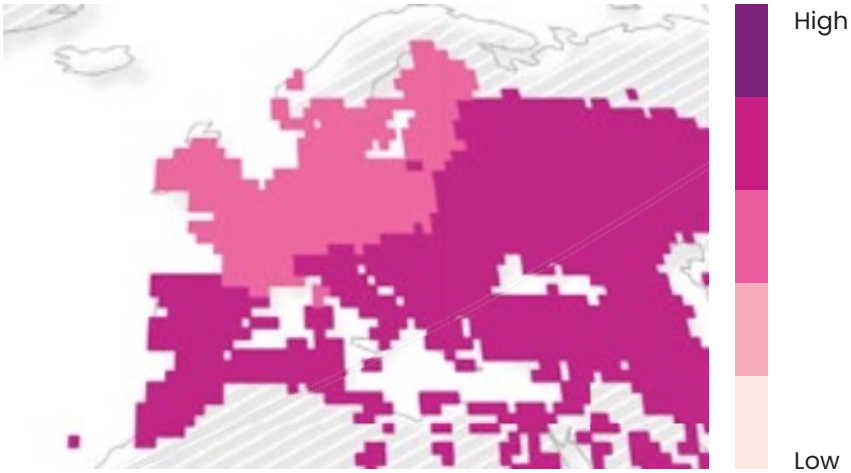

Figure 56: **Exposure of wheat crops to 'insects and diseases' stress exacerbated by climate change**

Source: AR6

The same situation applies to corn cultivation, where the highest exposure is to stress from "insects and diseases." It is known that climate change, the increase in average temperatures, and the rise in heat waves cause a global shift in the distribution of pathogenic factors and harmful insects toward the north. This means that in the northern Mediterranean, factors that were typical of the southern Mediterranean may naturally migrate.

Annex I of AR6 provides very important data on extreme climate-induced stress for various livestock species. The calculations have been made according to the THI – Temperature Humidity Index by Gilbert et al. 2018, and Thomson et al., 2021.

Figure 57: **The Number of Days in the Year When Livestock are Under Extreme Climate Stress**

Source: AR6

Figure 58: **The number of days per year when goats are under extreme climate stress**

Source: AR6

Figure 59: **The Number of Days in the Year When the Poultry Sector is Under Extreme Climate Stress**

Source: AR6

Figure 60: **The Number of Days in the Year When Young Animals are Under Extreme Climate Stress**

Source: AR6

In the analysis of extreme stress for livestock, marked by temperature and humidity, it appears that actually the number of days per year when cattle might be under extreme stress in the Vjosa River Basin is 0 days. This means that the livestock sector, particularly cattle farming, can be considered as having the greatest certainty for practice under climate change conditions in the Vjosa River Basin area. But the forecast for the end of the 21st century is that the number of days with extreme stres, marked by temperature and humidity, will increase and this will cause economic losses.

Similarly, for livestock, the number of days with extreme climate stress regarding temperature and humidity also results in 0 days but the forecast for the end of the 21st century is that the number of days with extreme stres, marked by temperature and humidity, will increase and this will cause economic losses.

Similarly, the data is optimistic for the poultry sector, as in this case, the number of days per year when the poultry sector is under extreme climate stress: 0 days

The same data has been processed in Annex I of AR6 for pigs as well, and the result is favorable for the Vjosa River Basin.

The risk or the probability that a threat will cause damage is the combination and average of three variables: the natural threat, the level of exposure, and the level of vulnerability.

Figure 61: **The variables of the risk**

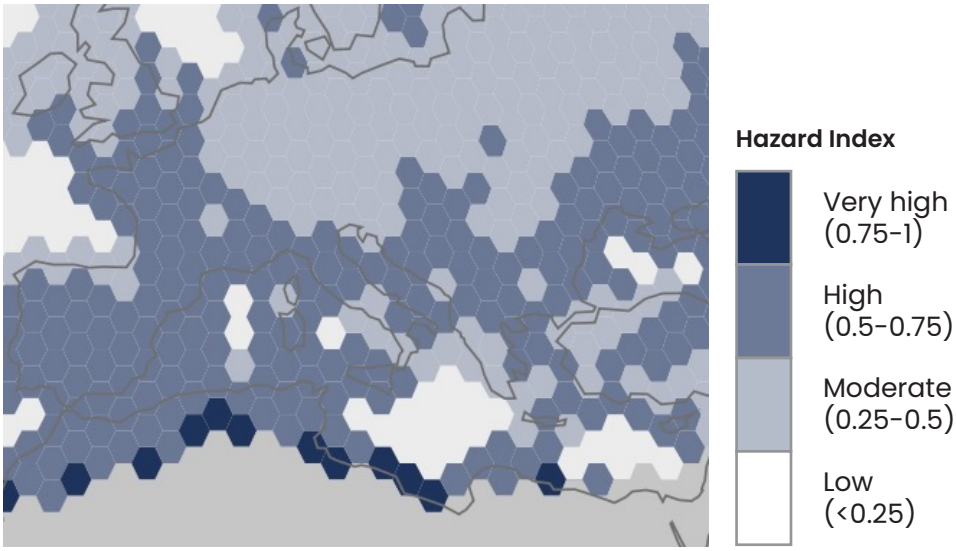

Figure 62: **The Current Level of Drought Threat**

Source: AR6

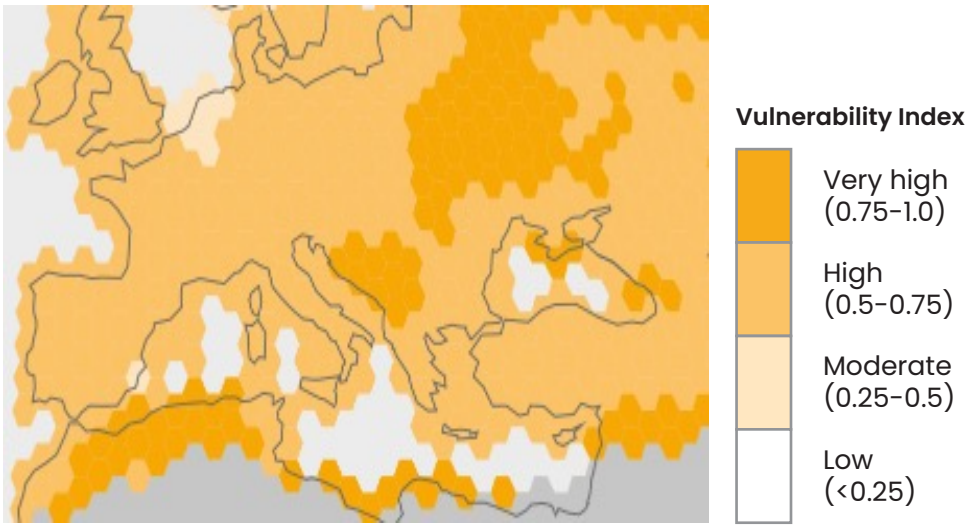

Figure 63: **The Current Level of Drought Threat**

Source: AR6

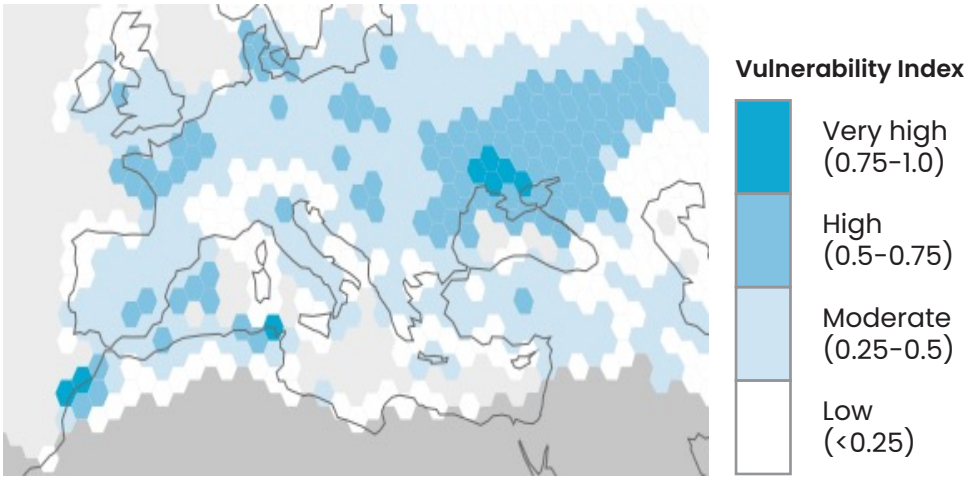

Figure 64: **The Level of Exposure to Drought**

Source: AR6

- The current level of drought threat is considered "average" for the Vjosa River Basin area.
- Regarding the level of threat, it is considered average.
- The level of vulnerability to drought for the Vjosa River Basin is considered to be high.

Vulnerability to drought results from a mathematical model that combines social, economic, and infrastructural factors proposed by UNISDR in 2004. For the Vjosa River Basin, it is high due to the lack of adaptability of the infrastructure, which supports social life and economic activities, to climate change.

- The level of exposure to drought in the Vjosa River Basin: average

According to the AR6 conclusions, the level of exposure to drought in the Vjosa River is low to moderate. This is primary due to the morphographic features of the area and to the proximity to the sea. The climate of the area of the basin is typical mediterranean: the precipitations concentrated mostly during the cold half of the year.

7.2.2.4 *Types of adaptive responses and opportunities for success*

Adaptive measures are among the most difficult to understand and accept by national and local administrators and elected officials because these measures require and imply disrupting inertia and changing the "status quo." A clear example of this difficulty in accepting adaptive measures is the catastrophic flooding that occurred in Dubai in April 2024, where the consequences were unprecedented for the region, precisely because the city had not adapted to the new, unknown conditions of climate change and had not considered the possibility that intense rainfall of that magnitude could occur.

The same mentality of "this event has never happened before, so it cannot happen here" generally hinders climate adaptation measures and forces us to face consequences in terms of human life, health, or economic impact. This situation varies for different events across all cities in the Vjosa River Basin. To succeed in adaptation, it must be understood that "any event that was unlikely to occur before may now occur due to climate change."

Figure 65: **The most successful types of adaptive responses at the global level**

Source: AR6

The Figure 65 is based on the Figure AI.52 of Annex I of WGII of AR6, which analyzes the most successful types of adaptive responses at the global level, these responses are classified into four categories:

1. Technological/infrastructural
2. Institutional
3. Behavioral (cultural)
4. Nature-based

Analyzed based on these categories, and diversified by different continents, the statistics show that the most successful type of adaptation instruments in Europe have been "technological/infrastructural", with a success rate of 73%, followed by "cultural and behavioral" measures at 58%, and "institutional" measures at 53%.

This distinguishes Europe from all other regions of the world, where the most successful adaptive interventions appear to be those based on "cultural and behavioral approaches".

Consequently, in the Vjosa River Basin area, adaptive interventions will need to be primarily of the technological/infrastructural type, whereas nature-based adaptation interventions, which are most successful in Africa and South America, are unlikely to succeed in Europe.

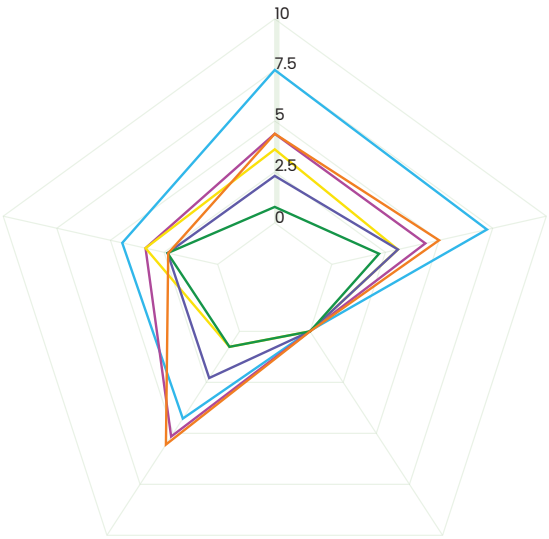

Figure 66:

The success of the adaptive measures in Europe

Source: AR6

In the graph 4, the adaptive measures for each area are based on 5 categories, and throughout the European region, the greatest results and benefits are seen in the three categories of "institutional", "ecological", and "water management".

In Annex I of WGII of AR6, the obstacles to achieving climate change adaptation are also assessed by region and sector. In the Vjosa River Basin area, within the sector of successful management of terrestrial ecosystems and freshwater resources, the primary obstacle is related to "information, awareness, and technology." This is defined as a "lack of awareness and access to information and technology for the population and decision-makers."

While secondary obstacles include:

1. Social/cultural obstacles, which refer to social norms, identity, attachment to place, beliefs, worldviews, values, awareness, education, social justice, and social support.
2. Governance, institutions, and policies, which include existing laws, regulations, procedural requirements, the goals of governance, effectiveness, institutional arrangements, adaptive capacities, and absorptive capacities.
3. Financial obstacles, which refer to the lack of financial resources. -Physical obstacles, which refer to the presence of physical barriers.
4. What about awareness?

Similarly, in the Vjosa River Basin area, when analyzing the obstacles to successful adaptation in the "well-being and communities" sector, the primary obstacle is "governance, institutions, and policies," which includes existing laws, regulations, procedural requirements, the goals of governance, effectiveness, institutional arrangements, adaptive capacities, and absorptive capacities. While, when analyzing the obstacles to achieving adaptation to climate change in the sector of "poverty, livelihoods, and sustainable development," the primary obstacles are "governance, institutions, and policies" and "information, awareness, and technology."

7.3 Legal and Policy Framework

This Report is based on the official documents of the Republic of Albania, which has aligned its legislative and regulatory framework on environmental aspects with the policies of the European Union.

The Government of the Republic of Albania signed the Paris Agreement on April 22, 2016, in New York. Subsequently, Albania submitted the official INDC (Intended Nationally Determined Contribution) document to the UN, with commitments to reduce GHG emissions by 11.5% by 2030 compared to 2011 levels. In line with these commitments, Albania has the "National Strategy on Climate Change & Action Plan" (NSCC&AP) as the primary strategic document aimed at strengthening coordination among sectors concerning mitigation and adaptation measures to climate change, environmental protection, and sustainable development. The NSCC&AP of Albania was developed in 2018 and approved in 2019 in accordance with and supporting the EU legislation of that time. However, the new European Commission, through the approval of the "Green Deal" on December 11, 2019, elevated European ambitions for the environment and climate to a new qualitative level. The Green Deal aims for Europe to become the first climate-neutral continent by 2050, meaning with net-zero carbon emissions. On October 6, 2021, the EU adopted the "Green Deal for the Western Balkans" at the "European Union & Western Balkans" Summit in Sofia, representing a new level of national commitment also for Albania.

In September 2022, Albania prepared and submitted the Fourth National Communication, fulfilling the obligation under Article 12 of the Convention, which stipulates that members of the UNFCCC (United Nations Framework Convention on Climate Change) and all key decision-makers and stakeholders must be informed about the state of climate change trends in Albania and their respective impacts. The Communication also presents an updated inventory of GHGs for the country and describes Albania's capacity to contribute to climate change mitigation and adaptation. This document provides a brief yet comprehensive overview of the measures taken, fulfilled, or planned by the Government, the general public, the business community, and donors, aimed at addressing climate change issues. In this context, the Fourth National Communication prominently features the case study of the "Vjosa Valley," likely due to its serious study by various authors, including with regard to climate change and its impacts.

The alignment of the objective of this report with the legal framework and national policies is specified in Sectoral Pillar No. 4 of the national policies, which is also reiterated in Albania's Fourth National Communication: "Growth through the sustainable use of natural resources and territorial development~.

As part of the adaptive measures to climate change, Albania has developed and approved the NAP – National Action Plan for Adaptation. Following this national plan, the central institution responsible, the Ministry of Tourism and Environment, is coordinating the work on the development of LAP – Local Action Plans. It would be beneficial if a single local adaptation plan were developed for the entire Vjosa River Basin.

7.4 GAP Analysis

In this chapter, we will address the issues of deficiencies and challenges identified for the Vjosa River Basin related to climate change. The discussion will begin with issues related to monitoring, education, public administration, business, water management, etc.

1. There is a lack of data resulting from insufficient monitoring of natural elements that impact and/or are impacted by climate change. One of the elements that should be scientifically monitored is the flow of water sources, which, according to conducted surveys, show lower water quantities as a result of climate change impacts. The same applies to snow cover and forest cover, which, according to AR6 data, is continuously declining and is expected to continue decreasing in the near future.

2. From the survey conducted as part of this project, it is evident that there is a deficiency in environmental education regarding climate change issues in general. This situation has a very simple reason: firstly, education on climate change is a relatively new field of study and action worldwide. Secondly, despite this fact, climate change has not been included, and even now is not included, in university programs in Albania, due to the inertia of university curricula. For these two reasons, entire generations of experts and administrators, especially those from local administrations or even decentralized national agencies, including recent graduates, have not had any teaching credits related to climate change. This results, for example, in local administration being generally climate-skeptical, and consequently, either remaining indifferent or becoming an obstacle to addressing this issue in their local policies. Furthermore, this leads to the prevalence of several myths regarding climate change that not only do not align with the truth but also hinder understanding of the issue. Such myths include opinions and prejudices like: "climate change is a huge scam by developed countries to sell their technologies," "climate change is always a future issue, not a present one", "climate change is a global issue and we cannot do anything about it", "addressing climate change is a luxury given the condition of our area", "addressing climate change is expensive and has no benefits", "what we do or can do has no role in climate change", "if the climate changes, we have nothing we can do", etc. Proper understanding of climate change is very important as it constitutes the fundamental premise for the success or failure of any policy undertaken.

3. There is a lack of knowledge, particularly regarding what adaptation to climate change entails. Local administration does not recognize the two pillars of climate action: mitigation and adaptation, and consequently does not understand the methods of action for each of them or the benefits for local communities if they invest in the green economy, renewable energy, and adaptation to climate change.

4 There is a lack of communication with the public regarding climate change. Public participation in addressing environmental issues is a prerequisite for the success of relevant policies. The public needs to be informed correctly and accurately, with the aim of being activated and contributing to the fight against climate change and to adapting to it.

5 There are deficiencies in national legislation and strategic documents. This stems from the fact that, even at the national level, climate change is viewed as a non-priority environmental issue. Adaptation methods require new implementations, which, in turn, are impossible without an update of public procurement procedures and without a flexible change in their technical criteria.

6 There is a mismatch between legal obligations and strategic acts on the one hand, and sectoral and cross-sectoral strategies on the other. The latter, even in their implementation at the local level, should intertwine the need to combat climate change and the preparation to adapt to it.

7 At the national level, we now have a strategy and action plan for both mitigation and adaptation to climate change. This strategy is being detailed with local plans as well. The current lack of a local action plan related to mitigation and adaptation to climate change causes local administrations, at best, to leave climate change issues at a voluntary level, or at worst, to not address them at all. Maybe several local plans would be a better strategy for success.

8 The local action plan does not operate based on addressing the needs of the entire Vjosa River Basin.

9 There is a lack of financial instruments such as incentives, etc., that would encourage entrepreneurs to undertake measures for increasing efficiency and boosting the use of renewable energy, particularly solar energy.

10 The inertia of the public administration fundamentally hinders any necessary changes for progress, especially in the area of adapting to climate change. This inertia is quite evident at the national level, but the local level of government is the one that needs to implement all measures and should be the most up to date with adaptation methodologies for climate change. Especially when it comes to adaptation, this is an entirely new field that began no earlier than 10-15 years ago, even for more advanced countries, which makes it impossible for the public administration to be well-acquainted with it. The inertia is also demonstrated by the example that the city of Tirana developed a Local Adaptation Plan for Climate Change in 2014-2015 under the expertise of GIZ, becoming one of the three capitals of the Western Balkans with such a plan (along with Belgrade and Podgorica), and this plan was even submitted to Brussels under the Covenant of Mayors, yet no element of its implementation has started.

11 Extreme climate events, such as heatwaves, are not addressed with the appropriate level of seriousness by local structures and emergency services. Consequently, climate change also receives little attention.

12 There is a lack of communication with farmers and livestock keepers regarding the consequences of climate change and the effects it may have on the yields of specific crops as well as on livestock production. Proper information could prevent immediate losses in agricultural production, which could be a potential consequence in certain years. It is important for farmers to understand that, for the Vjosa area, livestock farming and vegetable cultivation are more resilient to climate change compared to grain crops, particularly wheat.

13 There is a lack of awareness that an efficient adaptation strategy could involve changing the economic structure of the Basin to avoid high-risk sectors such as grain production and to more systematically explore the tertiary sector combined with livestock production, such as agritourism based on local organic products.

14 There is a lack of understanding of the consequences of climate change in the Vjosa Delta, or an ignoring of this reality. This may also be influenced by the immediate high economic interests associated with that subregion of the Vjosa Basin, such as the delta and the entire environmental system up to the Narta Lagoon.

15 There is a lack of understanding that the increase in flooding in the lower reaches of the Vjosa River requires adaptation, and not just mitigation or prevention through reinforced embankments.

7.5 Responses

In this section, we will address the necessary responses to address the identified deficiencies and challenges for the Vjosa Basin related to climate change. The issues related to education, public administration, business, and water management will be discussed.

1. Building and Strengthening Monitoring. Monitoring in the field for natural elements that impact or are impacted by climate change needs to be reinforced. The flow of water sources should be monitored based on a representative selection that has the potential to draw general conclusions for all the lithological, tectonic, hydrogeological, and geomorphological realities of the Vjosa Basin. These elements determine the flow rates of the water sources in the area, and monitoring would determine whether and to what extent climate change is impacting these flows. The selection criteria are geological, morphological, and the monitoring should be conducted at methodically dispersed intervals throughout the year. Snow cover could be monitored using GIS and Remote Sensing technologies. Some departments at national universities have already developed these capabilities, and cooperation with them is feasible. Examples include the University of Tirana (Department of Geography), the Polytechnic University (Faculty of Geomatics), etc. Monitoring should also focus on the continuous assessment of the impacts of climate change on: i) terrestrial and aquatic ecosystems in the area; ii) forest cover at risk of reduction; iii) the hydrological cycle of surface water flows; iv) human social and economic systems, particularly in agricultural and livestock productivity;

2. Environmental Education Campaign on Climate Change. This would help clarify the myths surrounding climate change. A careful environmental education campaign should start in the schools of the pre-university system in the Vjosa area. This could be incorporated into the management plans for the Vjosa Park, along with other educational topics such as biodiversity, floods, ecotourism, energy, etc. Without an updated and aware local community of experts, no Strategy or Action Plan can succeed.

3. A Simple Manual of Mitigation and Adaptation Methods. Targeting local administration and local experts from various fields, it is essential to develop and publish a manual on climate change mitigation and adaptation methods, including their benefits. This should not be written in technical or "one-way" language, and therefore cannot be a copy of the National Strategy or the National or Local Action Plan, but rather conceptualized in a completely different format. For example, it should explain in simple terms why every euro invested in the green economy yields a return of 4 euros in the short and medium term.

4 A Climate Change-Oriented Public Communication Strategy is needed. It should be careful and understandable. No policy can be implemented "top down"; instead, it should have a "bottom up" approach for understanding and support. This would create a broad, well-informed, and accurately educated community, aiming to activate and contribute to the fight against climate change and adaptation efforts. To achieve this, municipal websites or their social media pages, local television, etc., could be used. Every solution should start with environmental education and therefore informing the community about the causes of changes in their agricultural and livestock productivity. Community awareness should focus on two pillars: i) the identified problems are related to global changes that require local solutions; ii) the solution is not to intensify the use of natural resources but to adapt to conditions through small changes. This awareness campaign would ensure community cooperation in protecting the environmental quality of the Vjosa protected area.

5 Updating Legislation and Strategic Acts at the National Level. This update should also address the need to revise public infrastructure criteria. For example, the capacity of stormwater drainage systems has until now been based on multi-year maximum precipitation, whereas this maximum was calculated under a different climate from the current one. Climate change has rendered previous calculations inadequate. Examples from the Vjosa area, from Albania, and even from around the world are numerous. Recent floods in Dubai demonstrated that calculations based on current climate data are insufficient and that technical parameters for urban infrastructure investments need urgent revision. For instance, a coefficient of 1.3 should be added to the multi-year maximum precipitation to ensure that water drainage installations are prepared for the surprises that climate change is making a reality. These technical changes need to be reflected not only in the National Strategy and Action Plans but also in the relevant technical manuals for the respective sectors.

6 There needs to be full alignment between the climate change strategy and sectoral and cross-sectoral strategies. Given the rapid pace of climate change, these latter strategies should be updated even before the expiration of their legal deadlines. This will require a detailed analysis to identify which sectoral and cross-sectoral strategies need swift and immediate updates, and to specifically suggest the necessary changes.

7 The rapid development of Local Action Plans for climate change adaptation is urgent. Climate change is advancing faster than the pace at which administrative adjustments to measures are made, which is a significant disadvantage for human systems. In this urgency for speed, it should be considered that developing Local Plans is only the first step, and then we must wait for the implementation by local administration, gradual enforcement, etc. This may lead to a situation where the impacts of climate change occur faster than we can adapt to them.

8 The local adaptation plan for the Vjosa Basin should be developed based on meeting the needs of the entire Vjosa Basin and should function for the whole Vjosa Basin, rather than on a municipality-by-municipality basis.

9 Local plans should also include financial instruments such as incentives, etc., to encourage entrepreneurs to undertake measures to improve efficiency and increase the use of renewable energy, especially solar energy. Additionally, incentives or tax reductions for private builders who voluntarily implement pervious concrete technology should be considered)

10 Continuous training of central and local administration is essential. The administration of protected areas, water management agencies, regional environmental agencies, and local government must be trained on climate change with a focus on the Vjosa Basin. These climate change issues should be as understandable to these experts as matters such as the need for sustainable economic development and environmental protection. If this gap is not addressed, success, particularly in adaptation, is difficult. This is a completely new field that has only started within the last 10-15 years even in more advanced countries, making it challenging for the public administration to be familiar with it.

11 Serious handling of extreme climate events regarding their immediate health consequences for the population: Heatwaves are treated with naivety, assuming that the population is accustomed to heat and knows how to protect itself, which is harmful.

12 Immediate implementation of adaptive measures for the increase in flash floods from intense rainfall is essential and should be applied across all cities in the Vjosë Basin, including Vlorë, Fier, Tepelenë, Memaliaj, Përmet, and Gjirokastër. Particularly, Vlorë and Gjirokastër, which suffer chronically from this phenomenon, should implement water-permeable concrete techniques in both public and private constructions for sidewalks and public pedestrian areas. Also, even they are not among the most succesful category of adaptation measures in Europe, nature-based solutions in all the area of the Vjosa basin could be tested and considered.

13 The development of adaptation measures specifically for the Vjosë river delta is essential, considering the lack of awareness among investors that climate change could threaten their future investments if these are conceived with the mistaken ideas that "the territory will remain unchanged" and that "any change has a post-factum technical solution".

14 Reconceptualizing adaptation measures in the lower reach of the Vjosa River is crucial. This could include modifying agricultural production structures and creating morphological conditions for a wider riverbed to mitigate the impacts of flooding.

15 Engaging with agricultural sector stakeholders to adapt to climate change is essential. This can include a gradual phase-out of crops that are highly vulnerable to climate change and a shift towards more resilient agricultural practices. Transitioning towards livestock farming, while ensuring it does not become the primary sector, can also be beneficial. Additionally, modifying the economic structure of communities by shifting from the primary sector towards the tertiary sector—particularly agro-tourism—can provide a safer economic pathway given the increasing protected status of the area and its lower susceptibility to reduced agricultural productivity due to climate change.

7.6 Conclusions and Recommendations

Climate change in the Vjosa Basin is part of global trends and aligns with the climate change patterns observed in the Mediterranean region, particularly within freshwater and riverine ecosystems. The consequences of climate change are already evident, including an increased risk of extreme weather events, changes in biodiversity, and impacts on economic sectors.

1. There are important forecasts indicating substantial biodiversity loss with a temperature increase of +1.5°C.

2. There are current and projected impacts in the Vjosa River delta that need to be addressed, making it essential to reconsider infrastructure interventions in this area.

3. There are data and perceptions suggesting that the volume of liquid inflows in the water sources of the area may be decreasing. However, this needs to be confirmed through monitoring.

4. There is a need to design environmental monitoring programs that include both karst spring waters and surface water flows.

5. There are anticipated consequences of increased exposure to flooding due to intense rainfall. This underscores the urgent need for immediate adaptive measures.

6. The potentials for enhancing energy efficiency and utilizing renewable solar energy in the Vjosa Basin are significant and should be encouraged and explored. Every new inititive must take into consideration that hydro-energy is not considered to be green energy, and every new Project on this field must be stopped.

7. The plans to build HPPs on the Vjosa basin are actually avoided, but a permanent and decisive ban for every kind of HPP, including the Small HPPs, is crucial to the success of the National Park of Vjosa. It is firmly recognised worldwide already that the hydro-energy is not “green energy”, since it causes negative impacts on land use, loss of biodiversity, coastal erosion, etc.

8. The AFOLU sector in GHG emissions in the Vjosa River Basin is negatively impacted, particularly by the increase in natural fire risks due to drought and the rise in heatwave events. To mitigate this negative impact, an early warning system should be installed through satellite monitoring, utilizing GIS technologies for data processing and forecasting.

9. There are impacts that need to be considered in the agricultural sector, such as in wheat production. Impacts on the livestock sector are currently minimal but may become more significant in the near future. Projects to uptake the water of Vjosa River Basin for utilisation on the tourism sector, etc, must be seriousely reconsidered and stopped.

10 Taking water from Vjosa river for irrigation should be allowed only to local farmers or union of farmers, but the quantity taken must be strictly calculated, controlled and monitored.

11 The creation and implementation of local strategic documents for both mitigation and, especially, adaptation to climate change need to be expedited

12 There is an urgent need to train and update local administration and experts on climate change, ensure effective public communication about climate change and adaptation methods, and implement community-focused climate environmental education.

13 Alternatives for changing the economic structure towards more flexible sectors, such as the tertiary tourism sector, should be considered. This involves focusing on a combination of traditional economic practices with modern visitor needs, such as decentralized and widespread agritourism models.

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List of abbreviations

1-st MED AR	First Assessment Report for the Mediterranean Area
ADA	Austrian Development Agency
AFOLU	Agriculture, Forestry and Other Land Uses
AKBN	National Agency of Natural Resources
AKEP	Electronic and Postal Communications Authority
AMBU	Agency for Water Resources Management
AR6	Assessment Report No. 6 of the IPCC
BAU	Business as Usual Scenario
BMPs	Best Management Practices
CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
CBT	Community-Based Tourism
CfD	Contracts for Difference
CMD	Council of Ministers Decision
CO2	Carbon Dioxide
COP15	2009 United Nations Biodiversity Conference
COP26	2021 United Nations Climate Change Conference
DSO	Distribution System Operator
EBRD	European Bank for Reconstruction and Development
EDA	Economic Development Administration
EIA	Environmental Impact Assessment
ERA	Energy Regulatory Authority
ERP	Economic Reform Program
ESA	European Space Agency
EU	European Union
FEPA	Freshwater Ecosystem Priority Areas
FOLU	Forestry and Other Land Uses
FRM	Flood Risk Management
FRMSs	Flood Risk Management Strategies
GDP	Gross Domestic Product
GEN	Global Ecotourism Network
GHG	Greenhouse Gases
GI	Green Infrastructure
GIS	Geographic Information System
GLPCA	Green List of Protected and Conserved Areas
GNSP	General National Spatial Plan
GSAT	Global Surface Air Temperature Index
GW	Gigawatt
GWh	Gigawatt Hours

HEC/HPPs	Hydropower Plants
HT	Habitat type
ICFM	International Conference on Flood Management
IFRM	Integrated Flood Risk Management Framework
IMP	Integrated Management Plan
INCA	Institute for Nature Conservation in Albania
INSTAT	Institute of Statistics
IPCC	Intergovernmental Panel on Climate Change of the UN
INDC	Intended National Determined Contribution
IRENA	International Renewable Energy Agency
ISFD	International Symposium on Flood Defense
IUCN	International Union for Nature Conservation
IWRM	Integrated Water Resource Management
KE	European Commission
KESH	Albanian Electricity Corporation
KTOE	Kiloton of Oil Equivalent
LAG	Local Action Group
LAP	Local Action Plans
LID	Low-Impact Development
LIUDD	Low-Impact Urban Design and Development Programs
LUCF	Land-Use Change and Forestry
MFE	Ministry of Finance and Economy
MIE	Ministry of Infrastructure and Energy
MW	Megawatt
MWh	Megawatt Hour
NAP	National Action Plan for Adaptation to Climate Change
NAPA	The National Agency of Protected Areas
NBS	Nature-based solutions
NBO5/BOD	Biochemical Oxygen Demand
NDC	National Determined Contribution
NEA	National Environmental agency
NECP	National Energy and Climate Plan
NEEAP	National Energy Efficiency Action Plan
NES	National Energy Strategy 2018-2030
NKO	Chemical Oxygen Demand
NSCC & AP	National Strategy on Climate Change & Action Plan
NSDI	National Strategy for Development and Integration
NSDRR	National Strategy on Disaster Risk Reduction
NSSDT	National Strategy for Sustainable Development of Tourism
OECMs	Other Effective Area-Based Conservation Measures
OSHEE	Electricity Distribution Operator

OUV	Outstanding Universal Value
PA	Protected Areas
PoMs	Programmes of Measures
PPNEA	Protection and Preservation of Natural Environment in Albania
PUT	Polytechnic University of Tirana
RAPAs	Regional Agency for Protected Areas
RBMPs	River Basin Management Plans
RCP	Representative Concentration Pathways
SACs	Special Areas of Conservation SACs
SDGs	United Nations Sustainable Development Goals
SEA	Strategic Environmental Assessment
SECO	The State Secretariat for Economic Affairs
SHPP	Small Hydropower Plants
SKZHI	National Strategy for Development and Integration
SMEs	Small and Medium-sized Enterprises
SPA	Special Protection Areas
SPM	Summary for Policymakers
SSA	Stabilisation and Association Agreement
SSP	Shared Socioeconomic Pathways
SUDS	Sustainable Urban Drainage Systems
TOE	Ton of oil Equivalent
TPE	Total Primary Energy
TSI	Trophic State Index
TWh	Terawatt Hours
UDRR	Universal Declaration of River Rights
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	The United Nations Education, Scientific and Cultural Organization
UNISDR	United Nations International Strategy for Disaster Reduction
VOC	Volatile Organic Compound
VRB	Vjosa River Basin
VWRNP	Vjosa Wild River National Park
WB	Western Balkans
WFD	Water Framework Directive
WGII	Working Group II
WSUD	Water-Sensitive Urban Design

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